Agile Adoption in Public Agencies

A case study of identifying challenges in applying Agile within the Swedish Tax agency

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A case study of the Swedish Tax agency

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Införande av Agilt Arbetssätt inom Myndigheter
En fallstudie av Skatteverket

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Abstract
Citizens’ expectations of products and services produced by the public agencies are rising incredibly due to the fact that savvy startups and other global technology businesses have been succeeded in providing a high standard of digital services in the past decades. This, in turn, puts pressure on the public agencies in how they need to work in order to meet the citizens’ expectations and needs. Besides, during the years, there are a number of projects done by some of the agencies that has been identified as not having succeeded in delivering the desired value, staying in budget and delivering the project’s result in time. Therefore, there is a need for actions in order to counteract this. It is believed that applying Agile into the agency’s project management will help them to not only meet the citizens’ expectations, but also improve the project’s outcome. Many agencies have been hierarchical for a long time involving complex and rigid structure, and the fact that they have been working with a Waterfall-based methodology for a long time. Therefore, adopting this Agile approach implies a number of challenges for the agency. Thus, this thesis aims to investigate to what extent the Agile approach can be implemented into the agency by identifying the challenges that the adoption of Agile entails.

A number of different previous research and literature about the Waterfall, even called traditional in this thesis, and Agile project management methods have been reviewed in order to provide theoretical frameworks that are of relevance for this study. As the research subject is quite complex and broad, a qualitative approach has been utilized to obtain in-depth knowledge. Interviews have been conducted with employees from the investigated agency, and in order to pursue a comparison
with how other public agencies have worked with a potential Agile adoption, interviews have also been conducted with a second agency.

The thesis finds that applying the Agile project management method into the investigated agency will imply some challenges. A total of seven different challenges were identified which can be briefly summed up as following;

Employees being too comfortable with old methods; Staff has difficulty committing to the new working culture; Agile is not a “one-size-fits-all” method; Large size projects; Heavy documentation; Financial reporting practices affecting the efficiency of Agile planning; Lack of competencies or some competencies being considered rare, hence there is no guarantee for each team to have all competencies that are needed.

This study’s result shows that the studied public agency can work with Agile project management methods to a wider extent than what is done today. However, there are a couple of challenges, and solely working with the Agile method was showed to not be recommended. In order to find out if the Agile approach can be used in other works that are not covered in this study, or if the result can be applied to other sectors as well, further research is required.

Key-words: Project management, Agile, Waterfall, Agile adoption, Scrum, SAFe, public agency, government agency, public sectors.
Sammanfattning

Ett antal olika litteraturer samt tidigare forskningar inom Vattenfall, även kallat traditionell i denna rapport, och Agil projekthantering har granskats för att tillhandahålla den teoretiska biten om de olika arbetsmetoderna. I och med att detta undersökningsområde kan ses som relativt komplext och brett så har en kvalitativ undersökningsmetod använts för att få en djupare förståelse av området. Förutsättningarna av detta ges av intervjuer från anställda från den undersökta myndigheten. För att göra en jämförelse i hur andra myndigheter har arbetat med Agil införande har intervjuer även hållits med ytterligare en myndighet. Studien visar att tillämpning av Agil projekthantering inom
den undersökta myndigheten kan medföra en del utmaningar. Totalt identifierades sju olika utmaningar som är sammanfattade på följande sätt:

Anställda är för bekväma med den gamla arbetsmetoden; Anställda har svårigheter med den nya arbetsmiljön; Agil är inte en metod som är av “en storlek passar alla” principen; Stora projekt; Tung dokumentation; Redovisningspraxis som påverkas av den Agila planeringen; Avsaknad av kompetens eller att vissa kompetenser anses vara en bristvara.

Denna studie visar att den undersökta myndigheten kan arbeta med Agila projekthanteringsmetoder till en större utsträckning än vad som redan görs idag, däremot finns en del utmaningar, och att endast arbeta med den Agila metoden visar sig inte vara rekommenderat. För att veta om det Agila konceptet kan användas i större utsträckning även utanför projekthantering eller om resultatet även gäller för andra sektorer krävs vidare påbyggnad av studien.

Nyckelord: Projekthantering, Agil, Vattenfall, implementation av Agil, Scrum, SAFe, Myndighet, Offentliga sektorn.
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Foreword

We would like to thank our supervisor at the Swedish Tax agency (in Swedish: Skatteverket), Johan Schauman for being incredibly supportive throughout the whole process of conducting this thesis work and helping us to connect with other people within the agency. We are deeply grateful to all the interviewees from both the Swedish Tax agency and the Swedish Migration agency who took time out of their tight schedule to participate in our research and openly answered our questions.

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## Acronyms

<table>
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<th>Acronym</th>
<th>Description</th>
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<tr>
<td>ART</td>
<td>Agile Release Trains</td>
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<tr>
<td>DSDM</td>
<td>Dynamic Systems Development Method</td>
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<tr>
<td>KTH</td>
<td>Royal Institute of Technology</td>
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<td>PI</td>
<td>Program Increment</td>
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<td>PM³</td>
<td>På Maintenance Management Model</td>
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<tr>
<td>RUP</td>
<td>Rational Unified Process</td>
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<tr>
<td>SAFe</td>
<td>Scaled Agile Framework</td>
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<tr>
<td>XLPM</td>
<td>Excellence in Project Management</td>
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<td>XP</td>
<td>Extreme Programming</td>
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1. Introduction

This chapter aims to introduce the thesis by firstly presenting the background in section 1.1, which clarifies what is being researched and why. In section 1.2, 1.3, 1.4, the problematization, purpose, and research questions of the study are defined. Further, the context of the Swedish Tax agency and some past project shortcomings are articulated in the subsequent sections. Lastly, section 1.7 presents the delimitations and expected contributions of this thesis.

1.1 Background

The world is continuously changing due to, for instance, the evolution of digitalization, globalization, and higher demands coming from millennials. This, in turn, puts pressure on organizations in how they need to work in order to meet the market needs and requirements. In a fast-changing world it has become more common that organizations embrace concepts of continuous improvement and efficiency where they have accepted the challenge of thinking critically about how work is being performed, and by whom (Pack, 2018). The products or services delivered by organizations need to carry a value, where the value is built on how much the customers will be using the products and services. The more a product or a service corresponds to what the customers expect, the higher the value it carries, and which in turn enhances the organization’s competitiveness.

The process of creating and delivering a product, service or result is usually performed and executed through contemporary business, known as project, and may differ from one business to another. Different management methodologies have been used when dealing with projects and other development activities. The Waterfall, or even called the traditional project management, and Agile are, for example, two well-known methodologies that can be used for project work. Both Waterfall and Agile methodologies originated from, and have been widely used in software engineering (Stober and Hansmann, 2009; Lee and Xia, 2010). However, these methodologies have been introduced to other development processes within other areas as well over the past decades. Nevertheless, there are big differences between these two methodologies as they fit different types of projects. The Waterfall project methodology is a sequential and linear process of project management where the work stages are often pre-planned and can be illustrated as “eating a cake one layer at a time” (Belling, 2016). This means that work in the previous phase needs to be completed before the next phase can begin, and the final product or service is not released until the last phase of the project is finished. Therefore, it could take a long time until the product or service is experienced for the first time by the end-users. In the meantime, the term Agile has been around for at least one decade and originated in software engineering. It shares the same concept of Toyota’s lean manufacturing from the 1950’s which embraces the idea of continuous and iterative improvement and that is more or less what the Agile software development is about (Poppendieck and Poppendieck, 2003). In other words, Agile simply means that developers are being more flexible in their approach when dealing with projects and other development activities. The developers need to have the ability to adapt their project in real time when changes take place or
customer demands alter. The Agile methodology is based on iterative working and can be described as “eating vertical slices of the cake” (Belling, 2016). This indicates that there is an iterative work between all phases and a small part of the final product or service is cumulatively delivered which in turn has a higher tolerance for being able to embrace rapid changes or new demands that might occur during the project. Several Agile methods exist, such as Scrum, Extreme Programming (XP), Dynamic Systems Development Method (DSDM), Kanban, Lean Software Development, Rational Unified Process (RUP), etc. These Agile methods share much of the same philosophy of having easily alterable process which enables team to quickly respond to change (Davis, 2013). More on Waterfall and Agile-based project management can be found in chapter 2.

Both Waterfall and Agile methodologies can be performed, and are performed, by different organizations. However, it has become more common for organizations to migrate from the sequence-based process of project management to a more iterative workflow as they have realized adopting Agile methodology into their businesses might be the key to help them accelerating time to market, boosting customer experience, and improving product quality (Insights team, 2018). Another reason why the Waterfall methodology is no longer preferable, and many organizations want to migrate to Agile project management, is due to its non-iterative workflow which has a tendency of causing the end solution to become obsolete and irrelevant for the end-customer, and risking performing work that is not necessary (Gothelf, 2012). In contrast to the sequential process of Waterfall, Agile methodology is a better tool for responding to rapid changes, which results in a more accelerated time to market greater innovation, better customer experience, and improved product quality (Insights team, 2018). This is due to its iterative workflow where the final product or service is not predefined but instead defined during the project where additional or changed requirements can be taken into consideration even halfway through. An iterative workflow does likewise make the result more customer-centric and create higher transparency for a business as it enables incorporation with customer feedback early enough, and customer trust can be gained from the transparent process. However, when transforming from the traditional methodology to a more Agile project management method, the characteristics of projects that organizations are embracing are often insufficiently considered (Belling, 2016). Even if it has become common to migrate to an iterative framework, Belling (2016) demonstrated that the traditional process of Waterfall methodology is not outdated as different approaches fit different businesses. Therefore, many aspects need to be considered when embracing a new project management methodology. In addition, different types of projects possess different characteristics, and Agile is after all not a “one-size-fits-all” method, hence the difficulty to decide what kind of project the Agile methodology would actually benefit (Computer Sweden, 2013). Some might derive more benefits from the traditional method, and some might prosper by adopting the Agile method. Even a blend of traditional and Agile could benefit some particular businesses.

Despite the fact that the Agile methodology has been well received by privately owned organizations, the evolution of Agile is still not clear for public agencies even though they are also facing the same problems of a rapidly changing digital world. The citizens’ expectation on the public agencies’ products and services are rising sharply due to other big digital businesses, as well as small startups that have constantly been providing them with a high standard of digital services in real time. Therefore, a number of Swedish public agencies have been able to change their
mindset and began improving their work processes by embracing different Agile practices. For instance, the Swedish Migration agency (in Swedish: Migrationsverket) has worked with Agile methodologies to some degree and has quite recently decided to further expand the work with the Agile principles and to include more cross-functional team (DI Tema, 2019; CGI, 2018). Another example is the Swedish Tax agency (in Swedish: Skatteverket) who has decided to migrate from using the Waterfall-based work process within their project management to a more iterative and team-based work process (Lindström, 2017). In the Swedish Tax agency’s operational plan for the years 2018-2020, it is stated that they are striving to work more agile because of the higher rate of change that they are facing (Skatteverket, 2017). Besides, there is a recognizable pattern of shortcomings that have been identified from some of their past projects and which have led to a deterioration of the value of the project outcome and cost overruns. These shortcomings are described in greater detail in section 1.6. Thereupon, despite not having any competitor, it is considered crucial for the Swedish Tax agency to improve its way of managing projects. This will help them ensure success- and value creation of their projects.

1.2 Problematization

Traditional project management methodologies have been used by many public agencies under a long period of time. These methodologies such as the Waterfall are known to be useful and appropriate for large projects with clearly defined goals, stable project requirements, and a low rate of change during the project. In addition, as many other businesses and even small startups set a high standard for their digital services, the citizens’ expectations on services provided from public agencies are rising accordingly. Thus, changes tend to occur more frequently during the projects and therefore the sequential methods can no longer ascertain the impact goals being met at the end of each project and, besides, they contribute little to project outcomes. This, in turn, implies a risk of cost overruns and schedule delays.

In avoidance, some Swedish agencies have decided to embrace the Agile approach. However, concerning Agile has only been widely used in private organizations and especially in IT-projects, the application of Agile in public agencies will hence imply several challenges. Therefore, there is a need for defining a clear guidance of Agile adoption and identifying the challenges when applying Agile for public agencies.

1.3 Purpose

The purpose of this paper is to analyze to which extent Agile can be implemented within public agencies and identify the challenges when adopting Agile practices.

1.4 Research questions

This study attempts to answer the following questions

- To which extent can Agile project management be implemented in public agencies?
  - What are the challenges of applying Agile project management in public agencies?
1.5 The Swedish Tax agency

The Swedish Tax agency was selected to be investigated in this paper due to their suitability for this study. The Swedish Tax agency is a Swedish public agency that manages civil registration of private individuals and collects taxes such as personal income tax, corporate tax, and VAT (Skatteverket, 2019). A big data system is needed in order to perform all of the jobs mentioned. Hence, the Swedish Tax agency deals with a great number of IT-related projects. All of their work is financed by the taxes paid by the citizens which means that every project, and every work needs to be documented and reported with as much transparency as possible.

Besides working with different external private cases and administrations, the agency does also possess considerably many diverse development projects. The agency has been using hierarchical structure and Waterfall-based methods for such projects for many years which is now considered being too costly and time-consuming with no guarantee of reaching the desired value at the end of the projects; some of these projects are further displayed in the next section 1.6. The Swedish Tax agency consists of nine main departments, which are shown in Figure 1 below.

![Figure 1. The Swedish Tax agency’s organization chart (Skatteverket, 2019).](chart)

According to the agency’s organizational structure, the development unit is placed within the IT-department, which is not shown in the figure, and deals with questions related to development and management for the whole agency. One of their tasks is to deliver input to the IT-director, director-general and deputy director-general. Likewise, they support the management team in leading and controlling the development and coordination of the tax agency. Their main tasks also include giving strategic support to the management team and implementing the new Agile framework, the Scaled Agile Framework (SAFe), into their work processes as well as project management.

The development unit consists of five employees and they work across departments, which means that they do not only work within their unit, but they also cooperate with other departments within

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1 The chart has been freely translated by the authors.
the agency as well. This in order to ascertain that their inputs to the management team will be relevant and useful to the whole. For instance, the unit does often gather heads of all departments and units together in order to share dialogue and create a communal movement within the tax office. Likewise, the unit has close cooperation with the customer-relation department which is responsible for customer experience. Furthermore, the development unit is not responsible for the daily production. However, their task is to define the challenges on daily basis of the tax office, so as to determine what is needed to be improved, and how to develop and streamline their internal work processes (P4, Swedish Tax agency, 2019; P6, Swedish Tax agency, 2019).

1.6 Past project shortcomings

The Swedish Tax agency has had a number of projects running over the past years. Many of the projects have successfully delivered impact goals but some did not succeed in, for instance, delivering the desired value creation, staying within the budget, and/or delivering the result on time. Below are three projects presented that had some shortcomings and which led to the project budget, time and/or scope being deviated from what they had been planned. The three projects are:

- **KUPP** - The project is about replacing the outdated system that manages and controls the statements of earnings and tax deductions. The aim with the replacement is to make improvements and the system more effective were the new system should improve and increase the quality of the submitting information, with other words the submitted information should be right from the start. The new system would, in turn, also provide with a more streamlined working process at the Swedish Tax agency, and a more productive way of handling the incoming data from the submitters.

- **MUPP** - The project is about creating a new and more convenient way for employers to report the payments and tax deductions of each employee they have to the Swedish Tax agency every month.

- **IDAG** - This project is an adjustment of the previous project MUPP where its formation was not optimal, and the law was not approved. Despite the adjustment, this project has the same aim as the previous project.

Additionally, Scrum was more or less used in all three projects. However, some common shortcomings have been found from these three projects that could give an explanation to the deviation of the planned budget, time and/or scope. These shortcomings are as followed:

- Lack of communication between the projects’ members and sub-projects led to huge inefficiency and many concerns. Where for instance KUPP’s and MUPP’s project participants were from 3 different locations, and the project was divided into many sub-projects, which consequently caused miscommunication and the sub-projects ended up not being delivered on time. However, it is not necessarily the geographical division of the teams that was the main shortcoming for the projects, it could be due to them having different agendas.
● Problem with personnel and finding the right competencies. In some cases, insufficient
competencies were assigned to the project and in some other cases, personnel that got the
right competencies were lent out to other projects.
● The project’s time schedule was clear. However, it was challenging to meet the deadlines
which in turn led to running overtime.
● The projects were inattentive regarding the pilot study and analysis and jumped directly to
the IT development. This led to the loss of the overall perspective and the solution to not
coincide.

1.7 Delimitations and expected contributions

The investigation of this thesis is limited to be conducted within the Swedish public agencies with
a focus on the Swedish Tax agency, known as Skatteverket. As the Swedish Tax agency consists
of nine different departments that handle different activities, the study is further only delimited to
the development unit and project management within the agency, including both IT-related projects
and other development projects. As the public agencies are usually bounded by regulations, laws
and financial restrictions, it will be difficult for the researchers to consider all such aspects,
especially the financial restrictions due to its sensitivity. However, the outcome of this thesis will
be ensured that it does not exceed the restrictions of public agencies to the utmost. Further, data
collection has also been conducted from the Swedish Migration agency. This was done in order to
see how other agencies have managed the agile adoption and at the same time, make comparison
of the agile adoption between the two agencies to get a broader preference. No other than these two
agencies are involved in this research.

The investigation is further limited only to the methodologies that the Swedish Tax agency has
been used, is using and planning to implement in order to achieve a deeper analysis of these
methodologies. These are Waterfall process, Rational Unified Process (RUP), På Maintenance
Management Model (PM³), Pejl, Agile process, Scrum, and Scaled Agile Framework (SAFe).
Other forms that are alike the investigated methods will not be included in this study.

Even if this research has some limits, the analysis and conclusion of the report might be interesting
for other Swedish public agencies to read and search for new ideas due to their similar level of
organizational structure. Furthermore, there exists a vast number of blogs and articles that cover
the topics of Agile development within public agencies. However, in-depth studies about these
topics are found still rare. Therefore, this thesis aims to respond to this gap and try to make
contributions to public agencies by identifying the challenges that they might be facing when
applying Agile practices in their organization.

Summary of chapter 1

This chapter introduces the two different project management methods, the Waterfall development
method, and the Agile development method. Both methods have their pros and cons, and are
suitable for different types of businesses and project work. However, there is a trend where
organizations tend to migrate from Waterfall development to Agile development. Despite the Agile
development method has been widely used, there is still a gap when it comes to applying the method into government agencies and to a wider extent. This research has been delimited to investigate the Swedish Tax agency as it is currently going through an Agile transformation where the report aims to analyze to which extent Agile can be implemented. Further delimitations and the context of the Swedish Tax agency are also outlined in this chapter. Moreover, this research will add knowledge about the challenges that might arise when applying Agile practices to the Swedish government agencies.
2. Literature study

This chapter introduces the concepts related to the research area by reviewing literature within the field. The literature will later be used as a foundation to analyze the empirical studies. The main focus will be put on different traditional and Agile software development methods.

2.1 Traditional software development methods

There are many different methodologies that can be used when it comes to managing projects and other development activities. The traditional management methodology such as the Waterfall development method has its root from software development. It proceeds sequential development where each sequence has its intention. An illustration of the Waterfall development with its sequences are shown in Figure 2.

![Figure 2. An illustration of the Waterfall development with its implementation steps, the iterative relationship between the successive development phases is also shown (Royce, 1970).](image)

As seen in Figure 2, the Waterfall development method is based on a number of steps or phases where each phase is completely finished before the next phase starts. The iterative relationship that is portrayed in Figure 2 is based on that each step progresses where the product or service is further detailed, there is an iteration with the preceding and succeeding phases. Despite the existence of iterative work, Royce (1970) mentions that the iteration is rarely with the more remote steps in the sequence, hence it is still considered to be a method with strictly followed sequences.

The Waterfall development method portrayed by Royce (1970) is mainly aimed at managing large software developments. However, it has been used for both smaller and larger projects for the last few decades (Stober and Hansmann, 2009). The Waterfall development method is structured in a way where both requirements and how the work is going to proceed throughout the project time are defined at an early stage and are thereafter strictly followed (Royce, 1970). This structure that is provided by a Waterfall approach is according to Stober and Hansmann (2009) one of the most efficient ways to carry out a project, if everything goes as planned and is error-free. It is important that the plan is executed exactly as planned since changes become more expensive the later they are done, and that will in turn cause a significant cost for the whole project. As everything is planned upfront, and from what can be seen in Figure 2, the testing phase occurs at the end of the
development cycle which also becomes the first event of where the developed product or service is experienced. Therefore, Royce (1970) mentions that the implementation illustrated in Figure 2 is likewise risky and may invite failure. The delivered outcome is distinguished from analyses done during the first phase, and if these phenomena fail to satisfy the various external constraints, then a redesign will be required which includes a substantial change in the design or new modified requirements. In addition, according to Royce (1970), the process can sometimes return to the initial stage and one can expect up to 100-percent overrun in both cost and schedule delays. Stober and Hansmann (2009) added that it is almost impossible to carry out larger projects or projects with some level of innovation without any change. Therefore, the Waterfall development method does not cope well with change and generate rework. Adding to that, the method even has a tendency of pushing problems to later phases which can lead to unpredictable quality due to late testing (Petersen et al., 2009). Therefore, the Waterfall model has become to be connected with high cost, high efforts and old-fashioned, and thereupon there exist trends showing an increased interest in Agile and incremental development (Petersen et al., 2009). Agile development will be further described in section 2.2.

There are additional reasons that have been detected for the failures of Waterfall approaches. One reason is the management of a large scope where for instance the requirements are not well managed. The consequences could be that the customers’ current needs are not addressed by the end of the project, which caused the implemented features being obsolete and falling in disuse (Petersen et al., 2009). A second reason is that there is a problem in integrating the overall system at the near end of the process, where products are either not deployed or if they are deployed, they are usually not used. This is often due to the change of needs when the clients have become more concrete with their ideas and requirements, or a lack of opportunity to clarify misunderstandings where for instance the customer cannot provide any feedback during the process (Petersen et al., 2009). This means that the project team needs to go back to the first phase and add the new requirement to the predefined requirements and design (Stober and Hansmann, 2009). However, Royce (1970) discussed that the development risks that follow when using the basic approach that was illustrated in Figure 2 can be minimized, but some features must be added. The features mentioned are as following:

- To design first and not wait until the analysis is completed
- Make documentation of the product or service that is being designed and produced
- Do it twice
- Build a pilot model and make pilot tests before presenting the final result
- Let the customers be involved in the process

These features may mitigate the development risks, but these features do also have some challenges. For instance, designing without a complete analysis means that the person needs to design in a relative vacuum of initial requirements, or that there could be a lot of documents to read through for those that are involved in the latter phases. (Royce, 1970)

After all, the method is still being used and is preferable for projects where for instance all requirements are fixed, and project demands are thoroughly defined, or smaller projects that are
mostly repeating something that was done before (Stober and Hansmann, 2009). The Waterfall method is predictable and pays attention to planning the architecture and process. Without having a focus on architecture planning, there is a risk of making decisions based on tacit knowledge and not explicitly documented and reviewed (Petersen et al. 2009).

2.2 Agile software development methods

Software development agility is a popular term that has been well-discussed during the last two decades. It is a multidimensional concept and can be defined differently (Lee and Xia, 2010) but the common definition of agility is readiness for change and the ability to embrace rapid changes. For instance, Conboy and Fitzgerald (2004) described agility as:

“The continual readiness of an entity to rapidly or inherently, proactively or reactive, embrace change, through high-quality, simplistic, economical components and relationships with its environment” - Conboy and Fitzgerald, 2004.

Meanwhile, Qumer and Henderson-Seller (2008) offered another definition of agility which is:

“Agility is a persistent behavior or ability of an entity that exhibits flexibility to accommodate expected or unexpected changes rapidly, follows the shortest time span, and uses economical simple and quality instruments in a dynamic environment; agility can be evaluated by flexibility, speed, leanness, learning, and responsiveness” - Qumer and Henderson-Seller, 2008.

In addition, Preiss et al. (1996) clarified that the condition of change in agility is continuous as they defined agility as “a continual readiness to change”. Many researchers have tried to describe the core ideas of Agile methods in other disciplines, for instance, Conboy and Fitzgerald (2004) expressed the underlying concepts of Agile as flexibility and leanness which came from much older fields. Leanness in this context is referred to the lean thinking which has its root in the Toyota Production System from the 1950s, and in which reduction and elimination of waste and “doing more with less” are its main focus.

Vidgen and Wang (2009) provided the key features that enable agility within organizations. These features are self-management with discipline, time-pacing, and incitement for explorations. In the meanwhile, factors such as centralized control, event pacing which means responding to events and changes in a more traditional and reactive approach and not having a routinization of exploration would inhibit agility. Team autonomy is another crucial factor that would help to speed up the process of implementing the Agile approach within the organization. Self-organized, self-directed and self-disciplined teams are mostly preferred when working with agility, as these types of the team bring decision-making authority to the hands of the team members who are actually dealing with the problem and trying to solve it. That, in turn, will speed up the problem-solving processes (Highsmith, 2004; Larman, 2004). In team autonomy, it is the team members that determine the procedure and methods that will be used, schedule, how to use the assigned resources and how the task will be assigned to each member (Breaugh, 1985). In addition, self-organizing
teams are according to Nerur and Balijepally (2007) described as the key for responsiveness and flexibility.

2.2.1 Agile project management within public agencies

Despite the adoption of agile practices has been increased in the past years, the implementation of Agile approach is, however, still quite slow for public agencies, but the fact that the Agile project management is gaining notoriety in public agencies cannot be neglected as there are a number of empirical studies showing that there is a gradual evolution of Agile practices found in several public agencies from different countries. The study done Kaczorowska (2015) demonstrated that the risk management quality of the project increases when applying the agile approach. The iterative approach of Agile practice allows to continuously supervise the project progress with high precision and enables the possibility to react when for instance the project is about to exceed the budget or having the risk of not being able to deliver the result or solution in time. Further, Kaczorowska (2015) even clarified there is a set of conditions that have to be achieved when considering using Agile project management in order to meet the organization’s strategic objectives. The conditions include for instance, organizational and decision-making culture, financing methods, standardization of project management methods and risk management. Kaczorowska (2015) even stressed out the increase of bureaucratization in the public sector within the EU will demand to bend one of the principles of Agile project management. Another study done by Roses, et al., (2016) aimed to propose a model that assesses to which degree the conditions are favorable for the adoption of Agile practices. The conditions are based on three main dimensions which encompass knowledge, administration, and processes. In each dimension, there are several perspectives that are used for the assessment.

Continuing, there are few studies that have been conducted with the pursuance of identifying the challenges in the adoption of Agile methodology in public agencies. One of the studies is written by Nuottila et al., (2016) in which the authors have addressed seven categories of challenges as follows:

- Documentation - Even though Agile practices promote light-weighted documentation. However, it would become an issue if the development team relocates, and documentation on what was done and why a certain decision has been made would be lacking or missing. Then, the knowledge will be lost.

- Education, experience and commitment - It is important to instruct everyone in the organization about the decision of implementing Agile practices. It should not come all of a sudden.

- Stakeholder communication and involvement - As the agency has strong cooperation with its partners, the iterative work would become an issue due to the difficulty of involving the partners into each iteration or obtaining their approval for each small change during the project.
- Roles in agile set-up - Agile methodology implies changes in job roles. It remains a challenge for the agency to fully understand the central roles of Agile practice (in this case, Scrum master, Product owner, etc.) and to delegate the work correctly.

- Location of the agile teams - Team members are working remotely from different locations, and this has made it difficult to work with agile approach.

- Legislation - When change in legislation takes place, delivery date is predetermined, and the product/service needs to be available at the set date. This, however, would inhibit the agility in project management.

- Complexity of Software architecture and system integration - The agency’s developed system is quite complex and has many integrations which makes the implementation of Agile practice become quite challenging. Whenever a change is made within the system, developers have to always consider the other integrated systems that can be affected

The same way, a study done by the United States Government Accountability Office (2012) has brought forth 14 challenges with adopting the Agile practices in the federal environment and in which most of them are similar to the challenges that Nuottila et al., (2016) have identified above.

2.3 Different methods within the Agile family

The principles and practices of Agile development methods were originally designed for small and co-located teams, and in order to leverage the potential benefits in larger enterprises, the Agile practices have to be scaled (Putta et al., 2018). Therefore, to support scaling, new frameworks such as SAFe have been proposed, and they will be presented below. Likewise, RUP and Scrum will also be reviewed as it has been one of the most used Agile frameworks in software engineering.

2.3.1 Rational Unified Process (RUP)

Rational Unified Process (RUP) is known as being an incomplete framework with the purpose of letting organizations create their own method configurations and tailored processes. The key principles for business-driven development that RUP encompasses are to adapt the process, balance stakeholder priorities, collaborate across teams, demonstrate value iteratively, elevate the level of abstraction, and focus continuously on quality (Barnes, 2007; Shuja and Krebs, 2008).

Furthermore, RUP is role-based or sequence-based and defines the process in terms of four phases which are inception, elaboration, construction, and transition. Each phase can be further structured into several iterations where each role is well defined and mapped to specific activities in the four phases of the process (Barnes, 2007; Shuja and Krebs 2008). See Figure 3 for a visual presentation of the structure of RUP.
Furthermore, Figure 3 illustrates that RUP makes up a two-dimensional structure with task assignments/activities listed sequentially on the vertical axis and four main phases are displayed on the horizontal axis at the top. Almost all of the activities are encompassed in all four phases, but to different degrees. For instance, in the first phase, Inception, the first two activities of Business Modeling and Requirement will be operated mostly in this phase. However, other activities will likewise be operated, but only to a small degree. Despite not having the typical linear process, the focus of each activity on the vertical axis shifts depending on the phases on the horizontal axis. Hence, it can be reconnected to the Waterfall development. As RUP includes decision points at the end of each phase that determines if the project should continue to the next phase or not (Lunell, 2003), RUP then can be described to provide somewhat of an iterative and incremental approach (Shuja and Krebs, 2008).

Generally, when working with projects, there is a risk that problem could occur a short time before the delivery day of the final product or service (Lunell, 2003). An example of such problem is for instance integration problem where different parts or components of the service or product cannot function together, just like different puzzle pieces that do not match. To counteract such a problem, RUP is designed with the purpose of minimizing the risk for such problems to occur where some of RUP’s fundamental principles seem to allow it. Some of RUP’s fundamental principles are described as following:

- **An iterative approach**
  - One of RUP’s basic ideas, to work iteratively during the development process because it gives the opportunity to correct decisions that were taken at an early stage which might have turned out to not be good after further investigation.

- **Risk focus**
  - Risk analysis and early actions on estimated risks help to minimize failures or problems at the development’s latter stages.

- **Requirement management**
RUP anticipates that requirements cannot be completely defined at the beginning and they could change over time. Therefore, within an iterative approach, the requirements are constantly controlled against the customer’s intentions. (Lunell, 2003)

Theoretically, RUP could be used as it is formulated, but in practice, it needs to be modified and customized due to it being a general development process and which entails some consequences that have been identified by Lunell (2003). One of the consequences is that as RUP is rich in information and adaptable for many different types of projects, it may lead to information overwhelm. As a result, it might be difficult to understand and determine what information would be the most appropriate to use for a specific project. Another consequence with RUP is that the description of what and how things should be done provided by RUP is too general which could make it confusing and abstract for the developers as there are too many instructions, advice, and guidelines provided (Lunell, 2003).

2.3.2 Scrum

Scrum is a framework that includes a team-based organizational structure and has its main focus on project management where uncertainty and difficulty in planning are involved (Dybå and Dingsøyr 2008). This particular Agile framework is based on the mentality that many software development processes cannot be predicted, where only the planning and the closure phases are defined in a project. There are three main objects that are included in the framework, which are Sprint, Product Backlog, and Sprint Backlog (Schwaber and Sutherland, 2017).

Sprints are a series of flexible stages or time-boxes where the “done” or potentially releasable product increment is created. During each Sprint that is ongoing, no changes are allowed to take place, and each Sprint may be considered as a distinguished project that should not last more than one month. This is because it could change the initial definition of what was being built. Therefore, by limiting each Sprint to a maximum of one month, it limits the risk to one calendar month of cost. Hence, Sprints are used in order to accomplish something (Schwaber and Sutherland, 2017; Karabulut and Ergum, 2018).

Product Backlog is an ordered list, or a requirement set for the product or service and is provided by the stakeholders. The Product Backlog is often incomplete as the list or requirement set constantly changes in order to identify what is needed for the product to be appropriate, competitive, and useful. For instance, changes in business requirements changed market conditions, feedback of the product/service provided from the marketplace, and refinement may be added to the Product Backlog, hence the list is being filled over time and becomes larger (Schwaber and Sutherland, 2017; Karabulut and Ergum, 2018).

Sprint Backlog is the set of Product Backlog items selected for each Sprint including a plan for delivering the product increment and realizing each Sprint goal. Therefore, the Sprint Backlog makes all the work visible that the Development Teams have considered necessary in order to meet the Sprint goal (Schwaber and Sutherland, 2017; Karabulut and Ergum, 2018).
In Scrum, a team consists of a Product Owner, a Development Team and a Scrum Master. Scrum teams are designed in such a way that they are entirely independent of others who are not part of the team. The idea of keeping the team cross-functional and self-organized enables them to optimize flexibility, creativity, and productivity. By delivering products cumulatively, Scrum teams can get maximal feedback during the process and which in turn assures success for their final outcome (Schwaber and Sutherland, 2017; Schwaber and Sutherland, 2013).

Product Owner in Scrum has the responsibility of managing the product backlog and ensuring that the product backlog is clearly visible for the whole team, especially for the development team to a certain level so that they fully understand what needs to be done next. To be mentioned, the Product Owner is one person who may represent the desires of a committee in the product backlog and if any of those in the committee wants to make changes, then he/she will have to address the Product Owner. The Development Teams are responsible and perform the work of delivering a potentially releasable increment of “done” products/services at the end of each Sprint. The teams are structured and empowered to organize and manage their own work, and they work in a cross-functional way in order to reach out to all necessary skills to create a product increment. The size of an optimal Development Team is recommended not to consist of less than three members and not more than nine members, excluding the Product Owner and Scrum Master. This is because fewer than three members could decrease interaction and affect the results in smaller productivity gains, whilst more than nine members could require too much coordination. The Scrum Master has the responsibility to promote and support Scrum and its framework by helping everyone to understand Scrum theory, practices, rules, and values. For instance, the Scrum Master serves the Product Owner by helping to find techniques for effective product backlog management and ensure that the Scrum team understands the goals, scope, and product domain. The Scrum Master serves the Development Team by coaching and supporting them regarding self-organization and cross-functionality, and to create high-value products. Furthermore, the Scrum Master also serves the organization by for instance planning, leading, and coaching the organization in its Scrum adoption. (Schwaber and Sutherland, 2017)

Scrum can be seen as a subset of Agile which offers evolutionary cycles in order to be able to cope with a rapidly changing environment. The development method of Scrum accepts the fact that some development processes are unpredictable and hence, just like the principle of Agile, Scrum is built on iterative and incremental cycles where defects and mistakes are quickly identified and corrected under the process (Karabulut and Ergum, 2018). The concept of Scrum is to have ongoing research, taking feedbacks, continuously meeting customer demands, as well as creating and improving an output (Karabulut and Ergum, 2018). However, Scrum has some challenges in which the resistance to change could be seen as one of them as it mainly depends on the management and team perspectives. Another one is implementation difficulties, caused by for instance misunderstandings of the concept, and/or organizational limitations (Karabulut and Ergum, 2018). Additionally, Scrum is considered appropriate for small projects and teams as it provides better coordination whilst it might be more complicated to be implemented in larger projects, since it could require bigger and more complex coordination (Karabulut and Ergum, 2018).
2.3.3 SAFe

SAFe is a framework that aims to incorporate the practices of Agile and lean principles at the enterprise level and is a scaled approach to Agile adoption. The framework is a mix of several existing Agile approaches and incorporates practices from Scrum, Extreme Programming, Kanban, and Lean (Putta et al., 2018). Hence, SAFe is designed to support the agility within an organization by providing integrated principles and practices. The framework is publicly available and is currently documented in version 4.6, see Figure 4.

The framework is separated into four levels which are the Team, Program, Large solution, and Portfolio levels. The Team level comprises the Agile teams with roles, activities, events, and processes in order to build and deliver value in the context of the Agile Release Train (ART). The ARTs are introduced at the Program level and focus on continuously delivering solutions via an ART. At the level of Large Solution, a stronger focus is put on capturing requirements in solution intent, coordination of multiple ARTs and suppliers, and to ensure compliance with regulations and standards. Lastly, the Portfolio level contains the principles, practices, and roles that are needed in order to initiate and govern a set of development value streams. Where value streams are the series of steps that organizations use in order to build solutions that provide a continuous flow of value to a customer. Hence, in this level, the strategy and investment funding are defined for value streams and their solutions (Scaled Agile, 2018).

What differs the latest version with the previous ones is that in version 4.6 the Five Core Competencies have been added where each competency is a set of related knowledge, skills, and
behavior, which together is supposed to enable enterprises to achieve quality and value in shortest sustainable lead time (Scaled Agile, 2018). Also, there is a new area of guidance for the government in order to help public agencies to implement Lean-Agile practices in a government context. However, the five competencies are:

- The Lean-Agile Leadership competency:
  ○ How Lean-Agile leaders can drive and sustain organizational change by empowering individuals and teams to reach their highest potential. This is done by learning, exhibiting, teaching, and coaching the mindset of SAFe, values, principles, and practices.

- The Team and Technical Agility competency:
  ○ Describes the critical and Lean-Agile principles and practices that are needed in order to create high-performing teams that produce high quality.

- The DevOps and Release on Demand competency:
  ○ How implementing DevOps and a continuous delivery pipeline provide the capability to release value at any time in order to med the market and customer demand.

- The Business Solutions and Lean systems Engineering competency:
  ○ How to apply Lean-Agile principles and practices to the specification, development, deployment, and evolution of large and complex software applications.

- The Lean Portfolio Management competency:
  ○ A competency in order to align strategy and execution with Lean and systems thinking approaches to strategy and investment funding, Agile portfolio operations, and governance.

Furthermore, the framework provides a process model that covers all levels within the enterprise, including a mid-level planning cycle called the program increment (PI) and finding of stable long-term programs that are aligned to a flow of value to the customer (a value stream). SAFe has four core values which are alignment, built-in quality, transparency, and program execution (Measey, 2015). According to Putta et al. (2018) research, the most common benefits identified were transparency, alignment, quality, time to market, predictability, and productivity, and many had gained the benefits of the core values of SAFe when adopting it. However, Putta et al. (2018) argue that even if their research result showed that many practitioners think that SAFe has brought benefits, it is important to consider how the organizations measure these benefits and which benefits were actually provided by SAFe practices.

The challenges of adopting SAFe were resistance to change, moving away from Agile, first PI planning, controversies with the framework, Agile Release Train challenges, staffing roles, and GSD challenges (Putta et al., 2018). Even if SAFe is a framework for scaling Agile, previous studies showed that some could feel that they were moving away from Agile. An additional argument for this is, for instance, Pancholi and Grover (2014) argue that the SAFe framework “murders the spirit of Agile development” and is therefore not really an Agile. Pancholi and Grover (2014) also claim that it is sold to larger organizations that want to increase their productivity and reduce defects but are at the same time afraid of change. However, according to
Putta et al. (2018), there is a lack, and therefore a need, for more research into the challenges of adopting SAFe and how to overcome the challenges.

2.4 The difference between traditional approaches and Agile approaches

Dybå and Dingsøyr 2008 summarized the main differences between traditional method and Agile method, shown in Table 1.

*Table 1. The main differences between traditional and Agile development (Dybå and Dingsøyr 2008).*

<table>
<thead>
<tr>
<th>Fundamental assumption</th>
<th>Traditional development</th>
<th>Agile development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems are fully specifiable, predictable, and are built through meticulous and extensive planning</td>
<td>Systems are fully specifiable, predictable, and are built through meticulous and extensive planning</td>
<td>High-quality adaptive software is developed by small teams using the principles of continuous design improvement and testing based on rapid feedback and change</td>
</tr>
<tr>
<td>Management style</td>
<td>Command and control</td>
<td>Leadership and collaboration</td>
</tr>
<tr>
<td>Knowledge management</td>
<td>Explicit</td>
<td>Tacit</td>
</tr>
<tr>
<td>Communication</td>
<td>Formal</td>
<td>Informal</td>
</tr>
<tr>
<td>Development model</td>
<td>Life-cycle model (waterfall, spiral or some variation), aimed at large organizations</td>
<td>The evolutionary-delivery model, organic and flexible, with participative encouraging cooperative social action, aimed at small and medium-sized organizations</td>
</tr>
<tr>
<td>Desired organizational form/structure</td>
<td>Mechanistic (bureaucratic with high formalization), aimed at large organizations</td>
<td>Continuous control of requirements, design and solutions, continuous testing</td>
</tr>
<tr>
<td>Quality control</td>
<td>Heavy planning and strict control. Late, heavy testing</td>
<td>Continuous testing</td>
</tr>
</tbody>
</table>

As described in Table 1, traditional development encompasses projects that are built based on very clearly specified planning, a low rate of change and its management style consists of command and control. Moreover, traditional approaches in project management require explicit knowledge, formal and hierarchical communication and rely on linear life-cycle. Consequently, their organizational structure has a heavy bureaucracy (Dybå and Dingsøyr, 2008; Wysocki, 2011).

In the contrast, Agile development is built by small teams and their planning are usually not entirely fixed in pursuance of scoping with their rapidly changing environment, they are based on continuous improvements through feedback, and Agile development teams often have a strong collaborative management style (Dybå and Dingsøyr, 2008). Agile approaches need an evolutionary- and short delivery model to be able to respond to rapid changes and uncertainty in the environment (Wysocki, 2011). Their knowledge requirement is tactic and they have informal communication within an organization. This results in an organic organizational structure. Instead of having one strict and heavy quality control at the end of the project, Agile performs the control and testing continuously during the process in order to avoid “too late to fix” mistakes (Dybå and Dingsøyr, 2008).

2.5 A risk-based assessment of plan-driven method and Agile method

A risk-based process provided by Cockburn (2002) describes five-step that help developers to determine if either plan-driven methods or Agile methods will work best for their project, or if their project is only aligned with a combination of plan-driven method and Agile method. The plan-driven method is based on the performance of a sequential set of well-defined work phases, or in other words, a plan-driven method is similar to the traditional method. The five-step process is illustrated in Figure 5.
The ratings mentioned in the first step of the process include the project’s environmental dimensions, plan-driven, and Agile-oriented risks. According to Boehm and Turner (2003), it is important to address under which set of conditions the project is mostly aligned to. The more the project’s characteristics differ from one home grounds’ characteristics the higher the risk of the project failing if using the pure form of the chosen approach. In other words, if the characteristics of a project do not fall into any of the two home grounds, it would be valuable to combine both the approaches in order to succeed. Table 2 shows the project characteristics that Agile and plan-driven home grounds encompass.
Table 2. The home grounds of Agile and plan-driven project approaches (Cockburn, 2002; Boehm and Turner, 2003).

<table>
<thead>
<tr>
<th>Project characteristics</th>
<th>Agile home ground</th>
<th>Plan-driven home ground</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Rapid value, responding to change</td>
<td>Predictability, stability, high assurance</td>
</tr>
<tr>
<td>Size</td>
<td>Smaller teams and projects</td>
<td>Larger teams and projects</td>
</tr>
<tr>
<td>Environment</td>
<td>Turbulent, high change, project focused</td>
<td>Stable, low change, project and organization focused</td>
</tr>
<tr>
<td>Management</td>
<td>Dedicated onsite customers, focused on prioritized increments</td>
<td>As-needed customer interactions, focused on contract provisions</td>
</tr>
<tr>
<td>Planning and control</td>
<td>Internalized plans, qualitative control</td>
<td>Documented plans, quantitative control</td>
</tr>
<tr>
<td>Communications</td>
<td>Tacit interpersonal knowledge</td>
<td>Explicit documented knowledge</td>
</tr>
<tr>
<td>Requirements</td>
<td>Prioritized informal stories and test cases, undergoing unforeseeable change</td>
<td>Formalized project, capability, interface, quality, foreseeable evolution requirements</td>
</tr>
<tr>
<td>Development</td>
<td>Simple design, short increments, refactoring assumed inexpensive</td>
<td>Extensive design, longer increments, refactoring assumed expensive</td>
</tr>
<tr>
<td>Test</td>
<td>Executable test cases define requirements, testing</td>
<td>Documented test plans and procedures</td>
</tr>
<tr>
<td>Personnel</td>
<td>Dedicated, colocated Crack* performers</td>
<td>Crack* performers, not always colocated</td>
</tr>
<tr>
<td>Developers</td>
<td>At least 30% full-time Cockburn Level 2 and 3 experts; no Level 1B or Level -1 personnel</td>
<td>50% Cockburn Level 3s early; 10% throughout; 30% Level 1B's workable; no Level -1s</td>
</tr>
<tr>
<td>Culture</td>
<td>Comfort and empowerment via many degrees of freedom (thriving on chaos)</td>
<td>Comfort and empowerment via framework of policies and procedures (thriving on order)</td>
</tr>
</tbody>
</table>

Cockburn (2002) has even graphically summarized the factors shown in Figure 6 in a polar chart, where Cockburn (2002) has picked out 5 critical factors that is useful for developers to find the most appropriate method balance for their projects.

![Figure 6. The tool for determining method balance (Cockburn, 2002; Boehm and Turner, 2003).](image)

As known from the different project characteristics shown in Table 2, the Size of the Agile team is usually small, and a plan-driven project usually requires a much larger team size, hence, the nearer the graph’s center, the more Agile the project should embrace. Likewise, on the axis of Criticality, the nearer one project has a tendency of approaching the periphery, the more plan-driven it is due to a plan-driven project usually bringing huge losses. The axis of Culture reflects the fact that the
Agile project will be more likely to succeed if they thrive on chaos, and plan-driven projects have a higher degree of following orders. The last two axes are however asymmetrical, for Dynamism, the Agile method could be succeeded at both ends as it tolerates both degrees of change. But the plan-driven method is only at home with a low rate of change. On the contrary, for Personnel, the plan-driven method works well with both ends, which means both high and low skill levels are acceptable in a plan-driven project. However, in the Agile method, a higher level of skill (the middle of the axis) is most preferable. (Cockburn, 2002; Boehm and Turner, 2003; Boehm and Turner, 2004)

Summary of chapter 2

This chapter presents the literature of development methods including Waterfall and Agile. For Agile development, the frameworks RUP, Scrum and SAFe were reviewed as they were of most interest in this research and a number of empirical studies regarding the Agile adoption within public agencies have also been covered in this section. All of the reviewed methods have been used within the software industry and for various projects. Each method has its pros and cons which have been covered in this chapter. Moreover, the differences between the traditional approaches and Agile approaches are also presented in this chapter. Lastly, it is difficult to determine what development method should be used for a certain type of project due to the fact that different methods may bring different risks for different project works. Hence, a risk-based assessment of the plan-driven method and Agile method has been reviewed where previous researchers have addressed the importance of knowing which set of conditions the work is most aligned to.
3. Methodology

*This chapter aims to present the method that has been used for conducting and analyzing the data that is needed to achieve the purpose of this paper. Firstly, research design and data collection are presented. Thereafter the data analysis, the quality of the research and ethical considerations are articulated.*

3.1 Research design

This paper’s purpose is to analyze to what extent the Agile method can be implemented within public agencies and identify the challenges when adopting Agile practices. The results provide a gap-filling contribution. Gap-filling is a way of constructing research questions by spotting gaps in existing literature (Sandberg and Alvesson, 2011). Furthermore, as the research subject is broad and complex, a qualitative research approach including a case study has been used. In section 1.3 it was outlined how the thesis aims to analyze to which extent Agile can be implemented within public agencies and identify the challenges when adopting Agile practices. Due to the fact that research within this field is found rare and limited, and an in-depth investigation is needed, a qualitative research approach was chosen. The qualitative research method can be a powerful technique when it is used to build and refine new or existing theories (Shah and Corley, 2006). This research approach also allows the researchers to discover new variables and relationships as well as reveal and understand complex processes, it is, therefore, appropriate for studies that require in-depth knowledge (Shah and Corley, 2006).

When it comes to case studies, this research method can lack rigorousness and objectivity where Yin (1994) also stressed the fact that case study research often fails to develop sufficient operational measures where the collected data may be based on subjective judgement. Therefore, it is important for the researchers to find multiple sources of evidence during the data collection and create a triangulation. By doing a triangulation of the findings, the data can be reviewed in conjunction with a review of the literature on the subject (Yin, 1994). However, case study is still considered as a useful tool for the exploratory stage of a research project and an approach that supports deeper and more detailed investigation (Rowley, 2002). Rowley (2002) and Yin (1994) even mentioned that case study research is also suitable for contemporary events and when exploring a phenomenon of real-life nature, and can provide answers to for instance “How?” and “Why?” questions. Therefore, case study may provide detailed and rich knowledge for the problem being studied and its research questions.

In order to get a broader preference of the public agencies and not only on the Swedish Tax agency, the researchers did also contact the Swedish Migration agency for an interview which also had the purpose of being a benchmark. Benchmark is used as a tool for performance improvement and have different definitions such as “the search of industries best practices”, “a process of continually comparing a company’s performance on critical customer requirements against that of the best in the industry” or “product quality and feature comparisons” (Fong et al., 1998). Therefore, it can be described as looking at what others do better and then aim to learn from that, where organizations can compare themselves with industry best practices. However, in this research, the
interviews did also provide a broader preference of how other public agencies have or are applying Agile in their organization.

Since the researchers identified that research within this field was found limited and that the Swedish Tax agency was aware that they had challenges with their project management and was interested in an Agile transformation. Hence, the researchers contacted the Swedish Tax agency in order to do a more in-depth investigation of the subject of an Agile transformation within their organization. Thereafter, a literature study was conducted and interviews with employees from the agency were carried out, see section 3.2 for data collection. Interviews were also completed with another public agency, in this case with the Swedish Migration agency. The Swedish Migration agency considers applications from people who want to acquire temporary residence, permanent residence, the Swedish citizenship, come for a visit, and seek protection from persecution (Migrationsverket, 2019). The agency receives over thousands of applications every year where some of the applicators’ lives are at stake (DI Tema, 2019). Therefore, the researchers chose to contact the Swedish Migration agency with beliefs that they might have come further with Agile adoption. Further on, the first-hand sources used in this report are information and documents provided by the Swedish Tax agency whilst second-hand sources are taken from literature and information provided by the Swedish Migration agency. What can be noticed is that the researchers have worked iteratively throughout the period of the investigation with the collected data and literature in order to be able to continuously fill up with the material that is needed during the investigation.

### 3.2 Data collection

To obtain knowledge and a better understanding of the area being investigated, data can be gathered directly from those who are experiencing the phenomenon firsthand through, for instance, interviews. Therefore, data has been collected from the Swedish Tax agency which this research has used as a case study and the Swedish Migration agency, which has been used for the benchmark.

#### 3.2.1 Interviews with the Swedish Tax agency

The primary source of empirical data is conducted from semi-structured interviews with employees working in different departments from the Swedish Tax agency, and all interviews were conducted throughout the period of the investigation. A guideline over the themes and questions that were discussed are presented in Appendix I. Since all the interviews were held in Swedish, all citations in this report have been translated freely by the authors. Table 3 shows a list of people who have been interviewed for this study and in which department they are working.

**Table 3. List of interviewees from the Swedish Tax agency.**

<table>
<thead>
<tr>
<th>Date</th>
<th>Interviewee</th>
<th>Department</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>08/02/2019</td>
<td>P1</td>
<td>Customer relationship department (in Swedish: Kundmötesavdelningen)</td>
<td>90 minutes</td>
</tr>
<tr>
<td>Date</td>
<td>ID</td>
<td>Department</td>
<td>Duration</td>
</tr>
<tr>
<td>------------</td>
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<td>-----------------------------------</td>
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</tr>
<tr>
<td>27/02/2019</td>
<td>P2</td>
<td>IT-department (in Swedish: IT-avdelningen)</td>
<td>51 minutes</td>
</tr>
<tr>
<td>27/02/2019</td>
<td>P3</td>
<td>Customer relationship department</td>
<td>61 minutes</td>
</tr>
<tr>
<td>18/03/2019</td>
<td>P4</td>
<td>IT-department - Development unit</td>
<td>51 minutes</td>
</tr>
<tr>
<td>26/03/2019</td>
<td>P5</td>
<td>Customer relationship department</td>
<td>52 minutes</td>
</tr>
<tr>
<td>26/03/2019</td>
<td>P6</td>
<td>IT-department - Development unit</td>
<td>57 minutes</td>
</tr>
<tr>
<td>06/05/2019</td>
<td>P7</td>
<td>IT-department</td>
<td>34 minutes</td>
</tr>
</tbody>
</table>

Semi-structured interviews were conducted as it allows new ideas to be brought up during the interviews as a result of what the interviewees answered and discussed when a blend of closed- and open-ended questions were asked (Newcomer et al., 2015). Therefore, the semi-structured interviews allowed the researchers to obtain a better understanding of how the agency has worked and why there is an interest in a readjustment.

The interviewees were from the Swedish Tax agency’s IT-department and the development unit which is a unit that organizationally goes under the IT-department, see section 1.5 for a more detailed description. The development unit generally works with questions relating to development within the agency such as architectural control and develops portfolios which consist of strategic investments. They do even support the management team by providing different strategic planning. Therefore, the case of Agile transformation within the agency is also currently being managed by the development unit.

Interviews were also held with employees from the customer relationship department who are responsible for the level of customer interaction with the agency. The customer relationship department is one of all departments that have a partnership-like relation with the IT-department and are therefore more or less affected by the development unit. Furthermore, the Swedish Tax agency has also announced that they want to be able to meet the customer demand in earlier stages. Therefore, interviewing people from the customer relationship department allows the researchers to understand the complexity and in-depth of how the agency works and their intention of readjusting their work processes.

Furthermore, many of the interviewees have worked for the Swedish Tax agency for many years and have a good understanding of the internal way of working and are all more or less involved, or will be affected by the case of an Agile transformation. Many of the interviewees have also either been or are currently working as project managers, or have been involved in projects. Hence, the gathered data can be seen as valuable and appropriate since it is collected from those who are directly experiencing the investigated phenomenon. For each interview, the themes and main questions were prepared beforehand, and the interviews were recorded after receiving consent from each participant. The interviews conducted at the case company was mainly to collect data
regarding how the agency has worked, their view of an Agile transformation, and more detailed questions regarding their project management.

3.2.2 Interviews with the Swedish Migration agency

In order to get a wider preference of the investigated phenomenon, the researchers even contacted the Swedish Migration agency who has been using Agile methods within the agency and is planning on continuing using it (DI Tema, 2019). Hence, the secondary source of empirical data is from semi-structured interviews with employees from the Swedish Migration agency. The interviews were held in Swedish, hence all citations in this report have been translated freely by the authors. The themes and questions discussed during the interviews are presented in Appendix I, and the participants presented in Table 4 only has the interviewees’ departments mentioned.

Table 4. List of interviewees from the Swedish Migration agency.

<table>
<thead>
<tr>
<th>Date</th>
<th>Interviewee</th>
<th>Department</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/04/2019</td>
<td>P8</td>
<td>System Development unit (in Swedish: Systemutvecklingensheten)</td>
<td>57 minutes</td>
</tr>
<tr>
<td>09/04/2019</td>
<td>P9</td>
<td>Digitalization and Development unit (in Swedish: Digitalisering och utvecklingensheten)</td>
<td>21 minutes</td>
</tr>
</tbody>
</table>

Just like the interviews with the Swedish Tax agency, the structure of the interviews held with the Swedish Migration agency was the same and included both closed- and open-ended questions. The interviewees were from the System Development unit, and Digitalization and Development unit. Both of the interviewees have been and are working with different projects regarding, for instance, IT and development within the agency. By interviewing them, data could be gathered from those who are directly experiencing and working with projects and project management. Furthermore, data from other perspectives within the Swedish public agency could also be gathered which in turn can support a deeper and more detailed investigation.

Questions for each interview were prepared beforehand in order to use as a guideline during the interviews. The purpose of these interviews was mainly to collect data regarding their view of Agile methods within the agency, how and what methods the agency has used and want to use in the future, and more detailed questions regarding their project management. Before each interview, the researchers asked for each participant consent for recording the interviews, which the researchers got permission to do.

3.3 Data analysis

The collection of the primary data came from interviews with employees from the Swedish Tax agency. When conducting the data collection, it was prioritized to get information from those who are directly experiencing, or have experienced, the investigated phenomenon. Therefore, these people were found through two methods, and these methods are snowball sampling (also called
networking), and judgmental (also called purposive sampling) (Collis and Hussey, 2014). The first method was utilized by asking the interviewee and the supervisor from the Swedish Tax agency if they knew of anyone else who has been through the same experience as the investigated area and if they could put the researchers in touch. The second method was utilized by the researchers through their experience of the phenomenon under the study where the collected information from secondary sources such as articles and documents helped navigate what other actors to contact and interview. The second method was also mainly used when collecting second-hand empirical data. However, when seeking depth and richness of data, it becomes important to limit the scope of the study (Collis and Hussey, 2014). This provides more focus and helps to reduce the amount of qualitative data that is being collected in a manageable amount.

During the research and analysis of the collected data, both an inductive and deductive research approach has been used. Deductive research is when a hypothesis is derived from existing theory and the empirics are then explored and data is collected in order to test the derived hypothesis (O’Reilly, 2009). Inductive research does instead begin with as few preconceptions as possible in order to allow theory to emerge from the data (O’Reilly, 2009). Therefore, a deductive research approach can be described as beginning with the general and end with the specific, whilst an inductive research approach moves from the specific to general (Soiferman, 2010). For this report, an inductive research approach has been used on the analysis of the first three interviews with the Swedish Tax agency. By using an inductive approach the researchers were enabled to work exploratory into the investigated phenomenon and in turn, navigate the researcher towards areas where more information was needed. The latter interviews, both with the Swedish Tax agency and with the Swedish Migration agency, were conducted deductively. This is because the first three interviews were already transcribed and analyzed, hence the findings considered most relevant and where there were still uncertainties for the researchers, became the areas in which the researchers needed to dive deeper into. Thereby, the latter interviews were carefully selected depending on their experiences, task assignments and roles.

3.4 Validity and reliability

The quality of the research is important, where the report’s findings need to be both reliable and valid. Reliability is referred to the accuracy and precision of the measurement and the absence of differences from repeated researches (Collis and Hussey, 2014). Collis and Hussey (2014) did also mention that for a research result of high reliability, the repeated study should produce the same result as the original study. However, the importance is placed on whether observations and interpretations that are made on different occasions and by different observers can be explained and understood. The reliability of a research does also depend on how the research has been conducted, for instance, if the empirics are collected and handled with impartiality by the researchers (Blomqvist and Hallin, 2015). Whilst validity is referred to the extent of how well the study measures the intended, and how well the findings reflect the investigated phenomenon, where having inappropriate research design with such as faulty procedures and inaccurate or misleading measurements can undermine the validity of the research (Collis and Hussey, 2014).
In order to obtain high reliability and validity of the research, it has been important for the researchers to obtain an objective view throughout the whole investigation and not let subjective opinions affect the interpretations and analysis of, for instance, the collected data. When choosing what research design to use for the investigated phenomena, it was thought through before any other actions were done. The interview questions which were prepared before each interview and used as a guideline were outlined with the purpose to gather rich data of the investigated area. Therefore, the agencies and interviewees were carefully selected. However, this research has used a qualitative research approach and conducted interviews. The answers from the interviewees could be dependent on current knowledge, their experiences or even mood. Therefore, it is, for instance, difficult to ensure that the interviewee will provide the same answer and information at a later time. In order to ensure that the provided information is reliable and minimized from being biased, many of the interview questions were asked to multiple interviewees. Some questions could not be asked to multiple interviewees due to participants knowledge and experiences. These answers or information could therefore not be compared. Lastly, this research is supposed to look into the market of Swedish public agencies, if more than the two mentioned public agencies could be investigated and included in the study, it could maybe provide a higher validity of the research findings.

3.5 Ethical considerations

A qualitative research approach does often include interviews and other data gathering methods such as observations which concern people. Therefore, from an academic viewpoint, ethical issues need to be considered when documenting these findings in order to respect the participants as well as to avoid falsification, plagiarism, and fabrication. This research has been conducted in compliance with the Swedish Research Council four ethical main requirements which are the information requirement (in Swedish: Informationskravet), the compliance requirement (in Swedish: Samtyckeskravet), the confidentiality requirement (in Swedish: Konfidentialitetskravet), and the utilization requirement (in Swedish: Nyttjandekravet) (Vetenskapsrådet, 2002).

All interviewees are denoted by P1 to P9 and the department they work for is also shown in the report. Before each interview, every interviewee was informed about the purpose of the study and how the information would be used in the report. The interviewees who are presented in this report have given their consent to participate, and the obtained data is only used for the purpose that they have provided consent to.

Summary of chapter 3

This chapter outlines the research approach used throughout the whole research process, and how the empirical data has been conducted. A qualitative research approach and a case study have been carried out throughout the study due to a need for in-depth knowledge of the broad and complex research subject. The empirical data was gathered through interviews with employees from the Swedish Tax agency and employees from the Swedish Migration agency whom have worked and/or are currently working with the researched phenomenon. Both an inductive and deductive approach were used for the data collection as they allowed the researchers to work exploratively
into the investigated phenomenon and thereafter make up the report’s content with information that was missing or insufficient. All interviews were conducted in compliance with the four requirements of the Swedish Research Council, and the researchers strived for high quality and reliability of the study, therefore this chapter also outlines the report’s validity and reliability. The researchers have worked iteratively throughout the research process which has allowed the researchers to continuously fill up and complement with material during the investigation.
4. Findings

This chapter is set to present the research results from the interviews with the Swedish Tax agency. As mentioned in the previous chapter, interviews have been conducted with the Swedish Migration agency in order to make a comparison towards the studied agency and in which the result will also be presented below. No analysis is made in this chapter and all the citations have been freely translated by the authors from Swedish to English.

4.1 Findings of the Swedish Tax agency

Project management methods with a Waterfall approach were identified to have been used within the Swedish Tax agency. This approach or the traditional way of working has been used within the agency for many years and is still being used to some extent in the agency today. From the data collected, the Waterfall-based project management method has provided good control, well-structured project plans and clear instructions about what needs to be done at each phase of the projects. However, Agile adoption and Agile project management seemed to be a topic with growing interest. The Swedish Tax agency seemed to have used Agile methodology such as Scrum to a small extent since some time and want to further adapt to the Agile approach. This has led to many considerations, thoughts and discussions about this where some are happy about it whilst some are still skeptical and hesitative. The findings regarding the Waterfall approach and Agile approach within the Swedish Tax agency will be further presented in the section 4.1.1 and 4.1.2.

4.1.1 Waterfall approach within the Swedish Tax agency

The methods that have been operated within the Swedish Tax agency over the past decade are PM³, Pejl, and RUP. In short, PM³ was not used as a project management method but was described as an interaction model or a management structure with the purpose of creating a joint and a common direction for the IT-department and the rest of the agency. The second one is Pejl which is a framework and could be seen as an operation management model for managing changes and development. Various activities were set in Pejl to help the organization to reach their set goals which in turn contributed to an effective development for the organization. For that reason, Pejl is still being used in some of the agency’s projects. The last-mentioned was RUP which has also been used in some of the agency’s projects. RUP could be roughly described as a process framework that divides the development process into different phases, see section 2.3.1 for more information about RUP. Despite that RUP is supposed to provide an iterative approach to the workflow, yet the workflow within the agency is still moving towards a more Waterfall-based. (P2; P6)

During the past years, the Swedish Tax agency has had many different kinds of projects including IT and non-IT-related but for a major part of them, the experiences and project outcomes do not often correspond to the expectations as some projects did exceed their budget, planned deadline and alter the predetermined amount of involved people, as well as some, did not achieve the expected value-creation. The agency has had projects with a time span of a couple of months up to several years, where the approximate time-span for what they called a larger projects was estimated to around 3 years. Adding to that, the size of the projects does also differs depending on what kind
of project it is, and the number of people involved could differ from approximately 20 people up to over 200 people. People could be continuously added into the projects when realizing that some competencies need to be added to complete a certain work task (P6). However, during the time the project was processing, changes could take place and requirements could become unstable. That, in turn, could affect the project results and cause the final value creation of the project not achieving its expected value as the delivered outcome was being based on the requirements made at the project’s start, which could be, for instance, 3 years ago. P2 expressed it as follows:

“After 3-4 years, many things could happen and thereby the requirements/demands that were set 3 years ago, or sometimes even one year ago, become obsolete at the time the project is done and the result is delivered. As soon as we decide on a set of requirements and what we should do, it is already starting to become outdated. This leads us to work with a goal of realizing the requirements and not reaching a good effect.” – P2, the Swedish Tax agency, 2019.

Even if there is a will for working more iteratively, there was always a tendency of going back to the traditional work structure as it has been used for many years and many are comfortable working with it. It was also mentioned that the Waterfall approach has made it possible for the Swedish Tax agency to always deliver something from their projects, even if it sometimes meant to deliver the results after the deadline, at a high cost, and/or a deteriorated project value. However, when a project exceeds in terms of time and cost, it could affect other projects: such as reduced resources for upcoming projects, or in the worst case the upcoming projects will need to be canceled (P4).

4.1.2 Agile approach within the Swedish Tax agency

To begin with, the Swedish Tax agency underwent a reorganization in the year 2017 where, for instance, the regional divisions were abolished, and the agency got a new organizational structure, which is shown in Figure 1 in section 1.5. In connection with this, it was decided that the agency will put aside PM³ but continue using the other methods, RUP and Pejl, and at the same time undergo an Agile transformation where they want to introduce the Agile framework SAFe. The reasons to become more Agile was becoming more transparent, to be able to deliver products and services that meet the customer demands, and to avoid bigger projects that require excessive resource in forms of time and money. Furthermore, some of the interviewees discussed that the Waterfall-based projects are difficult to be redirected when it has gone halfway through the project time which could affect the process and its delivered results. This is believed to be made possible by thinking and working differently in comparison to the traditional, hence, to work more iteratively. However, the agency wants to and has seen the need to implement the Agile adoption to both the IT department, but also operation function where the two have to do the journey together. This is because the operation function can be seen as providing the “What” whilst the IT department can be seen as providing the “How”, where these two different competencies complete each other (P4). Therefore, if the journey is not being performed together, there is a risk that the expectation image will differ within the agency. This, in turn, could make it difficult for the Swedish Tax agency to work towards the same goals and do the same prioritizations, which is needed in order to get the best effect and value from the work that is being done.
The interviewees explained that an iterative approach for the work process and project management may allow them to work in a way where requirements are constantly being validated. It is also believed to help the projects to have a continuous overview of their process and if it is moving in the right direction to achieve the desired value creation. By working iteratively, errors can be detected at an earlier stage, which in turn enables readjustments and redirection of the project to take place before it is too late. As a result, instead of trying to fulfill the predefined requirements that are already considered being outdated, the project outcome is ensured to achieve value creation and reach an impact goal. As an outline for this, one of the interviewees stated as following:

“Instead of doing something that we think or believe is the best solution at the moment a project started, and when releasing after two years it becomes outdated because of the obsolete requirements that were set in the past, it might be better to work more iteratively with the help of Agile sprints, then some values could be delivered continuously. Indeed, everything gets old, but we could avoid delivering outdated products or services from the beginning.” – P2, the Swedish Tax agency, 2019.

By this, it is believed that it might be more effective to work with shorter planning cycles with an iterative approach and constantly delivering a small amount of value instead of waiting for a whole project to be completed, which could take a few years and have an insecure value-effect. Furthermore, it is also believed to improve the current way of working within the agency, such as providing clarity and to work with both the strategic perspective and product-focus at the same time. When asking more about the Agile methodology, P2, P5 and P7 demonstrated that it has been present within the agency and some projects even before the decision made in the year 2017. Further on, many of the interviewees believe that the agency could and should become more Agile and work with such methods than what is done today. However, even if there is much talk about becoming more Agile, P5 mentioned that it is still obscure. Further on, even if the Agile methodology has been present for a certain time, the language and definitions were not very clear, which has caused some confusion and obscurity. For instance, before, the Agile work was consciously used within the IT-department, but it was processed in an unstructured way, where some worked with Scrum, some with Kanban, and maybe even a mix of both. Much of the work has been much inherited from RUP and their own implementation of RUP called KUR. Another interviewee mentioned that many may follow or use the different Agile methodologies as a guideline and strictly follow it like a rule book, but rather that they should only pick what they need from the basket according to P7. Adding to that, P7 further described the action of picking the only necessary part from the Agile-basket as turning an audio stereo, he emphasized the importance of not screwing back the old one you are used to, and that you should be braver and dare to try new things. Therefore, a common framework that can be used and understood by everyone is needed in order to minimize such miscommunication or language barriers and unnecessary misunderstandings.

Even if there are arguments of wanting to become more Agile, P3 added that Waterfall-based project management is one of the best options on the condition that the project scope is fixed, and no external changes are allowed to affect the project result. An example given for such condition could be an amendment of the law where external influences are not allowed to affect the
implementation of the change. The agency does also have some restrictions in laws and regulations that need to be taken into consideration in their daily work, and which seems to be a good reason for using Waterfall-based methodology as it provides with a clear structure, an approximate budget, an approximate deadline, and a prediction of what the outcomes might be. Nevertheless, both P1 and P2 mean that the market is changing much faster now together with customer demands, and it is, therefore, more difficult to predict what the requirements and needs would be after some years or even a short period of time. One of the interviewees formulated as followed:

“My reflection after many years of working with organizational development is that there is rarely one method that fits all situations, rather, we will be better when we know how to decide which method should be used in order to achieve a certain value” – P6, the Swedish Tax agency, 2019.

Continuing, P3 brought up the importance of planning and executing from what the agency has, and not from what the agency wants. This mindset could have an effect where an example was given as if a Waterfall-based project does not reach different milestones it could be explained by different restrictions such as understaffed. Whilst for an Agile-based project, the work and delivery are planned from what the team has control over during the upcoming weeks. However, an Agile transformation does still have its risks and challenges, especially for an agency like the Swedish Tax agency who comes from a hierarchical monocentral setup and is at the same time a public agency bounded by regulations, laws and financial restrictions. Thus, one of the challenges with a transformation is that there is a very low tolerance for failures since everything they do is financed by the citizens' taxes. Another challenge is the mindset of the managers, leaders, and coworkers; if everyone’s mindset is resistant to changes, then there is no point in changing the current framework (P1). Furthermore, the Swedish Tax agency is considered to have a good reputation, and to implement a new framework where the agency needs to drop down what they have done for a long time is challenging as well.

The agency has also mentioned wanting to meet customer demand at an early stage. To this, P1 added as following:

“If compared with other public agencies, we might be considered as being at the front edge. But if we compare us to for instance Klarna [IT company that provides payment solutions for the e-commerce industry] then we are not that flexible or fast when it comes to customer convenience” – P1, the Swedish Tax agency, 2019.

By trying to be more customer-centric means a huge difference for the Swedish Tax agency. Even if they do monitor and collect data from their customers, they are not so good when it comes to using this information. This could be due to no common structured work and that the agency is divided into different departments. For instance, the customer-relationship department who is responsible for the customer experience or the level of customer interaction has a great understanding of what the customers like and do not like. But the customer department is not the owner of the services or products, hence, it is difficult for them to make any changes in the system.
Further on, according to the interviewees, an Agile transformation may need a cultural change within the agency as for example SAFe, the framework does not have any project leaders which the Swedish Tax agency has had for the past decade (P2; P7). This means that some roles will disappear, and some new roles will emerge. With that, leaders and co-workers have to be retrained, the agency’s budget has to be divided differently, and the way of working towards goals will be changed. For this, P4 explained that these changes are needed because the traditional workflow is based on financing a project or a management object, whilst the framework of SAFe is based on financing a capacity. However, when comparing the traditional way of working and the concept of Agile, P6 explained that it can be scary for employees to start planning semiannually instead of annually or even years ahead. For those that are used to planning ahead, it could give the impression that things must be delivered to a shorter time as they are expected to continuously deliver results. But P6 means that the results do not need to be huge since small improvements can also be considered valuable results. Hence, by working with shorter cycles, the effects are not great but continuous. P4 adds that it is always easier said than done when it comes to changing something, it requires a process of constantly working on the object and gradually improving it.

The shortcomings in communication within the agency were also brought up during the interviews. Some of the interviewees experienced a lack and unclarity in the communication and some did not, although SAFe includes a PI planning where a two day meeting is scheduled after each period of 10 or 15 weeks, which enables open communication and discussion for both managers and coworkers. The PI planning is believed to be a useful tool that might help and improve the communication problem and prevent misunderstandings. However, it is not enough to be a solution for the whole communication problem within the agency. Both P2 and P3 mentioned that transforming the agency’s hierarchical structure of communication into a more horizontal system could be an option, but due to for instance a restricted budget and many years of hierarchically structured communication, it remains a huge challenge and more investigation into it. Lastly, financial reporting practice is another challenge. The Finance and Control department wants to know how and on what projects the funds are used, therefore, the agency needs to always be able to let the finance know about the work and its results. When working with Waterfall-based projects, an approximate time, budget, and what product or service will be created from the project can be announced to finance. However, when working Agile it is not as easy to know such information because the end-product or end-service is dependent on the value the agency needs to create. As P7 mentioned, one amongst all challenges during the digital trip is to know how much and to which extent you should have control over your work. This is because working Agile means to not have too much control but rather let it take form on the day, but as a human being and an agency or privately-owned business you want to have control in order to, for instance, know how resources are used. It becomes especially important for the Swedish Tax agency as it is taxpayers’ money and not privately-owned money. Therefore, the work needs to be followed up in some way.

4.2 Findings of the Swedish Migration agency

When conducting the benchmark with the Swedish Migration agency, the agency was also identified to have been using Waterfall-based project management for some years and is still used
in some parts of the agency today. Just like the Swedish Tax agency, Waterfall approach has provided good control, well-structured project plans and clear instructions about what needs to be done as the projects processes. However, project management with Agile approaches have been present to a small extent but there is a will to expand it. This has led to many considerations, thoughts and discussions about this where more are presented in the following section 4.2.1 and 4.2.2.

4.2.1 Waterfall approach within the Swedish Migration agency
When it comes to the Swedish Migration agency, both P8 and P9 agreed that the agency has had many projects based on the Waterfall approach. In the same way that the Swedish Tax agency does, the Swedish Migration agency has also used PM3 in some of their works. However, instead of using Pejl for managing the projects, the agency uses Excellence in Project Management (XLPM). XLPM was roughly described as a framework for managing and leading tasks, projects, and project portfolios. Hence, it was considered being quite similar to Pejl. When asking more about the past projects, the time-span and amount of involved people for a project could vary considerably depending on project-type, but an approximation of 4-12 months was given whilst the amount of involved people was more difficult to answer. The traditional way of working was identified with some main challenges during the years which were projects being large in size, time-consuming, costly, and not achieving the expected result.

4.2.2 Agile approach within the Swedish Migration agency
The Swedish Migration agency is undergoing a reorganization at the moment. In comparison with the Swedish Tax agency, there is no clear announcement of an Agile transformation but rather something that has been used in some degree and will continue to be implemented gradually. When the researchers asked about if the agency wants to become more Agile, the interviewees agreed on that at least the IT department wants to, and is currently working on, becoming more Agile. This was partly due to the challenges mentioned in the previous section, and that such projects are considered unpredictable both in how such results will turn out and what resources they will need. There is a belief amongst the interviewees that working with Agile development method could increase the possibility of working together and make decisions as late as possible. However, why the agency has historically worked with project forms and that there today still is a group of people who still like it could be due to the trust to project being solution to problems. But P8 mean that it is also important to work towards the same goal and the same impact goal. To give e-service as an example, a project may let you produce the service, but if the service does not fulfill the demand or it is unusable due to it being too complex or impractical, it will then be considered as not having achieved the initial goals.

Although the Swedish Tax agency has chosen SAFe as their framework, the Swedish Migration agency is not planning on implementing SAFe in its pure form. For this, P8 described that they instead are trying to implement their own development process which is inspired by SAFe. As mentioned earlier, Agile methodology has been present since many years before where for instance Scrum has been used within the IT-department and for some projects. For this, P9 brought up a current project as an example where they are working Agile but also cross-functional. Therefore,
the implementation of their own SAFe inspired framework can be seen as further development. However, as mentioned, the Swedish Migration agency is currently undergoing a change within their organization and has recently identified that the IT support also needs to adapt to it which they did not think was needed before. Hence, just like the case of the Swedish Tax agency, the Swedish Migration agency has seen the importance of good cooperation of IT-department and the rest of the organization, and the importance of having cognizance of what others within the agency are doing.

There are a couple of challenges identified when it comes to project management, whether using the Waterfall approach or Agile approach. Even if there is a will of becoming more Agile and use the method to a wider extent, it is tempting for employees at the agency to fall back in the paths of Waterfall. One of the interviewees formulated this as following:

“For an agency to know what something would cost and when you can get it as well as when you are done, I know it is tempting for the client. At the same time, there are always delays, it is difficult to foresee the exact cost especially when it comes to IT-development as it requires a lot of time and depends on who is doing it and what the prerequisites are as well as how complex it is. It is difficult to foresee.” – P9, the Swedish Migration agency, 2019.

Furthermore, P9 mentioned that the Swedish Migration agency does also have different kinds of projects, where some are based on amendment of laws with clear deadline and no external influences are allowed to affect the project results or for instance the interpretation of the laws which sometimes can take time. Whilst some are development-based and more unpredictable, where some projects may be better fit with an Agile project management method, and other with a non-Agile project management. However, when something such as a project will proceed over one year or so, P9 discussed that it does not necessarily need to be set up as a large-sized project to work with but could also be divided into smaller cycles. Because even if the work is set up as a project, it is still a set of different steps that could be divided and then be Agile within these divisions. However, P8 adds that it is difficult to know what competencies are needed, and should be included, in each team in order to enable an Agile work, and that some competencies are considered rare. An example given was; if competence such as jurists who know all the laws and regulations are scarce, there is no guarantee to work close or in the same team with someone who has such competence and knowledge (P8). Hence, it would affect the Agile working.

As the Swedish Migration agency is not business-driven they do not have the same continuous pressure of being outcompeted, but most importantly the agency has laws and regulations that they must comply with. However, even if the Agile method is not preferable to be applied to the whole agency, the interviewees believe that the agency can become more Agile and use those methods to a wider extent for project management than what it is used today. But it is important to have the same definition of what Agile is and then setup a common framework in order to have common understanding and common goals to work towards. By setting up common goals the employees will know what the agency wants to achieve, and P8 used a metaphor to support his argument; “It is like you know that the left hand and right hand have to cooperate together in order to get the full
effect”. However, changes, such as becoming or working more Agile, take time (and you need to be brave), and one of the interviewees expressed it as following:

“Cultural changes and any other changes take time especially when it comes to larger agencies such as the Swedish Migration agency and the Swedish Tax agency, it takes time ….” – P8, the Swedish Migration agency, 2019.

Furthermore, just like the case of the Swedish Tax agency, there are challenges regarding the financial reporting practice where the agency needs to be able to answer and follow up questions in order to be eligible for receiving financial support. Lastly, implementing the Agile development method means cultural change where some roles will be eliminated, some will be less important, and working with cross-functional teams will become more common. However, such changes can be challenging and will require time and effort for the agency to make their employees get used to the new way of working.
Summary of chapter 4

This chapter presents the findings from the interviews with employees from the Swedish Tax agency and the benchmark made with the Swedish Migration agency. The interviews were mostly focused on project management methods that the agencies have used, been using, and intended to adopt. Likewise, challenges that the agency has encountered when using their old project management methods, as well as the new ones, have been questioned. As a result, it shows that the two agencies share many similarities where they both have been using Waterfall-based project management for many years. Even Agile methodologies such as Scrum has been used within both the Swedish Tax agency and Swedish Migration agency to some extent for some time. However, it was clear that many of the interviewees were positive towards the decision of adopting Agile methodology to a wider extent. Despite the Waterfall methodology having provided good control and well-defined project plans, many projects seemed to have faced some common challenges which led to cost- and time overruns, as well as some projects not delivering the expected aftermath. Nevertheless, the adoption of Agile project management is not an impeccable solution since new challenges will arise and replace the old ones.
5. Analysis

The analysis presented in this chapter is based on the literature reviews, the conducted interviews with the Swedish Tax agency and the benchmark study with the Swedish Migration agency.

The research purpose was to analyze to which extent Agile can be implemented within public agencies as well as to identify the challenges that may occur when performing an Agile adoption. A case study was undertaken with the Swedish Tax agency since they have quite recently decided to undergo an Agile transformation and adopt the framework of SAFe.

To begin with, it is evident that the Swedish Tax agency has used traditional Waterfall-like project management for their past projects, and such a method is known to have a testing phase set at a late stage of the project. This means that feedback and changes are not provided until the product or service is almost “done”. As a result, the output from the project cannot guarantee that it will achieve the expected value as the expected requirement can be unstable and change could occur during the time the project processes. This explained why some of the past projects resulted in deteriorated value creation at the delivery. Even if changes can be done, then the project team will need to go back to the very first phase of the process and add new requirements (Stober and Hansmann, 2009), which then indicates the work has to “start over”. Therefore, due to the lack of iterative work, such projects could become both costly and time-consuming.

Furthermore, in order to mitigate the risk of a project’s outcome being obsolete caused by the project being operated under a long period of time, the Swedish Tax agency has decided to adopt SAFe as they believe it could be the key for them to work against this problem. The method allows them to produce a small product at a time and by doing that, they can check if the requirements and demands are still relevant or need to be redefined. However, even if the agility has been present within the public agencies, for instance, the Agile framework Scrum was used in the projects KUPP, MUPP, and IDAG. The agency is still considered not as iterative and could become Agile to a wider extent than what it is today. By applying SAFe to the Swedish Tax agency, it is believed to not only let the agency have a common framework that could help them to minimize miscommunication and misunderstanding when working with Agile methodology but also allow them to work more iteratively where they can ensure the value-creation.

Worth mentioning is that, during this study, the researchers did a benchmark towards the Swedish Migration agency as the researchers thought that they had come further regarding an Agile adoption. Surprisingly, the study later showed that the Swedish Migration agency is currently in the same phase or maybe even a few steps behind the Swedish Tax agency. There were many similarities such as both agencies had been using Waterfall-based project management, similar challenges from previous projects in terms of high cost, time-consuming, and not achieving the expected results. For both agencies, there is a will of using the Agile methodologies to a wider extent and the same challenges were identified for the Swedish Migration agency when applying Agile into their organization. Therefore, the analysis may regard the Swedish Migration agency as well.
For a public agency, or even the private sector, an Agile transformation will imply risks and challenges, especially for the Swedish Tax agency that is bounded by regulations, laws and financial restrictions. Additionally, since everything they do is financed by the citizens’ taxes, the level of tolerance for failures when implementing such changes is low. Therefore, from the empirical study and literature review, a number of challenges of applying Agile methodology in the Swedish Tax agency have been identified and listed in Table 5 below.

Table 5. A summary of the identified challenges with adopting Agile project management in a public agency’s environment.

<table>
<thead>
<tr>
<th>Source of the challenge</th>
<th>Description of the challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mindset</td>
<td>Employees being too comfortable with old methods</td>
</tr>
<tr>
<td>Cultural change</td>
<td>Staff having difficulty committing to the new working culture</td>
</tr>
<tr>
<td>No “one-size-fits-all”</td>
<td>Agile method is not a “one-size-fits-all”, neither is the Waterfall method</td>
</tr>
<tr>
<td>Large size projects</td>
<td>Some projects could get very large in size during the time the project proceeds which affects the way of working Agile</td>
</tr>
<tr>
<td>Bureaucracy and regulations</td>
<td>Everything the agency does, needs to be clearly reported and documented, which might inhibit the agility</td>
</tr>
<tr>
<td>Lack of competencies</td>
<td>Some competencies can be considered rare, hence there is no guarantee for each team to have all competencies that are needed</td>
</tr>
<tr>
<td>Financial reporting practices</td>
<td>Financial department demands to know how resources are used and what results are expected from the investments</td>
</tr>
</tbody>
</table>

A total of 7 different challenges were identified. The 7 challenges will be further analyzed in the following sections.

5.1 Mindset

From the collected data, it was clear that the Swedish Tax agency has used the Waterfall project management method for many years and operated a few other methods such as PM³, and Pejl, and also the agile-like practice, RUP. Despite RUP is a process framework that is supposed to provide an iterative and incremental approach to the workflow (Shuja and Krebs, 2008), RUP can sometimes be difficult to understand due to it being too abstract and complex (Lunell, 2003). This is due to RUP being rich in information and too standardized as it is supposed to be adaptable for many different types of projects and which consequently makes it difficult to determine which information to use for a certain type of project. Additionally, descriptions provided by RUP are too general making the translations of how this method works differ depending on the developers. However, even if RUP is supposed to provide an iterative and incremental approach, the workflow within the Swedish Tax agency was still leaning more toward the Waterfall-based and this could
be explained by the evidence that many employees within the agency have been using the traditional methodology for a long period of time. The employees are being too comfortable with the old methods and in order to make them get used to the new one, it will require considerable time and effort. Even if the will of becoming more Agile, which is clearly stated in their operational plan 2018-2022, the transformation is still obscure according to P5, one of the employees from the agency.

Changes take time, but P1 said, the mindset has a crucial role when it comes to making changes; because if the mindset is still “old”, then there is no meaning of implementing any change. This is because the implementation of change cannot only be talked about, actions are also demanded in order to reach an effect from the change. One's mindset could change depending on if someone could convince or for instance if the environment somehow forces the organization or employees to change their mindset. Furthermore, the Swedish Tax agency was considered of having a good reputation. Therefore, this could be another factor that affects the perspective of an Agile adoption where the current situation can be seen as a safe zone or a comfort zone for the agency. However, P7. argued that they had to be braver and try new things such as working with a new framework. This could be interpreted as that they tend to stay in their comfort zone, and as a governmental agency, the competition is not the same as for instance in private businesses. Moreover, the Swedish Tax agency is there to establish services that would facilitate the process of for instance paying tax and population registration, and in order to make it more convenient for their users which are the whole Swedish population, the agency will need to meet their demands. The agency has mentioned that they want to meet the user demand at an early stage which was not really considered before, and P2 mentioned that the world is changing much faster together with the user demands. Hence another factor to why there is a need for becoming a little braver and stepping out of their comfort zone.

5.2 Culture change

Migrating from the Waterfall approach to the Agile approach implies a cultural change. A new approach means a new way of working, hence the perspective and work behaviors need to be unified. The fact that the Agile method is not only about a method that streamlines a working process, but it is also about a working culture where everyone who is sharing the culture needs to have the same mindset about how work should be performed. There is evidence that the Swedish Tax agency has a PI planning where a two day meeting is scheduled after each period of 10 or 15 weeks with the purpose of having open dialogue and discussion for everyone from all departments. Granted, this will improve their communication and renew their mindset to some degree as it is a good opportunity to share what team A has done, how and which method team B has used and so on. However, if the Swedish Tax agency is to become more Agile, then there needs to be a greater scaled internal training for their personnel where the agency clarifies that they are now leaning towards a more agile working culture, and ensures that everyone within the agency is aware of the transformation. Personnel training could be the key to ensure the successful implementation of Agile methodology as everyone within the agency will be pronouncedly introduced to the new methodology and thereby get a clear vision of what direction the agency has taken. Additionally, when using Agile project management, some roles will disappear whilst some new ones will
emerge. For instance, SAFe does not have any project leaders which the Swedish Tax agency has had for the past decade (P2; P7). This will have an effect on how the employees’ mindset and the working culture, as for instance one's previous role, responsibilities, and assigned tasks will be changed.

Furthermore, wanting to meet the customer demand at an earlier stage does not only affect the employees’ perspective while working, but also their way of working. The Waterfall approach defined by Royce (1970) is considered structured where each steps in the project plan is considerably strictly followed. Whilst the Agile framework of SAFe works with value streams and an iterative workflow (Scaled Agile, 2018). By implementing the Agile framework into the Swedish Tax agency may increase the possibilities for value-creation and meeting the customer demands. However, in order to change the way of working where the employees for instance should plan semiannually instead of annually, which they are used to, can be challenging (P6). Before, the Swedish Tax agency was expected to deliver a few but larger results, but with the Agile framework it implicates that they need to continuously deliver value. However, the continuously delivered results do not have to be any great solution as the continuous flow of value may also be equal or even have a greater value-creation than one final result. Additionally, much of a changed working culture does also have to do with how the personnel react to it, see also section 5.2.

5.3 Agile is not a “one-size-fits-all” method

Continuing, the fact that the Swedish Tax agency realizes there have been some shortcomings resulting from their past projects, where some examples were shortly described in section 1.6, and that they need a transformation in their work way as well as project management corresponds well to previous studies of Cockburn (2002). Where the studies of Cockburn (2002) showed why it is important to assess and renew the way of working. The shortcomings that were identified in this research were, for instance, the project is large in size causing the project to become too time-consuming and sometimes exceed the budget. However, as different project management types seem to be a better fit for different projects and studies of Cockburn (2002) stating the importance of assessing and renewing the work way, P6 discuss that knowing how to decide which method to use for certain projects and to achieve a certain value is an advantage. Hence, knowing which method is better fit for certain projects and work is a challenge itself. Therefore, the five-step risk-based assessment provided by Cockburn (2002) would be a great tool for developers to determine which method would be more beneficial for a certain type of project. Adding to that, the model provided by Roses, et al., (2016) can even be used as a foundation when assessing the degree of favorability for different sets of conditions. Furthermore, the fast-changing world and higher expectation from the citizens as pointed out by P2 is also a plausible explanation for the agency experiencing a need to work more agile. This demonstrates that the agency has to carefully consider which methodology they should use and which conditions they should prioritize in order to achieve the best possible outcome before starting a project and to meet the expectations of the citizens who are also the main users of their products and services.

In addition, when implementing the Agile adoption to the Swedish Tax agency, it needs to be implemented to both the IT department and to the operation function. The journey has to be
performed together in order to work towards the same goals and be able to do the same prioritizations. This in turn increases the possibilities of achieving the best effect and value-creation. However, there seems to be an agreement about Agile not being a "one-size-fits-all" method as the interviewees pointed out that they have officially selected SAFe as their framework for Agile work. However, on the other hand, they argued that they will still be using Pejl. The decision is quite plausible as the Swedish Tax agency does not only possess IT-related work and big data system, but they also deal with other works such as amendment of the law, local change and a massive of administrative work. Such works are not preferable for being operated iteratively due to their requirements are quite fixed and stable and therefore, using the Waterfall approach is a more efficient way to carry such projects according to Stober and Hansmann (2009). Conditions that were identified by Kaczorowska (2015) should therefore be taken into consideration before putting any methodology into use.

5.4 Large size projects

It is evident that the number of people involved could differ from approximately 20-200 and the timespan for each project differs accordingly, but usually around 0-3 years (P2; P6). The number of people involved in each project seems to vary depending on what kind of project it is, and it might increase during the time the project proceeds. This was due to people being added over time into the project, when they, for instance, realize that some competencies are lacking, see also section 5.6 regarding lack of competencies. According to Stober and Hansmann (2009), it is almost impossible to carry out larger projects or projects with some level of innovation without any change. Further, Karabulut and Ergum (2018) stated that larger projects could require bigger and more complex coordination. This could be interpreted as that large size projects with more people involved may affect the projects mobility and in turn, also affect the iterative work. Further on, according to Cockburn (2002), and Boehm and Turner (2003), large size projects are categorized in the home-ground of plan-driven projects and from the graph in Figure 6, past projects that have been operated within the agency have a tendency of leaning more towards a more plan-driven due to their characteristics as being large in size, heavily documented, having high criticality and mixed competencies. Thereupon, if the agency desires to adopt the Agile method to its project management as well as other development activities, they will need to alter the size of their project such as dividing the project into smaller sub-projects or divide all work into cycles and from there apply the concept of Agile method and allow an iterative workflow and continuous deliveries. This, in turn explained why P9 argued that it is not necessary to set up large-sized project but rather divide the different steps into smaller cycles. However, if there are any reasons of keeping large-sized projects, then applying the Agile methodology to the whole project might not seem very optimal. In this case, dividing up the project into smaller sub-projects and then assessing and applying the Agile methodology into the suitable ones might be an option. Hence, it is maybe not impossible to carry out larger projects with iterative workflow, even if larger groups of people may be not as mobile as smaller groups.
5.5 Bureaucracy and heavy documentation

According to Cockburn (2002), having a more “thriving on chaos” culture could boost up the agility, but it seems to be inappropriate for a government agency like the Swedish Tax agency or the Swedish Migration agency, not only because of not having any competitor that could boost up the agility but also because everything they do have to be strictly related to existing tax laws and therefore bureaucracy and heavy documentation are unavoidable. This is seen as falling back to the traditional Waterfall methodology where there requires a high degree of documented plans and quantitative control (Royce, 1970; Cockburn, 2002; Boehm and Turner, 2003). In other words, bureaucratization within public agencies tends to bend the rule of the Agile project management (Kaczorowska, 2015). Adding to that, Roses, et al., (2016) has further pointed out that lightweighted documentation has become a challenge when adapting Agile practice in public agencies because knowledge would not be found when a team has to for example relocate. Documentation on what has been done, why a certain decision has been made would then be found nowhere, hence, finding a balance for documentation remains a challenge for public agencies.

5.6 Lack of competencies

It is clear that the agencies have worked and are still working with projects of different sizes where the amount of involved people could vary from a few and up to hundreds. When starting a project, it is not granted that all the needed competencies will be available during the project. Therefore, it can happen that during a project, the team lacks some competencies that are needed in order to complete a work, people with these competencies could be added even if it meant that the project would grow larger in size (P6). However, P8 mentioned that some competencies could be considered rare which in turn could affect the Agile working. Because if some competencies are missing in a team and it is difficult to work close to the needed competence, the work could take longer time. For example, you may need to wait for the person who possesses the wanted competence or wait for confirmation of something before you could continue with the work. Therefore, working closely with all competencies is essential not only in order to work with Agile project management but also in order to work towards common goals. P8 argued that the full effect could be attained when the left hand and right hand cooperate together. Hence, good cooperation between team members together with a full package of all needed competencies is advantageous in order to reach a full effect of the work that is being done. However, finding the right competencies and gather them all into the project teams has already been a challenge for the Swedish Tax agency. For instance during the past projects KUPP, MUPP, and IDAG, one of the shortcomings was finding the right competencies and in some cases the person that got the right competencies was maybe lent out to other projects. It could therefore also be interpreted as that this challenge does not only arise with the adoption of Agile project management and within the public agencies, but also to other project management methods and the private sector.

5.7 Financial reporting practices

Furthermore, any work or project will require financial support and in order to be eligible, the Finance Control department requires a detailed description of how the funds will be used and what
they will be used for. Therefore, the project needs to be able to tell and provide the Finance Control department with clear project planning. However, when working with an Agile approach, project planning is usually not entirely fixed in order to cope with the rapidly changing environment and continuous improvements through feedback (Dybå and Dingsøyr, 2008). Thus, it could be difficult to provide the Finance Control department with such planning details in order to be eligible to receive the financial support. Similar explanations were also found amongst the collected data where the end-product or end-service from Agile working is dependant on the value the agency needs to create at a specific time, hence it becomes difficult to announce to the Finance Control Department what result will be provided from the funds. However, Agile methodology aims to perform control and testing continuously during the process in order to avoid mistakes being too late to fix (Dybå and Dingsøyr, 2008). By doing such control and testing, the work might be able to be followed up and reported to the Finance Control department. But for this, it has to be confirmed by the Finance Control department that it is granted to continuously report to them instead of providing all information already at the beginning. Another suggestion is to make the project’s planning details with good cost estimation at the beginning or check up with the Finance Control department regarding the inspection time and then synchronize the time with the project. However, as P7 discussed, it is difficult to know how much and to which extent you should have control over your work. Because when working Agile you want to let the result take form on the day, but as a human being and a public agency it is tempting to have control over the work but also important to let the Finance Control department know how the funds are being used as every action they make is financed by the taxpayers.

However, another issue is that it could take long time for each financial report to be inspected and approved due to the Finance Control department might be working on multiple other financial reports from other projects at the same time. Thus, this will impede the agility and decelerate the working process. This also explains why previous research done by Kaczorowska (2015) categorized the project financing method as one of the conditions that has to be analyzed when considering which methodology should be used in public agencies.

**Summary of chapter 5**

This chapter identifies and analyses the challenges that may occur when the agency adopts Agile methodologies for project management. The challenges are identified by analyzing both the empirical data and the reviewed literature. It is found that the agency could implement and use Agile methodologies for projects to a wider extent than what is done today. However, there are some challenges in becoming completely Agile as some projects are a better fit with Waterfall-based approaches. Further on, during the analysis, it was found that the Swedish Migration agency which was benchmarked is in quite the same phase and had many similarities regarding an Agile adoption.
6. Conclusion

This chapter presents the conclusion of the study and highlights, as well as summarizes, the important aspects of the analysis. Further, implications and a proposal to future work are articulated at the end of this chapter.

6.1 Conclusions

As the world is continuously changing due to different factors, and changes tend to occur more frequently during the projects, there is an interest for the public agencies to migrate from Waterfall methodology to Agile methodology. Therefore, this study is supposed to imply a gap-filling contribution as there seemed to be a gap when it comes to applying Agile project methodology to a wider extent within public agencies, with the report aiming to analyze the adoption of Agile project methods in public agencies and identify the challenges of performing the adoption, which in this research was delimited to the Swedish Tax agency. This study expects to be used as an underlying foundation for other Swedish agencies when considering applying Agile project management in greater extent to their organizations. In order to know to which extent Agile project management methods can be implemented within the public agency, the challenges of doing such were identified, where a summary of the identified challenges are listed in Table 5. Moreover, as this study’s subject was considered broad and complex, and required in-depth knowledge, a qualitative research approach was used. A case study was done for this study where data was collected through interviews with people who had, or were, experiencing the phenomenon. However, as such research method can lack rigoroussness and objectivity, a triangulation of the collected data was done and reviewed in conjunction with the reviewed literature.

From the analysis of the empirical data and reviewed literature, the study identified 7 different challenges provided from agility which can be summed up as following;

**Mindset**
Changes start within. However, as the traditional methodology has been used for a long period of time, and employees from the investigated agency are comfortable of using it. It would be challenging to adopt the Agile methodology in an instant. People will need time to adapt themselves to the new work way. For that account, a working environment where employees are continuously being reminded about the Agile methodology will play a crucial part for triggering the agility within a workplace.

**Cultural change**
Agile is also about a working culture. Regardless what methodology is used within a public agency, the working culture is also important as everyone who is sharing the culture needs to work towards the same goal and have the same mindset about how work should be performed and have the same prioritizations. For a public agency who have been working with a Waterfall methodology for a long time, adopting the Agile methodology may bring some changes in the working culture. However, adopting to transformations take time and requires a process of continuously working on it and improving it, but how the personnel react to such changes is also important.
Not a “one-size-fits-all”
Being able to decide which project management method should be used for a certain type of project may not always seem easy. Some projects might work better with an Agile methodology and in the meantime, some might obtain a more optimal result with the traditional way. Hence, it is a challenge for the agency to assess and decide which method to use before starting a project.

Large size projects
From both previous studies and empirical studies, it is clear that Agile methodology is not the best candidate when it comes to large-sized projects. Therefore, it is important for an agency to decide, whether to divide up the project into small cycles/sub-projects and then apply the Agile methodology into suitable sub-projects or keep the original size of the project and assess which method to use.

Bureaucracy and regulations
Bureaucratization and regulations have a tendency of bending the rule of the Agile methodology as it obstructs oneself to think freely and “thrusting on chaos”. This, seems to be inappropriate for a government agency because the agency is strictly related to existing laws and regulations. Hence, documentation and obeying the laws are unavoidable. Therefore, finding a good balance between documentation and being Agile remains a challenge for the agency.

Lack of competencies
All competencies are not always granted to be available for a project as it is difficult to know exactly which competencies are needed for a whole project at the beginning. Hence, when a competency is realized being missing from a team during a project, it would obstruct the agility.

Financial reporting practices
In order to be eligible for funding, a detailed description of how the provided funds/resources will be used and what they will be used for is required. This, in turn becomes a difficulty for those who aim to work with Agile methodology because the project planning is usually not completely fixed in order to scope with instant changes that might happen during the project.

Despite the challenges provided from agility, there were challenges with the agency’s traditional approach as well. The identified challenges provided from the traditional approach were projects being large in size, time-consuming, cost-consuming, and not achieving the expected value-creation. It was important for the agency to make improvements because if one project did not work as planned it could affect other projects within the agency, but most importantly, the money is provided by the taxpayers. Therefore, an interest in adopting an Agile approach has evolved. However, the Waterfall approach still has some strengths and is considered appropriate for some non-IT related projects. Therefore, the agency should not become completely Agile, but rather keep both project management methods that are Agile and Waterfall. Hence, it is important to do a risk-based assessment in order to know what project management method should be used on what kind of project or work.
Therefore, the main conclusion is, even if there are some challenges, there are still possibilities for the agency to become more Agile with its project management or management of work cycles than what it is today, especially within the IT department and IT related projects and/or tasks. It was also identified that the agency has possibilities of becoming more Agile at an organizational level with its process management, but this was not focused on during this investigation. However, the agency is suggested to not become completely Agile and need to know when to use Agile project management and when to use Waterfall project management.

6.2 Implication on industrial level

The findings of this research tell that there are challenges for the Swedish Tax agency when applying Agile methodology. The agency should not only work with Agile project management methods but should also consider other project management methods due to the fact that they have different project types. However, there are possibilities for the agency to become more Agile than it is today, therefore, following the recommendations might potentially help the agency to achieve its set goals and meet the citizens’ expectations. Besides, some aspects of this study might be helpful for other public agencies as well as privately-owned companies that have been embedded by the traditional methodologies for a long time and are willing to adopt the Agile practices.

6.3 Future work

This research had some limitations, but some interesting aspects that could be of interest for future work arose during this research. As both the Swedish Tax agency and the Swedish Migration agency have heavy systems and working with a considerable number of different data, especially the Swedish Tax agency as they manage civil registration and collect taxes, it would be interesting to investigate how Agile other public agencies could become. To give an example, both the police and the Swedish Transport Administration (in Swedish: Trafikverket) are also governmental. The police work revolves around humans whilst the Swedish Transport Administration work revolves around the planning of the transport system for road traffic, rail traffic, shipping, and aviation. How Agile can they become, and what would the effects be from it?

Furthermore, the time given for this study was limited, otherwise it would be interesting to sort out and identify all the different work, either project or other missions, the Swedish Tax agency is doing and trying to create a guideline in which could be of help for the employees to know and easier to address when to use a specific development method. Also, many of the mentioned benefits from implementing Agile, either if it’s SAFe or any other framework, the benefits seem to have many similarities. Therefore, it would also be interesting to study what unique benefits each Agile framework may provide and if SAFe is the most beneficial Agile framework for the Swedish Tax agency or any other Swedish agencies.
Summary of chapter 6

The last chapter presents the conclusion based on the analysis chapter which answers the research questions and hence, fulfill the purpose of the study. An Agile adoption for the Swedish Tax agency would imply some challenges where a number of different challenges were identified from this study. It was further suggested that the agency can use the Agile methodology to a wider extent than what is done today. Suggestions on further investigations that could be of interest or to complete this investigation limitations are also briefly discussed in this chapter.
References

The references used in the report are presented here and have been divided into the type of source they represent, either scientific articles or sources from different websites.

Scientific articles


**Internet sources**


Appendix I: Interview guide

This appendix outlines the different themes and questions covered during the interviews. This was used as a guideline and were then further discussed with individual follow-up questions. All questions were not discussed with all interviewees as it depended on their role and competencies. The interviews were held in Swedish, therefore the questions have been translated to English in this appendix.

Introduction

- Could you please tell us about yourself, your role and responsibilities within the agency?
- Which department are you from, and what are the departments main tasks and how to support the agency?
- Generally, how do you see the Swedish Tax agency situation today?

Past and current (with focus on Waterfall development)

- How has the agency worked and how does it work today?
- What models, methods or frameworks has the agency used?
- What are the pros and cons with the models, frameworks, methods the agency has used and/or are using today?
- Do you consider the agency efficient? What could be improved?

Future desire (with focus on Agile, especially the framework of SAFe)

- As we have been informed and from what we understand, the agency wants to become more Agile. What are your thoughts about it?
- What was it that made you/the agency decide to adopt Agile?
- Is an Agile transformation necessary/important for the agency? And why?
- How far has the agency come with implementing Agile framework?
- Who are included in this transformation? For instance, does it only include IT department or IT related tasks? Or does it also include other departments as well?
- What challenges have aroused when becoming or wanting to become Agile?
- Do you think it is necessary/important for other agencies to also become more Agile?
- Has the agency worked with Agile methods before or is it just recently?
  - If the agency has worked with Agile before, what have been the pros and cons from it?
- A question specially for the Swedish Tax agency: The Agile framework of SAFe is the one your agency has decided to adopt. Why SAFe?
- A question specially for the Swedish Tax agency: To which extent can this framework (SAFe) be adopted? Because as an agency, you may have some restrictions in regulations and laws.

Projects and project management

- What size does the projects have? An estimation of how many people are involved
● How long does a project take? An estimation of the time-span
● Could changes occur as the project proceeds? Or are the requirements/project requirements determined?
● If there is a grade from 0 to 10, where 0 represent “follow orders/policies to great extent” and 10 represent “thriving on chaos”. Where would you place the agency and its projects?
● If a project did not went as expected, what are the consequences?
● How are the teams gathered considering competencies? For instance, in each team, does everyone have different competencies or are they of same expertise?
● Is it common that projects do not achieve the expected goals or does not goes as planning? If yes, then why and to what cost?

Others
● As we have understood, all departments work individually to a great extent, is this correct?
● It there a need of changing it and maybe work more iterative or horizontal than vertical?
● What do you think about the internal communication?
  ○ If “bad”, do you believe becoming Agile will improve it?
● If you were allowed to, what would you do in order to improve the agency’s current situation? For instance, would you let the agency migrate to Agile or keep Waterfall but implement improvements?
  ○ This question could also be formulated as: what are your thoughts about this Agile transformation?