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Agile Methods in Signicat

NTNU
Norwegian University of
Science and Technology

SIGNICAT
Trusted Digital Identity™

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Preface

This thesis is the result of a specialization project during the autumn 2020 and further work with the master thesis during the spring 2021 in the master's program Product Development and Production at the Norwegian University of Science and Technology, NTNU. The thesis was completed in the spring of 2021 and constitutes 30 credits in the course TPK4920 - Project and quality management – master thesis.

In connection with the application process for the master's thesis I was introduced to Signicat, an exciting company that has experienced great growth during the recent years and operates in a highly relevant and interesting business area. Although the starting phase of the project was marked by a worldwide pandemic with COVID-19, this had a minimal impact on the work with Signicat. The pandemic rather led me to the realization of how future-oriented the company is, as it has experienced continued growth during the period.

The background for the thesis is the desire to map the possibilities which exist when using agile methods in projects as the project methodology continues to become more widely used in different companies, including Signicat. My motivation to work towards a more agile approach in companies has grown in step with the thesis document.

I would like to thank my supervisor at NTNU, Bjørn Andersen, for valuable input and feedback during the process. The advice given has been structured, educated and has been important for the work done. Furthermore, I would like to thank all participants in Signicat for their contribution in the form of reflective interviews, useful documents provided and insightful conversations. This input has been crucial for completing the task. This especially applies to my two external supervisors in Signicat, Gisle Aasgaard and Kristine Buan. Both Gisle and Kristine has provided great support and useful information during the process. I would also like to thank my family who have proofread the thesis and supported me during the entire process.

Trondheim
June 2021
Kamilla N. Saltermark

Summary

In a complex world and a society under constant growth and development, the need for adaptation is crucial. Whether a company is able to respond and quickly adapt to change are factors which can distinguish between success and failure. The purpose of the thesis is to map whether agile methods, which have previously been a central characteristic in software development, can be used in other departments and business areas as well. The thesis addresses the following defined research questions:

- What are the similarities and differences between FTN and MitID?
- What are the characteristics of Signicat's agile approach?
- What can Signicat learn from MitID for future projects?

The research was conducted as a qualitative case study. This included a literature search, nine semi-structured in-depth interviews, getting information from informants within the company, a document analysis, as well as meetings and company visits at Signicat. The thesis aims to investigate the adaptation of agile methods in departments other than just the software department in Signicat. Furthermore, the thesis includes a comparison between traditional and agile project methodology to determine what fits projects best. The thesis gives an in-depth description of agile methodology, as three known methods are explained and compared.

The findings show that the implementation of agile methods in Signicat is an adaptation to the well-known method scrum. Scrum is characterized by more detailed planning and better management of increased product complexity. The method enables better communication within teams, gives a more retrospective perspective and splits tasks into sprints. Signicat is a company that has been growing rapidly during the recent years, not only financially, but also in number of employees. There has previously not been a need for a project methodology as the number of employees has been low enough for communication and collaboration to work without any further coordination or structure. However, with an increase in staff, they have realized that a more structured project methodology is necessary. This has led to a gradual transition into an agile approach. The uniqueness of Signicat is that this development has taken place more organically. The gradual transition has taken place as projects in Signicat have been performed with certain agile principles without the company being aware of it. Such a transition is highly unusual and makes Signicat different, as companies usually actively decide to introduce agile methods.

Sammendrag

I en kompleks verden der samfunnet er i konstant utvikling, er behovet for tilpasning avgjørende. Det å kunne respondere raskt og tilpasse seg endringer er faktorer som kan skille mellom suksess og katastrofe. Formålet med denne oppgaven er å kartlegge hvorvidt agile metoder, som tidligere har vært et kjennetegn innenfor programvareutvikling, også kan benyttes innenfor andre avdelinger og forretningsområder. Oppgaven søker derfor å besvare følgende definerte forskningsspørsmål:

- Hvilke likheter og forskjeller er det mellom FTN og MitID?
- Hva kjennetegner Signicat sin tilnærming til agile metoder?
- Hva kan Signicat lære av MitID for fremtidige prosjekter?

Forskningen er gjennomført som en kvalitativ casestudie, og inkluderer litteratursøk, ni semistrukturerte dybdeintervjuer, innsamling av informasjon fra informanter innad i bedriften, dokumentanalyse, samt møter hos Signicat. Oppgaven har til hensikt å undersøke adopsjonen og tilpasningen av agile metoder i andre avdelinger enn kun programvareavdelingen i Signicat. Videre er det gjort en sammenligning mellom tradisjonell og agil prosjektmetodikk for å avgjøre hva som er best tilpasset dagens prosjekter. Basert på funnene er det utført et dypere dykk i den agile metodikken, der tre særlig kjente metoder forklares og sammenlignes.

Rapportens funn viser at implementeringen av agile metoder i Signicat er en tilpasning til den velkjente metoden scrum. Denne metoden kjennetegnes av nøyere planlegging, samt hvordan man håndterer økt produktkompleksitet. Metoden tilrettelegger for god kommunikasjon innad i teamene, og gir et retrospektivt perspektiv underveis i prosjektene der oppgaver deles inn i sprinter. Signicat er en bedrift som har vært i kraftig vekst de siste årene, ikke bare økonomisk, men også i antall ansatte. På bakgrunn av dette har det tidligere ikke vært behov for en prosjektmetodikk, da antallet ansatte har vært lavt nok til at kommunikasjonen og samarbeid har gått «av seg selv». Følgelig har bedriften hatt en agil tilnærming uten å være klar over det. Med økningen i ansatte, har bedriften innsett at en mer strukturert prosjektmetodikk er nødvendig. Dermed har en gradvis overgang mot en agil tilnærming blitt innført. Særegent for Signicat er at denne utviklingen har foregått mer organisk, ettersom tidligere prosjekter har blitt utført med enkelte agile prinsipper uten at bedriften har vært bevisst på det. En slik overgang er svært uvanlig og gjør Signicat unik da bedrifter normalt aktivt bestemmer seg for å innføre agile metoder.

Table of content

1. Introduction

This thesis will address agile methods used in projects for the Norwegian company Signicat. Signicat is a Digital Identity Service Provider (DISP) and the leading provider of electronic identity and signature solutions both in Europe and globally that delivers authentication services to customers worldwide. From being a start-up in 2007, to the current year of 2021, Signicat has experienced great growth, both in number of employees as well as in economic terms. Today the company has over 300 employees and reached NOK 460 million in sales in 2020. During the recent years the company has gone through several changes. This has changed the dynamics of the company and how projects are run. As a result of the changed dynamic, Signicat wants to achieve a better balance between formalism, creativity and coordinated structure versus delegation of decisions. In addition, the company aims to better their project prioritization and get clearer decision making.

Per 2021 Signicat is working with the digital solution in Denmark, MitID, and the project is set to launch for end-users during mid-2021. This project is similar to another project Signicat has done in Finland, called FTN. Signicat has expressed a wish for a report about the methodology of the projects, as well as how experience learned from the FTN project can be applied in future projects, like MitID. This thesis will focus on the two projects and the agile framework in the company.

Furthermore, the employees in Signicat want to address the differences and similarities between FTN and MitID combined with mapping the formal structure of the company. How do they succeed in a project and what makes it successful?

In the specialization report, I concluded that FTN was not an agile project, but that the project was a start on an agile mindset in the company. How far has the development come when it comes to MitID and what does it take for the company to become completely agile?

Signicat uses agile methods in some projects, and my goal is to find out if MitID was characterized by such methods. Agile methods in projects are an effective way of working when you do not know the scope and content of the task in depth. These methods can be used when you have to find the way of doing things as you go. Agile methods are therefore great to use when you are working on projects where the unpredictability is high.

The objective of this task is to get to know Signicat's agile approach towards projects and learn more about how this has affected the company's growth since 2007. It will also be interesting to see if this knowledge can be applied to future projects, and whether an agile approach will make it harder to plan ahead.

1.1 Research Questions

The purpose of this thesis is to create an overview of agile and traditional project methodologies and explain the principles involved. In addition, the thesis will examine how Signicat carries out projects and whether agile methods can improve project implementation in the company.

The research questions are intended to form the basis for the thesis and are designed in consultation with my supervisor at NTNU to ensure both relevance and scope. As a result of the chosen subject "Agile methods in Signicat", it has been decided to ask the following research questions:

- What are the similarities and differences between FTN and MitID?
- What are the characteristics of Signicat's agile approach?
- What can Signicat learn from MitID for future projects?

1.2 Structure

The remaining parts of the thesis are structured as followed. The method section deals with the methods used to retrieve information and find relevant literature. The section about Signicat deals with the company, including general information about Signicat and the two projects FTN and MitID. The theory part deals with central theory related to agile methods, as well as important concepts within agile methods. The analysis chapter will compare different agile methods and describe agile methods used in Signicat and in the two projects. The different agile methods are summarized in a table. The discussion section will discuss the theory that has been presented. In addition, this chapter will review the similarities between the projects. The thesis ends with a conclusion that summarizes the most important topics of the thesis and answers the research questions.

2. Method

This chapter deals with the methods used in the research. Reflections related to why the given methods has been chosen will be presented, as well as a discussion tied to whether the methods are suitable for answering the defined research questions. In addition, this chapter reflects on research ethics considerations, and how the chosen methods may affect the quality of the thesis.

2.1 Research Design

Mainly qualitative methods have been used in the research process with a case study for answering the defined research questions. The following methods have been implemented:

- Literature search
- The collection of field data from the company such as:
  - Nine semi-structured in-depth interviews
  - Company visits and meetings
  - Continuous dialogue with the employees

To explain more in depth regarding the research design, Saunders' research onion has been used (Saunders, 2019). The onion's layers illustrate the stages in the development of a research work and were developed by Saunders, Lewis and Thornhill (2007). This method is adaptable and can be used in a number of contexts. Seen from the outside, one can imagine an onion where one has to take off the outer layer to get to the inner layer, and each layer of the onion is a more detailed study of the research process. This can be seen in parallel with research where each task must be solved step by step to get to the next.
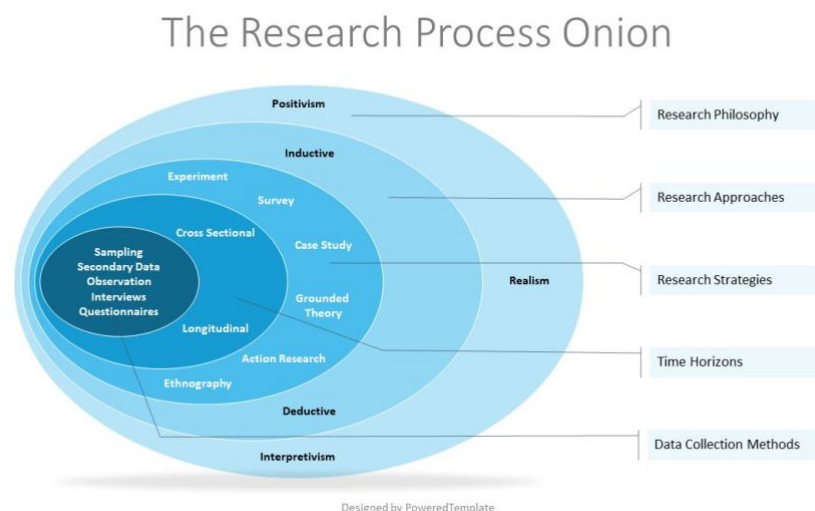

Figure 1: The Research Onion (Saunders, 2019)

As seen in Figure 1, the outermost layer of the research onion represents the research philosophy. This sets the stage for the research process and defines the method used in the second step, the research method. In the third step, the research strategy is decided, and in the fourth layer, the time horizon for the thesis is identified. The fifth step is the stage where the data collection method is presented.

2.1.1   The Research Philosophy

The outermost layer on the onion, the research philosophy, relates to the reality of what is researched and how to interpret this reality (Saunders, 2019). This is defined by the type of knowledge that is studied in the research project.

Among the three various philosophies are ontology, epistemology and axiology (Saunders, 2019). Ontology deals with the study of reality, which can be divided into objectivism, constructivism and pragmatism. The first two are about the social point of view of knowledge and that different people have different perceptions, while the last is about using theory to identify solutions to a problem.

Epistemology is used in scientific research to find evidence that can be proven without a doubt, which includes positivism, realism and interpretivism (Bryman, 2012). Positivism is a philosophy based on the use of research questions that can be tested. Furthermore, it deals with general knowledge where theories should be able to be explained. Realism allows for new research methods such as the need to conduct research in order to know the reality. Realism and positivism have similarities, but the fact that positivism supports scientific methods, which realism does not, separates them. Interpretivism is about interpreting how different people view their own actions and others' own. This philosophy will help understand different cultures and the participation of different people in social life. Axiology is about values and opinions that influence the collection and analysis of research (Saunders, 2019). The philosophy of a research simply provides the justification for the research methodology.

Agile methods can be seen in the context of both the ontology, the study of reality, and epistemology as realism. The agile methods are primarily created by humans and the social point of view has played a role in the development of this knowledge. Different people with different opinions of projects have worked together to develop these methods. This is further described in the theory chapter in section, 4.2.1, which amongst other things focuses on the

agile manifesto, the "cornerstone of agile methods". Human and social aspects can therefore be tied to the theory. New research methods have been used to better understand reality. Thus, realism is relevant for the thesis. Agile methods are a new way of working and thinking. These methods often use "trial and error" to try different approaches, before the work is assessed and adapted accordingly. This retrospective way of thinking and doing is a crucial part of the process in agile methods.

2.1.2   The Research Approaches

The second layer of the research onion includes inductive and deductive approaches (Saunders, 2019). The inductive approach focuses on going from empirical to theoretical information. This can be explained as new knowledge in areas with little or no prior knowledge. The deductive approach is about going from the theory to the empirical and back again (Jacobsen, 2015). This approach is a testing methodology which focuses on confirming or rejecting assumptions where there is a lot of prior knowledge.

This study can be done with both approaches, either an inductive or a deductive approach. From an inductive point of view, a researcher collects data with an open mind from empirical data to theoretical data. With a special angle towards Signicat with a focus on the empirical data, one can connect experiences from projects done in the company to theory about agile methods. Signicat's approach to agile methods is mainly based on experiences from previous agile projects and with less focus on a literary approach

The deductive approach, where the researcher draws logical conclusions from theory to empiricism, fits best for this thesis. Information and literature about agile methods available will be compared and connected to findings from the interviews. This is information on a more general basis that can be related to any company or project. This can be connected to Signicat and their experiences from the work done in previous projects to evaluate if agile methods have been used.

2.1.3   The Research Strategies

According to Saunders et al. (2007) the research strategy is about how the researcher should carry out the work. The strategy can include various approaches such as case studies, interviews, questionnaires or surveys, as well as experimental research and document analysis.

In this thesis the main focus is on a case study. This strategy focuses either on one or more people, or a single area (Saunders, 2019). The thesis focuses on a specific area in Signicat; agile methodology in their project work. This form of research is very effective when comparing two or more experiences in a company, which is exactly what is done in the company in question. In addition to the case study, nine interviews were conducted to obtain enough empirical information and experiences from Signicat internally.

The specialization report from autumn of 2020 focused mainly on the project about FTN. The master thesis will continue the work started and will compare the FTN project with the MitID project.

2.1.4   The Research Choice

The fourth layer in the research onion is related to research choices. This revolves around the use of qualitative and quantitative research methods, and whether one is combining the methods or only using one of them. There are three different opportunities in the research choice; mono, mixed and multi (Saunders et al., 2007).

Mono is self-explanatory as it relates to using only one of the methods, either a qualitative or a quantitative methodology (Saunders, 2019). With mono, a combination of the two is not possible. A mixed method allows for combining the two methods to create the most accurate data set possible. The multi method is the last of the three research choices. This method is similar to the mixed method as both the qualitative and quantitative method is combined in one study. The difference between them is that the mixed method combines the methods for establishing one specific data set, whereas the multi method is used where research is divided into segments where each segment needs a specific data set.

Distinguishing between quantitative and qualitative methods for collecting information can be demanding. This thesis is based on the qualitative approach. Therefore, the method that has been used is most similar to the mono method. This is explained in detail in Chapter 2.6.

2.1.5   The Data Collection Method

The last and deepest layer of the research onion concerns the analysis of the data, as well as data collection method used (Saunders et al., 2007). This stage contributes to answering the

study's overall reliability and validity. This is further explained in Chapter 2.7, which explains how collected data is analyzed and used in the research (Bryman, 2012).

2.2 Literature Searches

Systematic literature searches are useful for finding the right and relevant information (Johannessen, Tufte and Christoffersen, 2016). The results from the literature search can be used as a basis for further research and will be an important factor in the creating and understanding of one's own result.

From the beginning of this study in the specialization report, the focus was on reading literature and previous studies on different agile and traditional project methods. With a thorough literature search, it can be ruled out if there is a lack of data and information about the subject one wants to study. This is an important part of the start-up process in such a study. Although the literature search has been an essential part of the whole process, the focus was greatest from the start.

Different search engines have been used during the process, including Oria and google scholar, as well as various databases at NTNU. In the search for relevant literature the following keywords has been used:

- Agile methods
- Agile methods in project management
- Flexibility and agile methods
- Traditional project management
- Project management, from traditional to agile
- Agile methods today
- Agile project management, Scrum
- Agile project management, Kanban
- Scaled Agile Framework

As the literature searches began to increase, a new method of using the reference lists of the literature was found along the way. The reference lists in the research already conducted was used to find new and relevant research articles. The method is called "the snowball method", where one source is passed on to another through references. This can in fact be seen as an agile

approach to researching and the search for literature on a thesis about agile methods. By conducting the collection of research in such a way, every article and other information has been considered and it has been assessed whether the given information is relevant for the thesis. Next, the focus was on evaluating if the information collected was good enough, and if there were other sources that confirmed what previous sources said to get the information confirmed through several sources.

The literature was mainly considered relevant if it was published after the year of 2000, preferably even newer. This may seem confusing as the agile manifesto of Cohen (2004) is widely used in this thesis. The agile manifesto is still considered relevant even though it was written almost 20 years ago. Traditional project methods have been used for a long time, but agile project methods are quite new, therefore research conducted for more than 20 years ago will probably be less relevant. The literature search has been done with a critical view, combined with a systematic selection of keywords to avoid less relevant sources. Several different sources and references yielded the same results, which indicated that the selected sources were of good relevance.

2.3 The Document Analysis

Olsson (2011) recommends document review as an activity in the preparation phase of a case study. For this reason, the analysis started early. Such an activity is useful to provide an overview of both internal and external issues related to the topic. Document analysis is often used as secondary data to substantiate other findings (Tjora, 2017). Examples of such document analysis are standards, legislation and internal and external research documents. Document analysis often contributes to an increased understanding of the data collected and is seen as valuable. However, a weakness of document analysis is that a quality control of the documents is not always possible, especially for topics where the literature is limited.

For this study, internal documents that were reviewed in this phase were documents in Signicat that dealt with guidelines for the project processes, general information about the company and a presentation of their growth during the recent years. In addition, access to an internal database was provided. Signicat uses the online workspace "Confluence" to compile internal documents and procedures. Furthermore, ambitions for how the agile topics were to be followed up in a project were reviewed.

External documents included legislation and certification documents on digital identity in both Norway, Finland and Denmark. Many new words, terms and expressions that are a central part of the everyday speech in Signicat had to be learned. The same goes for guidelines for how Signicat is certified as broker, and what requirements Finland and Denmark set for such a role.

2.4 Other Data Collection

A number of different activities were carried out to obtain data and information for this thesis. This included nine semi-structured in-depth interviews, several project visits and meetings with employees in Signicat, a digital meeting with Torgeir Dingsøyr from Sintef, an expert on agile methods in larger teams, as well as listening to a podcast about digital identity with the product manager in Signicat, Jon Ølnes.

2.5 The Interview Process

The first interview was conducted 13th of October 2020 with Jon Ølnes, product manager in Signicat. The other eight interviews were conducted in February and March 2021 with the following interviewees:

- Kristine Buan, project manager for MitID
- Arild Haugen, project manager and expert on agile methods
- Lars Møller Kristensen, product manager for MitID
- Roger Klausen, project owner for MitID
- Florent Legendre, software manager
- Kåre Indrøy, product owner for e-ID and MitID
- Dorthe Linddal Rasmussen, marketing responsible
- Thorbjørn Sundbøe, poject manager for Tech Excellence

Through the entire process, there has been a continuous dialogue with the employees in Signicat. The method used in this thesis was a qualitative interview method. The interviews have been the most valuable resource in the research. The purpose of such a research method is to find out what experiences the interviewees have from previous agile projects in the company and to tie this information together with relevant theory. The relevant questions were sent to the interviewees by e-mail prior to the interviews. By doing so, the interviewees got a better understanding of what the interviews were going to be about and point out the key

themes. This made it possible for the interviewees to be able to prepare for the interviews. The interviews were conducted more like natural conversation than a strict and structured interview, as the interviewees talked about their own experiences and angled this towards the questions asked. Such interviews are characterized by a higher level of flexibility and less structure.

The interviews were recorded and later transcribed and deleted. Due to the COVID-19 situation, some of the interviews were conducted digitally via Zoom with screen recordings, which was agreed in advance with the interviewee. Others were conducted at the office, with voice recordings for the transcript. 60 minutes were set aside for each interview, which was enough time.

Prior to the first interview, an interview guide was produced and sent to the supervisor at the University for input before being submitted to NSD (Norsk Senter for Forskningsdata) for approval. This was to ensure that the interview is compliant with rules on privacy and GDPR (General Data Protection Regulation). The transcribed interviews and interview guide are attached in the Appendices 9.1 and 9.2. The interviewees did not express a need to be anonymous and are therefore mentioned with full name and title.

The information and amount of knowledge gained from the interviews, as well as the information gathered in the literature study, are considered sufficient to answer this thesis.

2.6 Data Analysis

Section 2.1.4 about the Research Choice introduces the qualitative and quantitative data analysis. This will be discussed more in the following section.

A qualitative analysis should give the reader increased knowledge of current topics, without the reader having to review the collected data (Tjora, 2017). Jacobsen (2015) emphasizes that the goal of such a data analysis is to concretize each individual piece of collected material in order to be able to compare the components. The main emphasis of this thesis is on the qualitative approach, especially when it comes to the information about Signicat and how they work in agile projects. The information has been gathered by asking employees in the company about agile methods and projects, both during shorter office visits and longer interviews. In addition, a literature study has been done. The literature study involves literature related to traditional

project management, as well as more modern project management with the development of agile methods.

Holme and Solvang (1996) divide the qualitative data analysis into three parts: facilitation of data, content analysis, and dissemination of data. For the interviews, data can be facilitated by transcribing audio and video recordings and taking notes from the interview situation. This was the approach chosen for the semi-structured in-depth interviews. The transcripts were completed as soon as possible after the interviews, as recommended by Dalen (2004). The recordings were deleted for privacy reasons as soon as the interviews were transcribed. After the interviews it was planned that any follow-up questions would be sent by e-mail in the event of any uncertainties of other questions that might occur. However, as there were no uncertainties, this was not necessary for any of the interviews. Facilitation of data from the document analysis is mainly about source criticism (Holme and Solvang, 1996). This was practiced using criteria for credibility, objectivity, accuracy and suitability, in the same way as in the literature study.

As there are multiple sources of literature related to agile methods, there was never a shortage of information available on the topic. For extensive reasons it was necessary to limit the data included. The focus was primarily on how information could contribute to answering the research questions and find the most relevant literature. The literature used in this thesis has been obtained both during the autumn of 2020 and the spring of 2021.

For the content analysis itself, Jacobsen (2015) recommends an intuitive categorization of collected data. It was considered appropriate to focus on the research questions defined. This was done in order to be able to compare data obtained from different informants, through different methods. Initial division consisted of the priority methods within project management, both traditional and agile methodology. The agile methodology was concretized mostly with a focus on Scrum, Kanban, and Scaled Agile Framework. As concrete findings were uncovered through the work, collected data were categorized according to these. The categorization helped to put into perspective the statements of each individual informant, where the findings were compared and set up against each other.

The task could have been solved in a more quantitative way where research is based on numbers and hard data. According to Olsson (2011), quantitative studies have a higher degree of

verifiability. Finding figures and information from various companies that have worked agile for a given period is one example of how the task could have been solved in a more quantitative method. The angle chosen in this thesis is more about how Signicat carries out their projects and agile methods in general. Based on this, it has been chosen to focus on the qualitative approach in order to understand the methodology in a more human-oriented way. Signicat wants to use this thesis for their own future projects. The thesis will therefore be more helpful as a study angled directly towards them as a company, rather than pure data that later would have to be analyzed in light of their focus areas.

2.7 Assessment of Research Design

Validity and reliability are among the indicators that can be used to ensure the quality of a task (Tjora, 2017). These indicators are crucial for a task to appear credible and relevant. Chapter 2.1.5 introduces such indicators, which are tied to the deepest layer of the research onion (Saunders et al., 2007). This section will explain them in more detail.

2.7.1 Validity

Validity is a measure of whether a survey measures what it is supposed to measure. Hence, it is important to obtain data from various sources to ensure high validity in a thesis (Yin, 2014). Validity can be divided into two different types: internal and external. The internal part relates to whether the results are valid and representative for both the sample and the problem that has been investigated. The external part describes the extent to which the results can be transferred to other situations or not.

In this thesis, the internal validity is based on theory, explanations and explanatory models from different perspectives. The literature is therefore selected on the basis of how to look at flexible and agile methods from different perspectives and situations. This includes opinions from different employees in Signicat and their thoughts on the use of agile methods in their project work. An interview was conducted with an employee in Signicat who has nothing to do with the projects, but who is an expert in agile methods (Appendix 9.1.3). This interview has been used to ensure the quality of methods and link relevant methods to the company and the projects.

Validity can be tested if you have been unlucky with anything during the process. Examples of this are if the interviewees have not spoken honestly or not told the whole and entire truth, or if the interviewees work in departments that are not seen as representative for the given topic. Other factors that can weaken internal validity in a study are lack of common understanding of concepts, which in an interview situation can lead to misunderstandings, or that the interviewer and informant talk past each other. To prevent this, an effort was made during the data collection to explain and understand all used terminology. In the in-depth interviews, this was done with follow-up questions to ensure consistency through the entire interview. Despite these examples, the conducted interviews went well, and the thesis aims to give a realistic picture of the company and how they have carried out their agile projects. With nine interviewees from different departments and disciplines in Signicat, it is realistic to assume that this thesis has a representative view of the reality in the company and that one can interpret the information as correct and relevant. Conducting only one interview may result in only getting one view on a case with several different views.

Until 2018, Signicat has been a relatively small company where most of the employees continuously have been aware of what others are doing and what is going on in the different departments. Today, there are more than 300 employees in the company and the roles have become more concrete and defined. By listening to what different employees in the company have to say about agile methods, which resulted in quite different answers, several assumptions have been both confirmed and denied. Nevertheless, further work will be needed to uncover more nuances, confirm or deny more assumptions, and to further investigate and examine the findings presented in this thesis.

The external validity concerns whether the findings in a study can be generalized. In this thesis, external validity is a significant shortcoming. On one hand, the generalizability of Signicat is not the best as the company is quite new and medium-sized. One can interpret the answers received from Signicat as relevant and transferable to other companies. According to The McKinsey Podcast (2020), most small and medium-sized businesses succeed with agile methods, as larger companies have too many employees and too much that needs to be changed to achieve it. In this thesis it is assumed that Signicat's views on agile methods may be representative for other companies as well. This especially applies to the transition from traditional methods to agile methods, as well as the fact that the methods can be used in different situations and departments, not just in software development. This is also justified by the fact

that several of the employees in Signicat, including some of the interviewees, have recently worked in other companies where they confirm the same challenges and benefits of such methods based on their own experiences. The involvement of employees from different departments and disciplines in the value chain can also help strengthen external validity. Even though this can contribute to generalizability, it is not a guarantee of generalizability.

2.7.2 Reliability

Reliability shows the extent to which a data collection can be verified or not. In other words, if one gets the same result if the exact same survey is carried out again (Dale, 2008; Yin, 2014). The requirements for reliability can be demanding to satisfy, especially in qualitative studies (Tjora, 2017)

Reliability can be divided into internal and external reliability (Dalen, 2008). The internal part concerns if other researchers can use the conceptual apparatus for the analysis of data in the exact same way as the original researcher. The external reliability concerns whether different researchers discover the same phenomenon and generate the same concepts in similar situations.

In this thesis, one can assess the internal reliability based on whether the same interviewees will again confirm what they previously said and have the same opinion, or whether different interviewees in the same company confirm each other's assertions. External reliability will be difficult to get tested and proven directly in this thesis. However, after the thesis is completed one example can be to test if one gets the same results in a similar company who has the same experience with agile methods.

In an interview situation, confusion and different interpretations of the questions can quickly arise, which can be a problem for reliability. Especially when conducting a semi-structured interview, you can easily derail and start talking about something completely irrelevant because the interview becomes more like a conversation. It can therefore be difficult to ensure that all requirements for reliability are met in qualitative studies, such as this one. Qualitative methods can thus lead to a certain degree of subjectivity, which will require the researcher's awareness in the analysis (Tjora, 2017). If several methods give the same result, the study can be said to have high internal reliability. Based on the fact that a total of nine interviews have been

conducted in this thesis, it is realistic to assume that this problem can be neglected on the basis that much of the information from the interviews is confirmed by the other interviews.

In an attempt to minimize the risk factors for the interview to derail, an interview guide was prepared and sent to the interviewees in advance of the interviews. This meant that all parts in each interview were aware of the interview's purpose and what the desired outcome was. In addition to the interviews, there has been a continuous dialogue throughout the process with two employees in Signicat to clarify any ambiguities immediately. As mentioned in section 2.6, video or voice recordings were also made of the interviews itself, which meant that one could rewind any misunderstandings and easily correct them.

External reliability will be difficult to assert in a thesis that only deals with one case company. One way to test the reliability may be to conduct surveys for IT companies across Europe to find out if the results and findings made in this thesis are general or only applies to the company in question. Another way to test the external reliability can be to find research articles about other companies that want to use agile methods and look at the results and whether this works for them. Conducting the same interviews that have been done in this thesis with other companies will also be an opportunity to test the external reliability.

The first research question which deals with similarities and differences between the two projects in Signicat, one can after analysis of the findings made in the thesis related to the FTN project assume that this is an abnormal development towards agile methods. The empirical data shows that the development towards agile methods took place more naturally and organically than usual. The findings from the MitID project are probably more *common* as the company actively introduces an agile practice.

In research question two which deals with Signicat's approach to agile methods, it has been confirmed by several of the interviewees who have experience from large Norwegian companies that they recognize the issues Signicat is struggling with, and which are the basis for this master's thesis. Comparing the two projects FTN and MitID is used as a basis in this thesis and such a comparison of two internal project can be assumed to be used in other companies or countries. Although the basis for the problem is the same, the positive outcome is probably specific to Signicat, especially after the FTN project. When it comes to MitID, Signicat had such good experience from FTN that the company made a conscious choice to try to be agile. I

think if one had tested similar project to MitID on similar companies in the same situation, one would achieve some of the same outcome, this is justified by the fact that they made a conscious choice to take a more agile direction in the work.

In research question three about what Signicat can learn from MitID for future projects, this will be a natural advantage after a project for many companies. Lessons learned, both positive and negative, will be useful learnings and experience to bring into future project.

The internal reliability can be considered as high as nine interviews were conducted with employees from different departments in the company, in addition to the interview guide that was sent to all the interviewees prior to the interviews. External reliability will be difficult to test in a thesis like this, and the research questions contain both high and low external reliability as some findings from the empirical data seem abnormal, while other findings are more common. The two first research questions deal with Signicat in more detail, which can be difficult to relate to other companies. Nevertheless, the findings from MitID are a more normal situation in agile projects that can be found relevant for other companies. Findings from the last research question is assumed to have high external reliability due to the fact that this is about comparing two internal projects that most companies can relate to.

3. Signicat

This thesis is a study of agile methods in projects in the IT-company, Signicat. The company operates in a business area characterized by forward-looking technology (Ølnes and Seres, 2020). This section will focus on the case company, Signicat, and especially the FTN project and MitID project. The sources used to obtain relevant information for this chapter are from a podcast with Ølnes and Seres (2020), Signicat's website, interviews with the product manager in Signicat, Jon Ølnes (Appendix 9.1.1), project manager in MitID, Kristine Buan (Appendix 9.1.2), project manager and expert on agile methods, Arild Haugen (Appendix 9.1.3), CPO and product manager in Denmark, Lars Møller Kristensen (Appendix 9.1.4), CPO and project owner for MitID, Roger Klausen (Appendix 9.1.5), senior software developer, Florent Legendre (Appendix 9.1.6), product owner for e-ID and MitID, Kåre Indrøy (Appendix 9.1.7), marketing responsible for MitID, Dorthe Linddal Rasmussen (Appendix 9.1.8), the project manager for Tech Excellence, Thorbjørn Sundbøe (Appendix 9.1.9), and notes from company visits, as well as e-mails and conversations with employees in Signicat.

3.1 Signicat in general

Signicat is a trusted digital identity company and one of the leading providers of electronic identity and signature solutions in Europe (Ølnes and Seres, 2020). As the product manager in Signicat, Jon Ølnes, describes, your identity is the sum of all information about you. Every human on earth is unique and has their own characteristics that belong only to themselves. Signicat's security solutions are used at all financial levels, from government and big banks to small business – and everywhere in between. They continue to be leaders in innovative security solutions, reducing risk while providing a smart and intuitive user experience. Signicat has earned the trust of institutions and businesses by providing user authentication, electronic signing, identity proofing and document preservation. Signicat's main services are shown in Figure 2.

Identity Verification
Securely identify users across borders with public eIDs, registry lookups, and identity papers

Authentication
Easily integrate with public eIDs from all over Europe, social media, and other multi-factor solutions

Electronic Signing
Create legally binding electronic signatures and seals on documents for individuals and businesses.
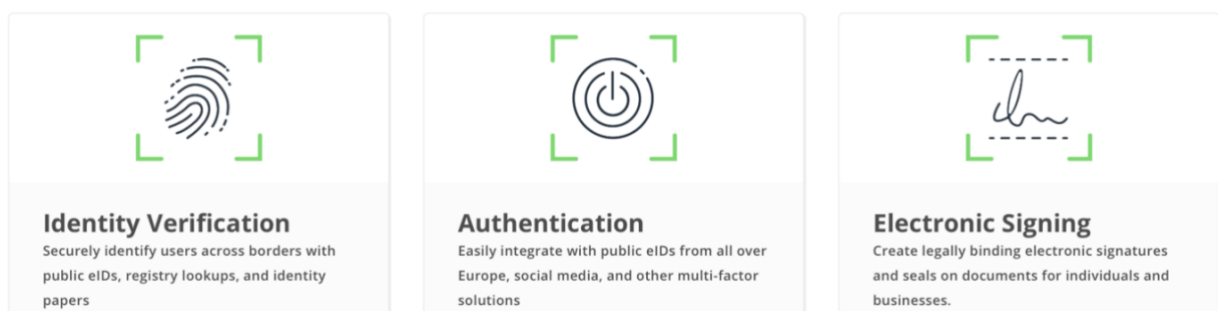
Figure 2: Signicat's services (Signicat, 2020)

Signicat uses bankID for various purposes. The average Norwegian has probably never seen Signicat even though they have actually used their services many times. For example, for bank Norwegian, Signicat delivers the login page, but end-users can only see the bank Norwegian page even though Signicat produces the service. The same can be said about the bank's app, where Signicat delivers the app solution. Signicat delivers the identity-authentication that is necessary for logging in. However, the end-user can only see bank Norwegian's app. This is a strategic choice by Signicat. They deliver software as a service to the customer, without focus on the actual brand of Signicat as the service delivered becomes an integrated part of the customer's solution (Ølnes and Seres, 2020).

Signicat is a business to business to consumer company (B2B2C), which means that they sell software to companies that sell to customers. Solutions and software are sold to various companies throughout Europe. Signicat works actively with European clean-up work in digital identity. However, the identity solution is very different between the countries. In Norway, you must have a bankID, which is the highest level of security. In Sweden, it is enough to have Swedish bankID. This is a level down in terms of security, but still safe. Signicat has encountered problems related to this, as Norwegian companies may want customers from Sweden, but as these customers only have Swedish bankID, they are out of reach. Hence, different countries prioritize their national solutions and products differently.

Signicat has a unique position in the market for digital identity and has had a yearly organic growth of 40% since the beginning in 2007 (Ølnes and Seres, 2020). Per 2021 there is four other competitors in the Danish market, and Signicat are interested in exploring their own expertise and figuring out how this expertise can be used in the best possible way. They are wondering whether the right choice is to become a so-called broker, which is an intermediary between the provider and the customer in this market. Given such a broker role, Signicat wonders how they can maximize their profit. Figure 3 describes how Signicat operates with such a broker-role.
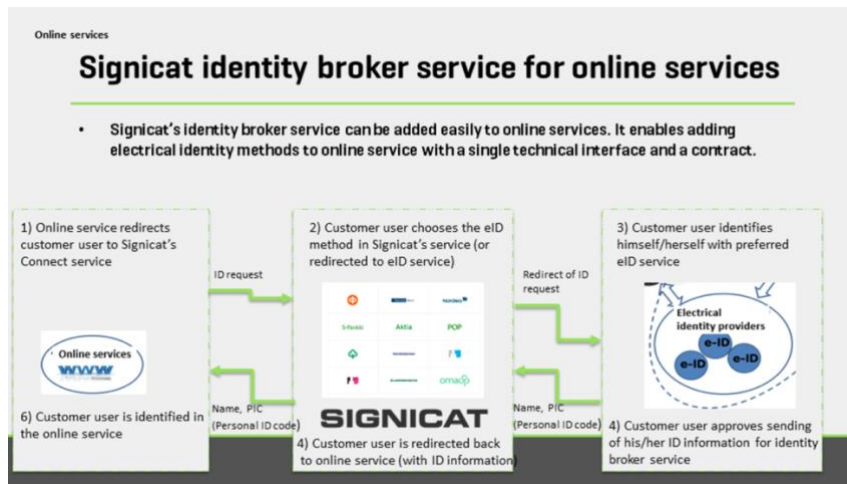
Figure 3: Signicat as a broker (FTN, 2017).

Signicat is working on a huge, new project called MitID in Denmark per May 2021. This is a similar project to the FTN project Signicat did in Finland, and they hope to use some of the experience learned during the FTN project to the work with MitID and other future projects.

3.2 FTN

FTN, Finish Trusted Network, is the Finnish regulatory regime for e-ID (electronic identity). Finland has a different regulation than all other countries (Appendix 9.1.1, question 4). They were very early with digital identity and is the only Nordic country that has a law on electronic identity. Denmark is in the process of something similar, with MitID, that will have more features as shown in Figure 4. Four years ago, Finland revised the law and aligned the national regulations with e-IDAS (electronic IDentification, Authentication and trust Service) regulations from the EU. New requirements ended up with a new architecture for how e-ID is set up in Finland, which became FTN.

Figure 4: New Features with MitID (Hansen, Ølnes and Kristensen, 2020)

There were several reasons why Finland needed the change. The starting point was that Finnish banks had a technical protocol for integration, called "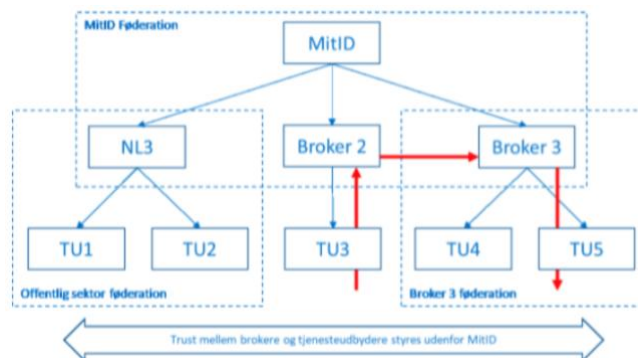TUPAS". This is an old method and a standard for how to integrate with the individual banks and their e-IDs (Appendix 9.1.1, question 4). In Finland they have ten different banks that have their own and different e-ID solutions. This separates them from Norway where the bankID can be used across the different banks. Finnish authorities wanted to make this easier and more customer friendly with FTN. By changing from the "TUPAS" protocol to standard protocols and change the system where all the players have one agreement with each of them, it would create a more user-friendly solution. With this solution it should be made mandatory to go through a broker, which is the role of Signicat in this project. This means that all the user sites get one integration point with the broker they have chosen. Through this integration point all e-IDs are included.

By creating such an integration point, the broker's role will also be regulated. When the e-IDs are required to contain security requirements, the brokers must include the same security requirements and the same system. This is to ensure that they have a common security throughout the entire chain, from e-ID to broker and through the user site. There is not a system like this in Norway, as we do not have such broker roles. Some of the requirements in this security system are that all the banks must go through a third-party certification, approval and full review of the given requirements (Appendix 9.1.1, question 4). The same applies to Signicat, which has to go through a third-party audit where someone goes through everything and approves that they meet the requirements. In addition to this, they will be under supervision of the Finnish supervisory authority, just as these e-ID issuers do.

Not everyone can become a broker. As mentioned above, there is a strict certification regime to become a broker. With a more structured system, where brokers are included, it will be easier to enter the market as a new e-ID service provider. If such a system would be successful, then a new e-ID service provider will only have to get approval from the supervisory authorities with auditing, and then they can operate and be available for the user sites.

The FTN solution is a more flexible model that provides more opportunities for innovation and new players in the market. It will probably be more complex for the end-users, with a menu of around ten options. Signicat also has technical standards they must comply with which includes

the security requirements from the Finnish framework, legal requirements, and the relationship with the third-party auditor. This ensures the correct implementation and approval on time.

For Signicat, the FTN project led to other benefits for the company. In addition to these technical requirements that were met and approved, there is a marked-based sales aspect as well. The company has had a huge improvement in sales in Finland with the project, with an increase of around 300%. The goal is to get the same results and impact with the MitID project in Denmark and continue to grow as a company (Appendix 9.1.1, question 4).

3.2.1   Project methodology in FTN

When Signicat started the process with the FTN project, they had less than 80 employees and was a rather small company. All the employees knew each other well and they did not operate with any particular kind of project methodology (Appendix 9.1.1, question 9). During the project they tested out various methods and tools, such as "aha", road mapping, and other ways of different thinking in their project methodology. However, none of the methods or tools worked out 100% for them (Appendix 9.1.1, question 9). Despite not being 100% successful, this testing made the employees aware that there was a need for more information and more basis for prioritizing tasks, especially at the product level. Together with these ideas, there was a trade-off with long-term planning, maintenance and troubleshooting. The employees slowly but surely understood that customer requirements coming in from the sidelines had to be prioritized and followed up, and they needed to find out if they had recourses enough to both satisfy the customers and to develop new products. Thus, the question that arose was how they could solve this in the best possible way.

Signicat has assessed how resources have been invested and allocated in previous projects. By assessing the use of resources, they have uncovered a waste of resources as the results ended up being not satisfactory. One can never be sure if something will be a success in advance or how good a product will sell. This made the base for the learning process that has led Signicat to move towards a method with better planning of smaller tasks.

The FTN project did not have any form of project methodology at all as the project was done quite ad-hoc. The employees in Signicat knew each other and each other's work areas well. Despite not having a clear distribution of responsibility and no defined tasks, it worked out as everyone took responsibility for everything. The employees gave themselves extra tasks if they

had the time and energy to do so. Everyone had a sense of community and felt an ownership for FTN. Thus, everyone wanted the project to go well. The project became a huge success and has resulted in large revenues for Signicat. However, seen in retrospect, the project could have been done with more structure.

3.3 MitID

MitID is a new electronic identity in Denmark, replacing the current solution, NemID (Signicat, 2021a). The new solution is a collaboration between the Danish public sector and the Danish banks and is the largest IT project in Denmark since NemID. MitID will be available in mid-2021 for danish citizens for their online banking, Digital Post, communication with public authorities, and to identify themselves in other digital services.

MitID is a replacement for NemID which has been the Danish bankID for more than ten years (Appendix 9.1.4, question 4). NemID was launched on 1st of July 2010 and is therefore outdated with old-fashioned technology and needs to be renewed. It is similar to the Norwegian bankID which came in 2004, although the Norwegian solution is still well-functioning, competitive, and more secure than the Danish NemID. There is therefore no need for a replacement in Norway yet (Appendix 9.1.2, question 4). Denmark has had NemID for many years and the EU's contract rules state that you cannot have public projects that last for more than 10 years before replacing them with newer projects. A new process is therefore necessary.

Three years ago, MitID started to be planned because the regulator, i.e., the authorities in Denmark, wanted to regulate the market for digital identity (Appendix 9.1.4, question 4; Appendix 9.1.2, question 4). Then there were other competitors who tried to get the role of MitID core developer and operate the core, where Signicat was one of them. Nets won the role and is thus the one who develops and operates the MitID core system now. Signicat is about to become what is called the MitID broker, similar to their role in the FTN project, which can be read about in section 3.2. The broker role means that there will be stricter requirements for those who will sell the service as the authorities consider this service to be so important to the citizens that it cannot be left to someone who has no requirements and guidelines for it (Appendix 9.1.2, question 4).

Compared to NemID, MitID offers the same functionality with additional features and ease of use, flexibility and safer authentication (Appendix 9.1.2, question 4; Signicat b, 2021). The main differences are both within the underlying technology and by improved user experience for the new Danish solution. MitID could possibly become the new standard for e-ID in Europe. This is often a case when a country replaces their solutions, before they realize that they want the most modern solution, and other countries follow.

Digital solutions have the ability to divide into different security levels. MitID has several security levels, so-called levels of assurance. The Norwegian bankID has the security level *level of assurance substantial*, which is the middle of three security levels. NemID has only one way of authentication, which is two-factor and the same level as Norwegian bankID *level of assurance substantial* (Signicat, 2021b). MitID can offer single factor support. The default level of assurance is substantial, but service providers can choose if the users must log in with *level of assurance high* or *substantial* depending on the required level of security. This means that the solution is customized and can offer different levels depending on the need.
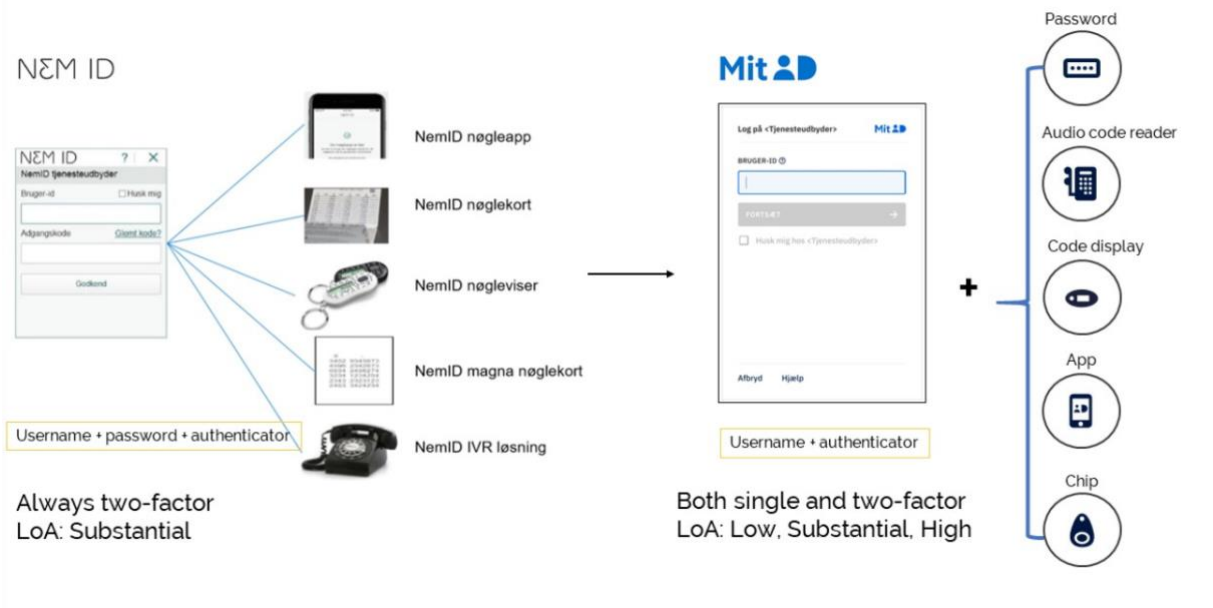
Figure 5: Differences between NemID and MitID (Signicat, 2021b)

The major change from NemID is that all services for identity verification must access the MitID infrastructure through a MitID certified broker, such as Signicat, as written earlier and as shown in Figure 5 (Signicat, 2021b). This means that you cannot access MitID directly as you could with NemID. The change in the process can be explained in the following way: for an insurance company that wants to log in with NemID, the insurance company can connect

directly to the NemID system, while this is not possible with MitID where you have to go through a broker (Appendix 9.1.4, question 4). When connecting to the MitID system, you must select one of four brokers. It is not possible to go directly to the bankID without a broker. MitID is thus just a new bankID type in Denmark with a more innovative system. Both of the projects are solutions for digital identity and how to log in and sign documents digitally.

On May 5th, 2021, Signicat got certified as a MitID broker. May 6th has been the date for deploying MitID to production for more than two years, and Signicat was ready from that date. The production will happen on May 20th, 2021, and it is important to clarify that the extension of two weeks is not due to Signicat's readiness but due to Nets' capacity for initializing to MitID. The project is the largest IT project in Denmark since NemID, perhaps the biggest ever, and being on time like Signicat on a project of this size is extraordinary.

3.3.1 Project methodology in MitID

The project process for MitID has been quite chaotic. Not only because of COVID-19 or that the team is divided between Norway and Denmark, but because of time, priorities, and communication (Appendix 9.1.2, question 8). The project group has tried to focus on the most important factors of each sprint, and work on the next version of delivery instead of end-goal. In the beginning, the project seemed large and distant, and it was difficult to understand what should be done. After a period of working on the project, the project group realized that it was necessary to communicate something to the market, so marketing campaigns were planned, made and completed.

The marketing department conducted a survey to find out what the service providers wanted and expected in advance of the project (Appendix 9.1.8, question 4). Signicat could therefore show that they knew what was in demand and how much of a serious and experienced broker they are who want to listen to the customers.

Due to the COVID-19 pandemic there has been several changes in marketing and how things have been done in the project work. For instance, as physical meetings have been difficult to conduct, digital webinars have taken place instead (Appendix 9.1.8, question 6). The marketing department has also created an e-guide the customers can download and get information about MitID. Thus, the external communication has worked very well. The same applies to internal communication, much thanks to Slack which has been used as the primary channel of

communication. In this way it has been easy to get new information and ongoing updates in the project for everyone, not only those who are closest to the project.

To get the customers interested in the new product there was a need for sales material early in the project (Appendix 9.1.2, question 8). This was therefore a delivery early in the process, before a new methodology was created for product development of new product opportunities. When a new product opportunity is created, it must be operated in one specific way in Signicat, with a collaboration between all disciplines. The model should be a tool to explain who owns and operates each phase, in addition to who will contribute from other disciplines, as shown in Figure 6. Unfortunately, the new model was not a success, most likely due to the organization not prioritizing it (Appendix 9.1.4, question 8). Support from the top management team (TMT) to use this tool will be crucial in getting all departments to prioritize it. In addition, the roles in the project have been replaced several times. Signicat has also changed CEO, CPO, and CFO during the project. Roles in place to ensure organizational development, such as in areas concerning agile methods, have therefore been replaced, which has created a bit of chaos.
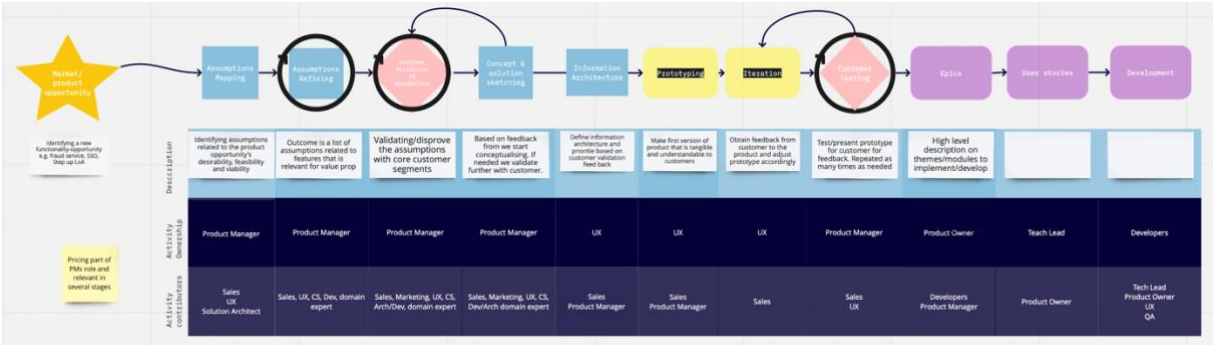
Figure 6: Project tool for the MitID process (Appendix 9.1.2)

An example of a challenge that has been repeated in the project is the gap between sales and development (Appendix 9.1.4). Sales did not establish customers they could validate against, nor did technology participate with resources and expertise (Appendix 9.1.2, question 8). To get an agile approach, one must think and work iteratively, which means to gradually deliver value to customers and stakeholders. It is difficult to get the sellers to agree with this as they never think iteratively. The sales department focus on selling or not selling (Appendix 9.1.6, question 5). The development department has been more interested in starting to code than participating in workshops about the product development process (Appendix 9.1.2, question 8). They want to work in two weeks sprints, be iterative, and take one task at a time (Appendix

9.1.6, question 5). Sales see no value in such sub-tasks and undefined products and believes that it is not good enough to be sold. The fact that they do not want to be part of the journey of establishing the small pieces, results in frustration for the development team. They find it demanding as "for them it does not make sense to talk about future things if they cannot take the simple things first" (Appendix 9.1.6, question 6). The problem is a lot about communication between the different disciplines and, as a leader, give time and resources to such a project.

The development team in the project has tried to be as agile as possible, and they have done all the ceremonies with a Scrum mindset (all the information about the Scrum ceremony is taken from Appendix 9.1.7). Until now, everything has been done in 2-week sprints, but there is a desire to change it to 3-week sprints to get more time in each sprint.

The Scrum ceremony in the project can be explained by starting with a backlog grooming, which takes places once per period, i.e., once per sprint. They go through a rough setup proposal for the backlog, discuss user stories and the tasks that are planned in the sprint, and possibly add new ones if the product manager, tech grid, or Scrum master wants to include more. It is an hour-long meeting where they work their way through the backlog and plan the process.

The next step in the process will be a review of what has been done in the last sprint. Each developer will comment on what has been completed and can run a demo presentation if desired. All the user stories in each epic will be reviewed. When this is done, they close the sprint. The tasks that have not been done yet will be moved to the next sprint. The product manager has already created a placeholder and a new sprint in advance, so it is ready for review when the planning starts.

Straight after the review, a retrospective is run on the latest backlog. Everything is reviewed and each developer provides feedback on what has worked and what should be changed. This takes between 1-1.5 hours and the Scrum master is responsible here.

The next step in the ceremony is sprint planning, where they go through the backlog and the tasks for the sprint where issues and tasks from the previous sprint are prioritized. They make an estimate at the story point level. The current team for MitID, the e-ID team, has a velocity of approximately 50-60 story points. When the backlog is stimulated, a priority is given if the number of story points are higher than the desired velocity to reach the preferred level. This is

done to try to complete all the tasks to clear the backlog. If a developer runs out of work, and cannot do other tasks in the sprint, he must check the backlog, or what is defined in the next sprint, but it rarely happens. Developers more often have too much to do than too little. In addition, they run daily stand-ups, where each individual is allowed to report status. Additionally, it is possible to arrange follow-up meetings if necessary.

Various methods have been tried out during the project, with a particular focus on Scrum and design thinking with "minimum viable product", "assumption mapping", and "assumption validation" to try to collaborate best with customers and get better market feedback (Appendix 9.1.4, question 7-8). The Scrum part has worked well for the developers with daily stand-up meetings, sprint reviews, and sprint planning. The problem areas are primarily tied to communication. The communication between the division for sale, for development, and for market has a major potential for improvement.

3.4 Agile methods in Signicat

Signicat now try to use agile methods increasingly and has a clearer vision of which project and tasks benefit from an agile approach and which does not (Appendix 9.1.1, question 11). For smaller tasks, it is often more beneficial to use agile methods than for larger tasks. In small projects and associated tasks, you can have a system where one can tick off when a task is done, and one can utilize the resources accordingly. The developers in Signicat prefer to work this way with agile methods. Larger tasks that should be prioritized over time and that may present a plan for the product, may be more difficult to perform in the given way.

The MitID project in Denmark is trying to be done in a more structured way than the FTN project and with a more defined project methodology. The majority of the resources have been allocated to different tasks and the employees involved in the project focuses solely on the MitID project and no other projects or tasks. Nevertheless, if the employees are in a final period of the project with fewer tasks, they can make themselves available for other tasks outside the project. Hence, the employees have not been completely shielded, but quite shielded to operate solely with the MitID project. This varies between roles and for the different phases of the project. MitID has been considered more structured and planned than FTN in retrospect, but not a completely agile project. The development team is one of the teams that has worked agile,

but Signicat struggles to get the market-oriented, such as the teams in product, sales and marketing, to work in the same agile way as the developers.

Most of the developers in Signicat want to use such agile methods (Appendix 9.1.6). Developers receive training and knowledge in agile methods during their studies, and it is becoming increasingly common for non-developers to learn these methods in school. The world is getting more complex and the need for digitalization is growing. Even if the agile method is the way of doing project, the more traditional approach will fit best for some projects. There must be a structured combination of agile and traditional project methods that work together in a hybrid organizational structure as Signicat (Appendix 9.1.3). A project does not have to be either completely agile or completely traditional, but a version that fits the company best. There will always be some parts of a team or a project that work differently from the others. It is very difficult to work 100 % agile as many projects have a given deadline or framework, which make the project structure traditional. The most important for a project to be successful will be to get the various teams to have good communication between them.

Signicat has a lot of smaller projects which can be done by using agile methods. Not all the projects are as big as the FTN and MitID projects, which helps them to split the tasks in smaller amounts and share them between the employees. Authentication, as shown in Figure 7, is one of Signicat's main tasks and can be performed with agile methods. The most common agile method used in Signicat is probably the Scrum method, which can be read about in section 4.2.2 in this thesis. They are also trying to implement a variant of Scaled Agile Framework where Kanban will be an important tool as well.
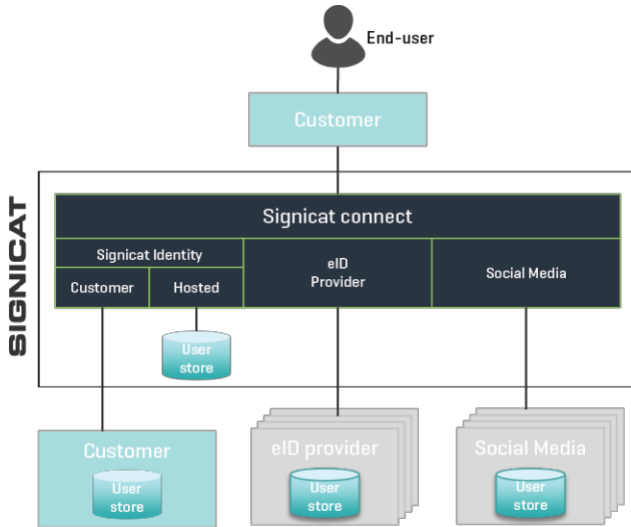

Figure 7: Authentication by Signicat (Signicat, 2017)

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During the autumn of 2020, Signicat did a project internally in the company, called Tech excellence. This project was an introduction and a structured approach to agile methods in the development teams. The project is divided into three phases where the first phase has been completed this autumn. The first phase was about becoming aware of what is expected in a sprint in addition to what one actually manages to do. Here, both Scrum and Kanban was used, and the development teams was closely followed up (Appendix 9.1.6). The goal for the project is to help the teams to plan better to create more predictability in the company. The desire was to affect the whole company, but so far only the development department has benefited from it. Signicat wants to get the whole company involved in this against a Scaled agile framework, as shown in Figure 8. This will be explained more in detail in Chapter 4.2.4 about Scaled Agile Framework.
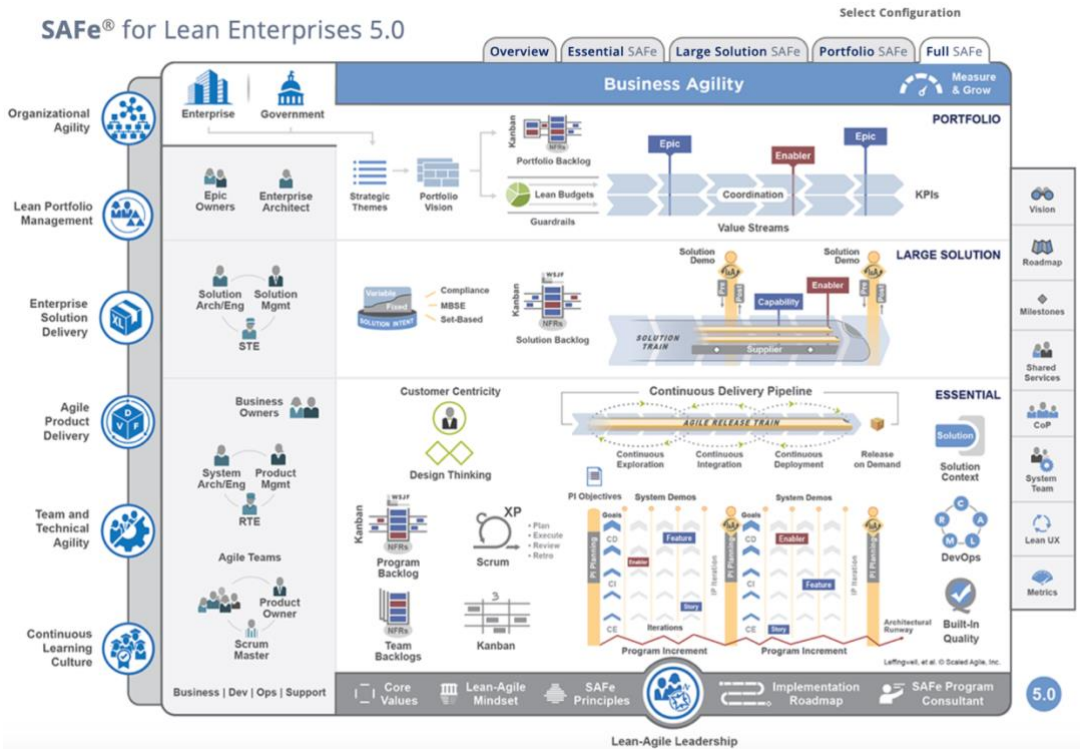
Figure 8: Scaled Agile Framework (SAFe, 2021)

With the scaled agile framework it is not enough that only the development teams work agile. Signicat is therefore focusing on how the entire company can work toward an agile project direction. How can the sales department and marketing department be connected to the developers? The different departments have the same goal; for the project to succeed. The path towards this, separates them (Appendix 9.1.2).

The employees in Signicat have some disagreement when it concerns which methodology to use, both in the various projects but also which model should be a template for the entire company (Appendix 9.1.4, question 7). This is due to the fact that training, knowledge, and interest in agile methods varies amongst the employees. The previous experience of the employees in Signicat is different, both when it comes to project work and experience from agile methods. Although opinions about agile methods are divided, everyone has a common opinion that everyone must agree on which method to use for the project to work optimally. It does not help that the developers work agile, while sales and marketing use more traditional methods if the desired goal is to have cross-functional teams where everyone work agile.

Aril Haugen, the senior project manager at Signicat from the interview in Appendix 9.1.3 has worked a lot with agile methodology during his career. When he started in Signicat, he interviewed a lot of people in the company about their work, if they had any frustration about the leadership, or what they meant could be improved in the company. The interviews showed that the agile approach in Signicat has only happened at the team level and not in the whole organization. The agile teams are placed in a traditional hierarchical organization with commercial ownership where the top management team (TMT) wants specific goals within given deadlines. Measurable goals are important to be able to measure success, but they require very concrete results and clear plans for how projects are implemented. Working in this way is not agile. It can be difficult to adapt the whole company through an agile mindset when the management wants to maximize the value of the company at all times. Changing the company towards this approach may be costly and take time. Both in terms of changing employees and their roles and mindset, but also that everyone must focus on internal change and growth instead of focusing on products and external growth.

Another employee in Signicat believes that agile methods have many advantages, such as developing the right product for the market at the right time (Appendix 9.1.4, question 11). Becoming completely agile is very dependent on the people involved in the project (Appendix 9.1.4, question 16). Personal commitment and motivation can determine whether the project becomes agile or not. If a team is working in a non-agile way, it requires more focus from management, processes, and policy, in the way of working, and how the whole team agrees on how things should be done. The Finnish team in Signicat is one example of a team that works agile and it will therefore be easier to do a completely agile project with such a team. The reason

why agile methods do not succeed completely in Signicat is because the marked department is not a part of the agile team. Without having this department completely integrated with the team, there will be an imbalance in the value chain.

The fact that Signicat has grown significantly in recent years has led to more structure in the company (Appendix 9.1.8, question 8). Things are done in a slightly different way than before when it was a bit more unplanned who performed the different tasks. The roles have become clearer in addition to the fact that the work is done more disciplined when structured as projects (Appendix 9.1.8, question 8).

In addition to more structure, steering, and clearer roles, the growth has also led to some employees having to relinquish responsibilities and power (Appendix 9.1.3). There has been a start-up mentality among the employees where many have taken too much responsibility (Appendix 9.1.6, question 13). A start-up requires more responsibility of each individual. The same person may be CTO, developer, tester, and responsible for customers. When a company grows, each role will require more responsibility and the roles will become full-time positions. Many people struggle to let go of the responsibilities they previously had and struggle with the changes. Nevertheless, such changes are crucial for a company to grow, some roles should be a bit contradictory, such as a product owner and a scrum master. The same person cannot have both of these roles, as they have to argue and discuss among themselves.

The senior project manager has, with his experience in agile methodology, made his own philosophy about agile project methodology with a trinity diagram, as seen in Figure 9 (Appendix 9.1.3). The diagram consists of project, agile, and design where each area has its characteristics. The project part focus on improvement of the project model and to establish the portfolio management. So far, Signicat has a basic methodology and no portfolio management prioritization. The second one, design, is about how to recruit and hire service designers and have a customer-driven development process. Signicat has interaction design in some teams, but no service design or design process. The last part of the trinity, the agile part, consists of scaled agile, one example of that can be read more about in the theory section 4.2.4 about SAFe. Another example of a scaled agile framework is the Spotify model. Other characteristics may be big room planning or objectives and key results (OKRs). In Signicat, there is a kind of agile team structure but not an agile leadership or a scaled agile model. The company has key performance indicators (KPIs) instead of OKRs and limited syncing.
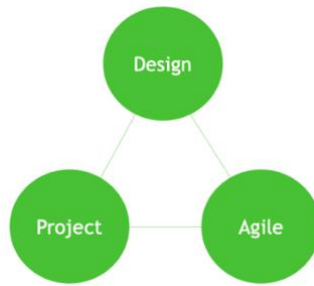
Figure 9: The trinity diagram (Appendix 9.1.3)

Signicat is a hybrid organization (Appendix 9.1.3). This means that the company has a combination between a traditional hierarchical structure and a completely agile structure. This creates challenges and friction, like shown in Figure 10 below. Such a structure often includes three different dimensions of challenges. First, it is about friction horizontally between the professional environments that are in the teams and those outside. Those who work agile in a project against those who are on the more traditional side. Examples of this will be sales and marketing against software developers.
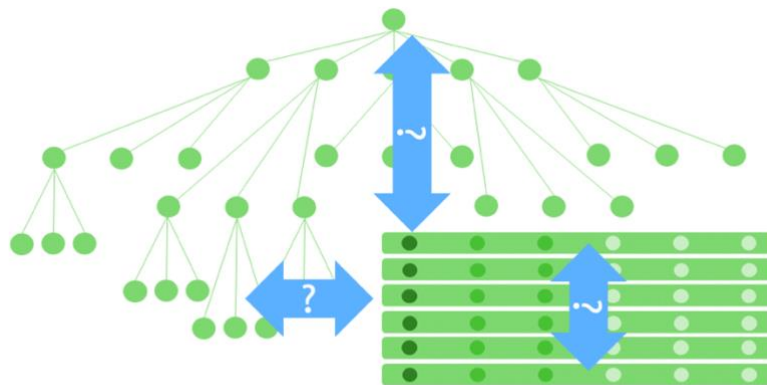
Figure 10: Three dimensions of challenges in a hybrid organizational structure (Appendix 9.1.3)

The second dimension is about synchronization between the teams. A project often consists of several teams that are dependent of each other. The internal communication between the teams will therefore be important to avoid dependencies that create delays. A proposal from the senior project manager is therefore to synchronize the operational dependencies with workshops to discuss and agree on the project schedules.

The last dimension is about reality orientation. It is therefore important with communication and collaboration between the top management team, the market oriented, and the developers

to conclude about what can be delivered or not. Examples of this may be if the wanted features are possible to create, but also if the cost of creating it is worth it.

3.5 Summary of Signicat

The leading provider of electronic identity, Signicat, has had huge growth in recent years. Such a growth involves internal challenges related to the organizational structure, but also regarding getting to know new employees. Finding a template for a common project methodology presents major communication challenges. Neither FTN nor MitID have been 100% agile projects, but some parts of the processes have been carried out as agile. As a result, Signicat is now working to find their best adapted methodology, whether it is agile, traditional, or maybe even a combination.

4. Theory

The theory chapter will focus on the project methodology, both traditional and agile. Relevant literature for the defined research questions will be explained and described:

- What are the similarities and differences between FTN and MitID?
- What are the characteristics of Signicat's agile approach?
- What can Signicat learn from MitID for future projects?

This section will give an introduction to both traditional and agile project methodology. The section about Signicat in Chapter 3 describes more about the company which will be discussed in Chapter 5 and 6. There will be a comparison and analysis of both traditional and agile methods later in this chapter. The agile part will also include a comparison of different agile methods. A more detailed description about the scaled agile framework will be given later in this chapter. The reason for choosing the three agile methods is based on which methods are used in Signicat and which methods they consider relevant.

Traditional project managers focus on upfront planning where factors like cost, scope, and time are given great importance. Agile project managers give prominence to teamwork, customer collaboration, customer success, and flexibility (Carr, 2017; Cobb, 2011).

4.1 Traditional project methodology

A project is a sequence of unique, complex, and connected activities that have one purpose or goal, which must be completed by a specific time, within a given budget, and according to the specification (Wysocki, 2011). Traditional project methodology was established in the middle of the 1900s. Normally, it follows a fixed sequence with initiation, planning, execution, monitoring and closure, and have a defined set of methods, techniques, procedures, rules, templates, and best practices used on a project (Kashyap, 2018; Spundak, 2014). Such a methodology should guarantee robustness and applicability to a wide range of projects, both simple and small as well as more complex and large projects. Sandra Matos (2013) writes about the first independent project management organization, which was the Project Management Institute (PMI), created in 1969. The purpose for the PMI was to share and discuss knowledge from earlier experiences in project management between the members of the institute. This resulted in a collection of experiences and recommended practices, as well as a book called the

Project Management Body of Knowledges (PMBOK) in 1987. The book is still considered as relevant literature as the sixth edition of this book was released in 2017.

In the book *Effective Project Management: Traditional, Agile, Extreme* there is a figure called *The Scope Triangle* as shown in Figure 11 (Wysocki, 2011). The area inside the triangle represents the scope and quality of the project. The lines on the outside representing time, cost and resource availability bound scope and quality. The time is the amount of time before the project must be completed. Cost is the budget available to complete the project. Resources are any consumables used on the project. For example, the amount of people that are available, the equipment available or the facilities (Wysocki, 2011). If a project is handled within these three constraints according to acceptable quality, the project is considered a success (Cobb, 2011).
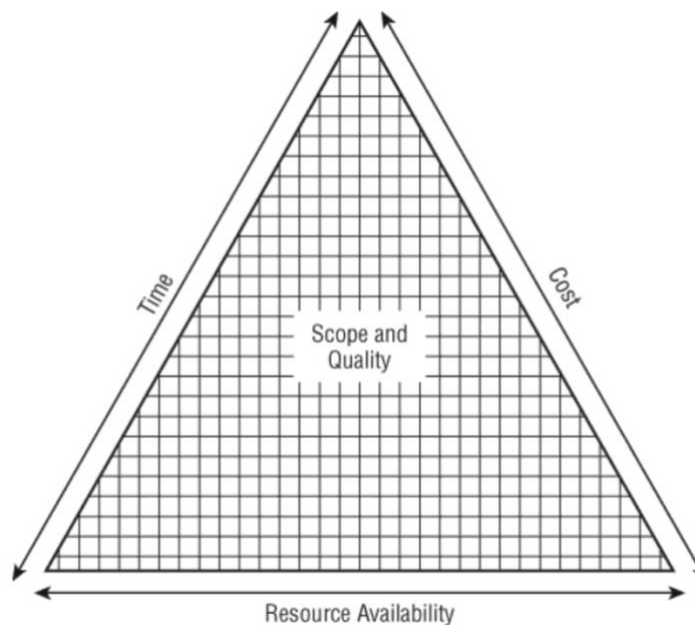
Figure 11: The Scope Triangle (Wysocki, 2011)

4.1.1 Characteristics of traditional project management

The typical characteristic of traditional project management is that projects are relatively simple, linear and predictable where all the phases of a process occur in sequence (Carr, 2017; Spundak, 2014). This makes it easier to plan in detail and follow the plan with few to no changes, as every project follows the same life cycle. The ultimate goal is optimization and productivity by following the first detailed project plan, as well as completing the project within the planned time, budget, and scope (Spundak, 2014).

The traditional project management approach emphasizes robustness as one of the advantages and prescribes that the same techniques and methods can be applied in all projects consistently. However, the literature claims it cannot (Carr, 2017; Lea, 2018; Spundak, 2014). One of the most central disadvantages of such an approach is that "one size does not fit all" (Spundak, 2014; Lea, 2018). With traditional project methodology, the entire project is planned upfront without any scope for changing requirements (Carr, 2017). The main reasons of inappropriateness of the traditional project management approach to the majority of today's projects are structural complexity, uncertainty in goal definition and project time constraints (William, 2005). A general model of traditional project management is illustrated in Figure 12.

Figure 12: The Linear Project Management Life Cycle Model (Wysocki, 2011)

An interesting view of this figure is that there is no back-loop to repeat any process group based on learning from a different group. This is probably one of the major weaknesses of such a linear project management life cycle model, as knowledge learned from one of the process groups cannot be used to change and improve the deliverables from a previously completed process group. The linear project management life cycle model is change intolerant and is therefore probably not the best model to use. A better life cycle model for the project management is shown in the following Figure 13. The incremental project management life cycle model is different from the linear model as the deliverables are now released according to a schedule
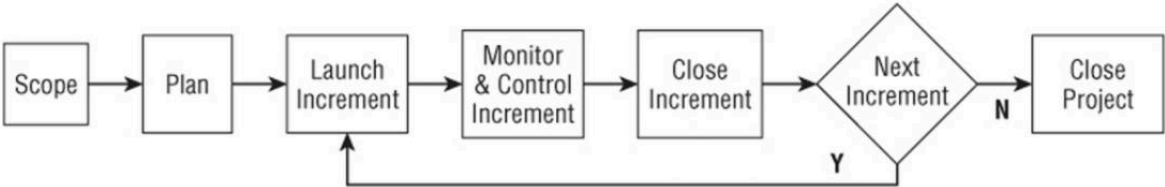

Figure 13: Incremental Project Management Life Cycle Model (Wysocki, 2011)

4.2 Agile Project Methodology

Agile methodology was created as a result of a reaction to the traditional system development methods. These methods are more formal and emphasize documentation, planning and control (Cohen, 2004). The methods have been used in projects over a longer time period but gained their real recognition in the IT industry, where the methods are also best known and used. Today, agile methods are a growing trend, and more and more companies are software intensive (Moe, 2020). Companies build products and service around IT. One example is car manufacturers like Tesla, which produces cars that are almost like a computer. Agile methods can also be used in other companies and parts of businesses. It is a growing trend that all types of companies use agile methods like marketing, sales and business development amongst others. For companies to get value of the software, they need to work in the same way as the software development department do. Many industries now use the agile methods when developing products and services because of the high degree of collaboration and more efficient nature of the methodology (Alexander, 2018). The world is getting more complex, and companies need to respond to changes quickly to follow the trends and development in the society. In today's dynamic environment there are few situations where change does not occur (Pawar, 2017). In such times, sticking to agile methodology will make companies better suited to focus on teamwork, customer collaboration and flexibility (Carr, 2017).

Projects that involve uncertainty and high vulnerability among the project goals and solutions need an alternative to traditional project methodology (Wysocki, 2011). The concept of agile is a common term for system development methods that emphasize flexibility, adaptability, and frequent partial deliveries rather than a predefined process (Graves, 2016; Vinekar, 2006; Carr, 2017). Adaptive planning is perhaps the top feature of agile methods. This feature makes it a favorite among project managers worldwide. At the same time, good communication between the customer and the developer of the system is essential. Agile project methodology is used in uncertain projects where you have minor knowledge at the start of a project. Therefore, it is difficult to decide which functions and specifications the customer needs and wants (Boehm and Turner, 2005). Although it is characterized by being an effective approach to modern project methodology, a lot of discipline and coordination is required to compensate for the lack of structure (Boehm and Turner, 2004). It provides a way for teams to deliver a better product at a faster speed, with many companies transferring to a digital workplace (Alexander, 2018). Agile is a perfect fit for organizations looking to transform how they manage projects and how they operate as a whole. Turk, France and Rumpe (2002) argue that the degree of agility in a

development process is defined by the project team's ability to dynamically adapt to the process based on changes in the environment.

Showing the customer that you have an understanding of the process, the presence and have enough knowledge about what to develop when agile methods are used, is crucial to gain the customer's trust. Therefore, satisfying the customer through continuous deliveries of valuable software will have high priority in such methods (Graves, 2016; Serrano and Pinto, 2015). At the same time, the customer must be more involved throughout the process in agile methods, which is quite the opposite to the traditional project methods.

A widely used method in agile methodology is user story. User stories help changing the focus from writing about requirements to talk about them (Cohn, 2020). It provides a description of a solution with business value for the customer or user. The information from such a user story is a brief description of the functions of what is to be developed from a user's perspective. It describes the type of user, what they want and why they want it. Further in the process, the user stories will be treated as a reminder for further communication with the customer's representatives. The user stories are placed in the product's backlog, where the customer can rank the order accordingly to which iterations are to be prioritized (McInerney and Maurer, 2005).

A user story must meet some requirements before it can be allowed in an iteration. "Definition of Ready", DoR, is one such requirement, which is specified prerequisites for this user story (Huether, 2017; Will, 2017). "Definition of Done", DoD, is an agreement between the customer and the developers on what is required to be in place before the solution can be considered complete. This requirement is often standardized so that one can guarantee consistent delivery of quality (Huether, 2017).

The project implementation in agile methods is characterized by short iterations that are repeated until the project's goals have been reached or until the resources in the project have been used. This encourages the team members to have checkpoints at regular intervals to regulate the progress in the process (Pawar, 2017). It will be presented what has been produced to the customer after each iteration, so the customer can look at the progression and come up with requirements they want or change functions they are unhappy with (Avison and Fitzgerald, 2006). It will always be a retrospective perspective where you look back to see if what is being

done works or if you have to make changes. To continue the progress of the project, it is important to know what to continue with, what needs to be stopped, and what needs to be started. The feedback you receive from the customer should be able to help clarify what the next step or what the final solution should be. The collaboration between customer and the development team is to achieve the most functional system possible during the implementation.

Less emphasis will be placed on planning in advance and following a given process, as it is more important to adapt the project to changes in the environment and to adapt the processes to the current problem (Moe, 2020; Sutherland and Schwaber, 2011). In such methods, it is seen as inefficient to spend time planning what will happen far in the future, as this can be associated with uncertainty and frequent changes (Garel, 2013). Figure 14 shows an overall agile project implementation.
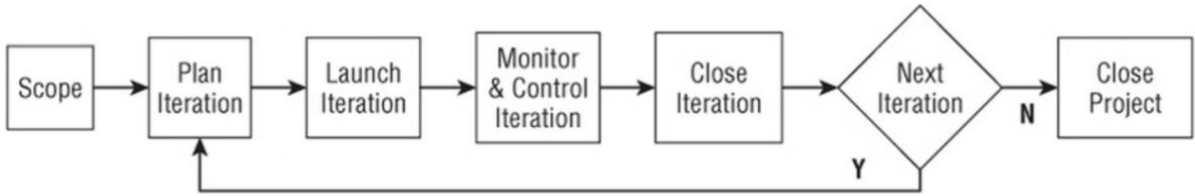
Figure 14: General model of Agile Project Methodology (Wysocki, 2011)

Kashyap (2018) argues that the benefits you get by using agile project management are more clearly defined objectives, controllable processes, clear documentation and more accountability. Agile methods follow a more iterative process where the project's tasks are divided into smaller sprints, which is unlike the traditional approach. This leads to less time spent on upfront planning and prioritization as agile is more flexible in terms of changes and developments in the specification (Titze, 2020).

Today, there are several agile methodologies that are central to use. Examples of this are Scrum, Dynamic Software Development, Extreme Programming, Crystal, Kanban, PRINCE2, Lean Software Development, Scaled Agile Framework and the Adaptive Project Framework (Cohen, 2004). Scrum is maybe the most widely used framework in agile methodology (Carr, 2017). It is especially known for encouraging decision-making and preventing time consumption on variables that are bound to change. Some of the methods will be described and compared more in detail later in this chapter.

4.2.1 Agile Manifesto

Agile methods were first presented in the year of 2000 (Cohen, 2004). These methods are based on how teams can collaborate, self-organize and work by themselves. In 2000, a group of 17 experienced software developers came together to discuss lightweight development methods based on their combined experience, which were alternatives to the heavy document-driven processes that existed at the time (Alexander, 2018). The result of this meeting was a manifesto for flexible software development, also known as the Agile Manifesto, a formal proclamation of four key values and 12 principles to guide an iterative and people-centric approach to software development, as shown in Table 1 and Table 2 (Highsmith, 2009). This became a guide in all agile project models and are still used today.

The Agile Manifesto		
We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:		
Individuals and interaction	over	processes and tools
Working software	over	comprehensive documentation
Customer collaboration	over	contract negotiation
Responding to change	over	following a plan
That is, while there is value in the items on the right, we value the items on the left **more**.		

Table 1: The Agile Manifesto (Cohen, 2004)

The world is getting more complex and agile methods presents ideas on how to respond to increased complexity and changes. Firstly, agile methods favor **individuals and interactions** over processes and tools (Cohen, 2004). There will always be a need for people and that they can work together, negotiate and discuss. Further, the methods prefer **working software** over comprehensive documentation because the day after software is produced, the associated documentation is already outdated. Agile methods support **customer collaboration** over contract negotiation means that customers do not always know what they want. This is why you should talk to the customers to find out their wants and needs, instead of putting everything in the contract. Lastly, agile methods favor **responding to change** over following a plan. The world is constantly changing and the need for enterprises to be responsive to changes and be able to adapt is important to succeed in project work (Moe, 2020).

However, the most important part of all statements associated with agile methods is that **the team must, at regular intervals, reflect on how to become more effective, then tune and adjust their behavior accordingly** (Highsmith, 2001). You have to adjust, reflect and improve processes done during a project. The core idea of agile methods is to adapt and respond to changes based on your reflections in a retrospective perspective. Being agile is not about following a given process, but to be able to adapt processes to the existing problem (Moe, 2020).

The group that developed the values in the agile manifesto also formulated 12 principles that will assist in the process of what one should focus on in agile development projects (Fowler and Highsmith, 2001). Table 2 provides an overview of the 12 principles.

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

Table 2: The 12 principles for Agile Projects (Highsmith, 2001)

4.2.2 Scrum

This section will give a detailed description of the agile method called Scrum. This particular method is chosen because it is the method Signicat uses the most, and also one of the most used agile methods in general.

The Scrum framework aims to help a team through developing, delivering and maintaining complex products. Scrum emphasizes the values of commitment, courage, focus, openness and respect. Versionone (2017) had a survey about agile methods, where 70% of all participating organizations used Scrum. Versionone's thesis addresses the use of agile methodologies for software development. The method uses an iterative, incremental approach to optimize predictability and control uncertainty (Sutherland and Schwaber, 2017). Scrum describes a set of meetings, tools and roles that work together to help teams structure and manage their work. The scrum method was initially formalized for software development projects (Drumond, 2020). It has also been shown to work well for other complex and innovative projects and the principles can be applied to all kinds of teamwork (Alliance, 2016). The Scrum method is based on the previously mentioned Agile Manifesto (Highsmith, 2001; Cohen, 2004).

Sutherland and Schwaber (2017) are seen as the founders of the Scrum method. They have prepared and developed "The Scrum Guide" to describe and explain Scrum further. The framework has three main pillars; transparency, inspection and adaptation. Transparency relates to that the most significant parts of the processes must be visible to those responsible for the results. In order to achieve transparency, there must be a common standard to ensure that those who need insight have a convergent understanding of reality. Inspection means that the users of Scrum must continuously work to detect deviations. Lastly, adaptation means that if deviations are registered, any adjustment must take place quickly to minimize further deviations (Myrvang and Aasen, 2018).

Scrum is based on four different formal events for both inspection and customization as shown in Figure 15. These are standup, sprint planning meeting, sprint review and sprint retrospective (Sutherland and Schwaber, 2017). The standup is a daily Scrum meeting for 15 minutes where the development team coordinate the current day's work. This meeting is about what has been achieved since the previous meeting, what should be done before the next meeting, and problems that have been encountered along the way. The goal of the daily scrum meeting is to align the team on the current sprint's goal, and to get a plan for the next 24 hours (Drumond,

2020). The meeting is often held standing, as most people do not enjoy standing up for a long time, and thus help to keep the time frame and focus. The stand-up is the time to voice any concerns you have with meeting the sprint goal or any blockers.
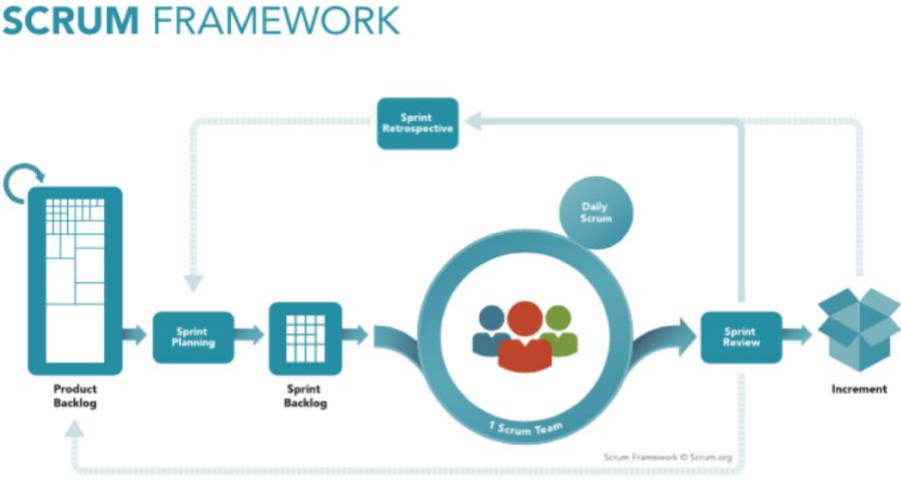
Figure 15: The Scrum Framework (Scrum a, 2020)

The sprint planning meeting creates the plan for a sprint and is prepared in close collaboration with the entire scrum team, which consists of the product owner, development team and Scrum master, as shown in Figure 16. The meeting is led by the Scrum master and the goal for the sprint is made. Specific user stories are then added to the sprint from the product backlog, as mention earlier (Drumond, 2020). The meeting is separated into two parts where the team must define what is to be delivered during the sprint, a strategic part, and what is needed to make the product or increment, a more tactic part. At the end of this meeting, everyone should know the plan and how to reach the sprint goal.

Figure 16: The Sprint Planning Meeting (Scrum b, 2020)

Sprint review is held at the end of each sprint to review the product, view a demo of the increment and customize the product queue as shown in Figure 17. This meeting is informal and intends to trigger feedback that has emerged along the way. More people than only the Scrum team can join this meeting. In the sprint review, discussions about what has worked and what has not worked will be held, as well as discussing problems that have been encountered along the way and how they have been solved (Sliger, 2011). The purpose of the meeting is to discuss the work done in the sprint in a useful way, and to learn for future sprints. The result of a sprint review is a revised product queue, called a backlog.

THE DIFFERENCE BETWEEN
SPRINT REVIEW & SPRINT RETROSPECTIVE

Sprint Review
Is about demoing the work that was just completed.

Sprint Retrospective
Is about identifying areas of improvement to make the next sprint better.
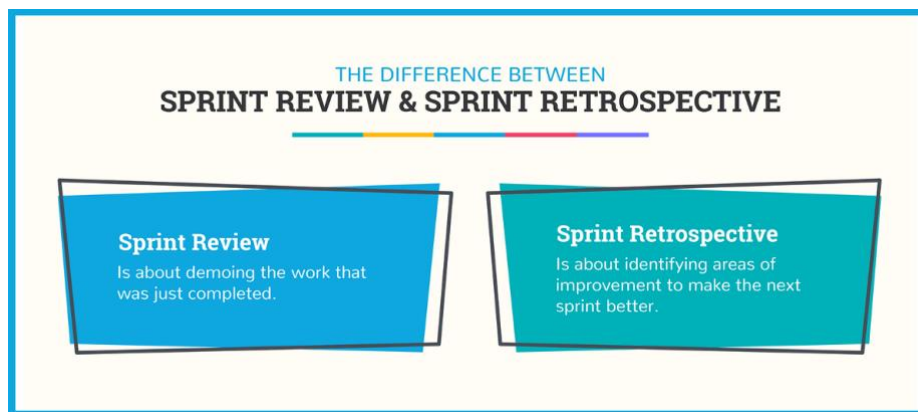
Figure 17: The Difference Between Sprint Review and Retrospective (Dpm,2018)

Sprint retrospective is a backward-look at the completed sprint with the main goal of improving the work methodology for the Scrum team before the next sprint (Sutherland and Schwaber, 2017). The focus will be on the team members, as well as processes and tools, instead of the product. The meeting identifies improvements to be implemented during the next sprint. This, it is the adaption the team makes. Although improvements can be implemented at any time, this meeting is an excellent opportunity to focus solely on inspection and customization.

A sprint is the very "heart of Scrum" and this is where the team works together to finish an increment (Drumond, 2020). This is where a finished, usable and ready-to-deliver product is created. Each sprint is a small project with a length of about two to four weeks. It consists of the sprint planning, meeting, standup, the actual development work, sprint review and sprint retrospective. Sprints often have the same duration throughout the development process, and the new sprint starts immediately after a sprint is completed. The reason why the sprints are never longer is because the complexity will increase with the risk. A sprint will therefore promote predictability and limit uncertainty.

The development team consists of professionals who are needed to make the finished product. The team works as an interdisciplinary, cross-functional and self-organized team. Therefore no one tells the development team how to develop and complete the elements in the product queue. A cross functional team is independent of others outside the team and has the skills needed to perform the work that should be done. By using Scrum, some of the traditional tasks of the project manager are transferred to the Scrum team (Banerjee, 2016). This team model has been used to optimize flexibility, creativity and productivity.

A Scrum team consists of a product owner, the development team and a Scrum master, although the teams often have special expertise or special focus areas, the responsibility belongs to the whole team.

The product owner owns the product in development, is responsible for handling the product's backlog and ensure this is visible, open and ready for everyone. The person must also optimize the value of the work from the development team, at the same time as he or she must ensure that the development team understands the elements (Schwaber and Sutherland, 2017).

The Scrum master is responsible for maintaining a flow of development in accordance with Scrum's framework. In addition, the Scrum master is also responsible for arranging daily Scrum meetings with the development team, protect the team from irrelevant tasks and work as a connection between the development team and the rest of the organization (Banerjee, 2016).

Scrum is described as a framework because less emphasis is placed on specific techniques and it is possible to implement only parts of it. According to Alliance (2016), Scrum can therefore be adapted to different techniques and methods, and at the same time function as a tool for management and organization. Schartum and Sørensen (2014) present this as one of the reasons why the framework has become so widespread (Schwaber and Sutherland, 2017).

The development team is a cross-functional and self-organizing team consisting of three to nine people. The team is organized with a hierarchical structure with developers that is responsible for delivering results. They need to work together to achieve the goal for the development in each sprint (Schwaber and Sutherland, 2017).

4.2.3 Kanban

This section will give a detailed description of another agile method called Kanban. After Scrum, Kanban is one of the most common methods to use, although it does not originate as an agile method (Radigan, 2020). Kanban is a preferred method in Signicat, which makes it relevant in this thesis (Appendix 9.1.6). The method started at Toyota with their efficient production system in the 1940s (Radigan, 2020).

Already in the late 1940s, Toyota began optimizing their engineering processes based on the supermarket model to stock their shelves (Radigan, 2020). Supermarkets optimize the flow between store and consumer as the inventory level matches the consumption pattern. This means that products for the consumers are always in stock. The manufacturing process is called "just in time" (JIT) and is later used by software developers.

Kanban differentiates itself from other methods as it focuses on where an organization is today. Hence, requirements related to creation of new roles, ceremonies or structures before the work getting started will not exist in this method (Dingsøyr, Falessi and Power, 2019). The method is more flexible than Scrum as it is not as specifically set up, but it is more optional what you want to do (Appendix 9.1.6). Kanban has six main principles: visualize workflow, limit work in progress, manage flow (JIT), make policies explicit, implement feedback loops, and continuous improvement, as shown in Figure 18 (Chiva, 2020).

Figure 18: Kanban practices (Chiva, 2020)

The Kanban method is a process for gradually improving the processes that take place, especially in software development, but also in other IT activities, recruitment, marketing and sales (Digité, 2020). It is an effective approach for organizations to achieve better business flexibility (Kanban University, 2020). The main principles of the Kanban framework are timeless and can therefore be used in most industries (Radigan, 2020). The method embraces the constant change that lies in managing knowledge work and enabling IT, insurance, financial services and global organizations to become more cooperative productive and cohesive in the face of increasing competitive pressure and organizational chaos (Kanban University, 2020). As with many other agile methods, it is the software developers who really succeed with the method. This is because a software team can start the method with small-scale testing and understanding of the basic principles, while for an entire factory, such a change will require significant changes in physical processes and significant materials. For a software development team, this can be done as easily as with a virtual board.

The work for a Kanban team is focused on the Kanban board and pull production, which is shown in Figure 19. The board is a characteristic of the method which makes it so unique (Radigan, 2020). It will function as a tool for visualizing work and optimizing the workflow in the team (Radigan, 2020). Originally, these boards were physical, but digitalization has led to an increase in virtual boards that simplify work and increase the opportunity to collaborate and the availability of the team.
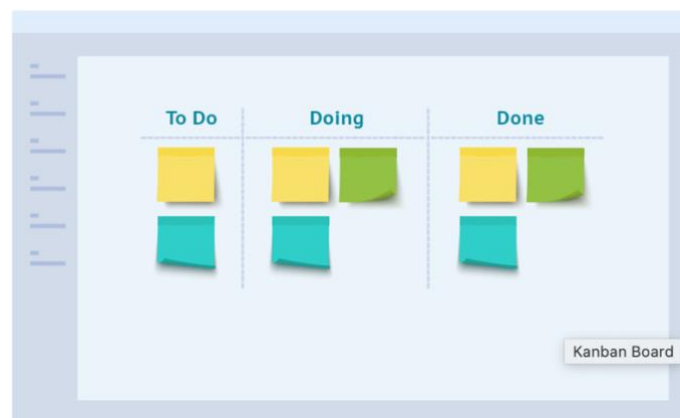
Figure 19: The Kanban Board (Digité, 2020)

Whether the board is physical or digital, the function is to ensure the team's work. This involves both visualization of the work, that the workflow is maintained and that no tasks are forgotten or avoided. As shown in Figure 19, the Kanban board usually has three steps: to do, doing and done (Digité, 2020). In a Kanban process, it is crucial that the whole team has good

communication and is honest about the tasks' progress. The Kanban board is what determines which tasks are solved. Therefore, it is vital that the board is correct and updated at all times.

4.2.4 Scaled Agile Framework

There are numerous methodologies out there trying to frame the challenge of scaling agile to enterprise level (Appendix 9.1.3). Figure 20 shows the six most important scaled frameworks. The most used method, but also the most complex one, is the Scaled Agile Framework (SAFe). SAFe is an interactive software framework that enables you to apply different agile practices, like Lean and Scrum, at large enterprises (Agilest, 2021; Piikkila, 2021). The framework includes structured guidance on roles and responsibilities and how to plan and manage work, as well as important values (Rangaraj, 2021).
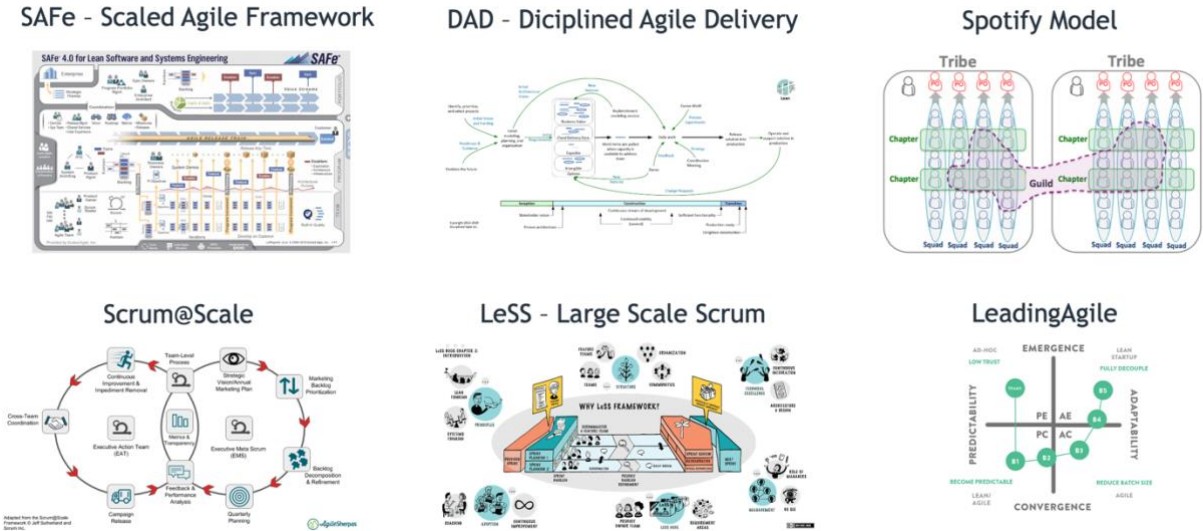
Figure 20: Different scaling agile frameworks (Appendix 9.1.3)

Signicat has a desire to move towards this framework and believes that they have the competence to manage it (Appendix 9.1.3). The only thing missing is prioritization of time, resources, and a management that is willing to implement this. Signicat did an internal project during the autumn 2020 to move towards a scaled agile approach for the whole company, but it only succeeded at team level. It is therefore considered relevant to explain this framework in this thesis.

The full configuration of SAFe involves four levels, which are defined differently based on who you ask. This thesis will be based on the four levels from Piikkila (2021) and SAFe (2021)

which are Essential SAFe, Large Solution SAFe, Portfolio SAFe, and Full SAFe. Agilest (2021) will say that the distribution consists of Team, Program, Large Solution, and Portfolio. The following sections will explain and describe the four different levels of SAFe.

4.2.4.1 The Essential Level

The Essential level is the most basic configuration of the framework and it provides the minimal elements necessary to be successful with SAFe (SAFe, 2021). This level contains only three of the core competencies, agile product delivery, team and technical agility, and lean-agile leadership, as shown in Figure 21. Agile product delivery is a customer-focused approach to create valuable products and services for customers and end-users (Diaz, 2019; SAFe, 2021). To achieve customer satisfaction and deliver the desired products and services, one must create the right solution for the right customer at the right time. In other words, the customer should always be the focus point and a continuous dialogue with the customer throughout the process is essential. Agile product delivery is a core competency in all four levels of SAFe and is divided into three dimensions: customer centricity and design thinking, develop on cadence; release on demand, and devops and continuous delivery pipeline.
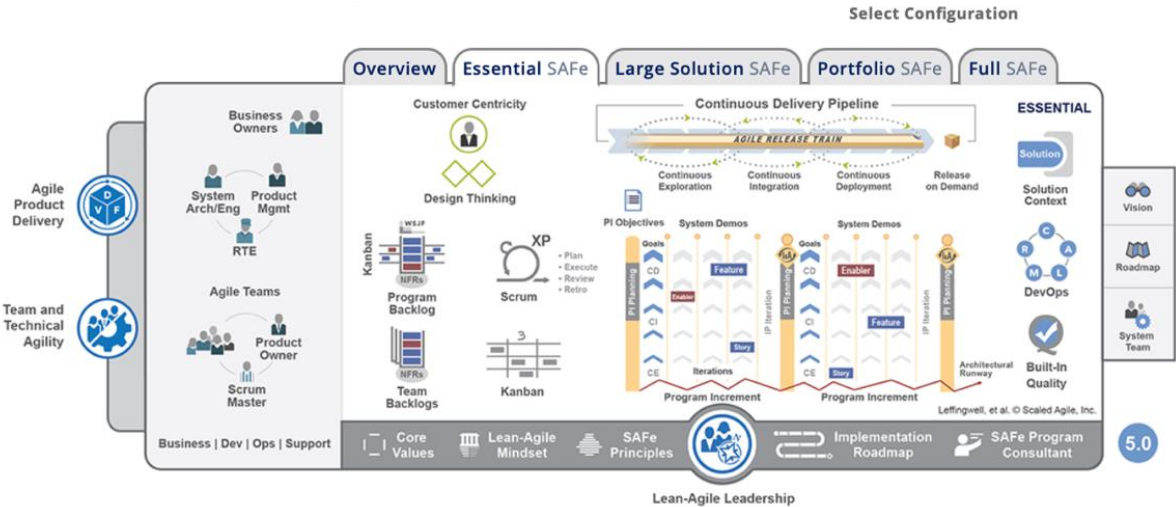
Figure 21: The Essential Scaled Agile Framework (SAFe, 2021)

The expertise in team and technical agility is used in high performing agile teams. The method describes critical skills and principles from the Lean method, and it is about creating high-quality solutions for customers (SAFe, 2021). Using agile teams creates good business solutions that provide value for customers with their customized needs. Therefore, an organization's ability to thrive in the digital age depends on the team being able to deliver solutions that meet the customer's needs and wants. Technical agility is based on the availability and change of

technology, and how fast new technologies are released (Fogarty, 2001). The competency is divided into agile teams, built-in quality, and teams of agile teams.

The last competency for this level is the Lean-agile leadership which describes how managers in a Lean-Agile company develop the company by inspiring individuals and teams to reach their maximum potential (Küsters, 2016; SAFe, 2021). This can be done by leading, by using SAFe's mindset, values, practices, and principles and helping to push companies into a positive development by adopting a new way of working. Managers, executives, and other leaders in organizations are responsible for success, business agility, and Lean-agile development (SAFe, 2021). It is divided into mindset and principles, leading by example, and leading change.

4.2.4.2 The Large Solution Level

The Large Solution level is for enterprises that are building large and complex solutions, which do not require the constructs of the portfolio level, as shown in Figure 22 below (SAFe, 2021). This level contains one more competency than the essential level, which is the enterprise solution delivery. This competency describes how to apply Lean principles and practices to the specification, development, distribution, operation, and development of large software applications and networks (Diaz, 2019; SAFe, 2021). Enterprise solution delivery is divided into three dimensions: Lean systems and solution engineering, coordinating trains and suppliers, and continually evolve live systems. These dimensions can be divided into nine practices from Lean to coordinate necessary activities throughout the process of creating a system (SAFe, 2021; Küsters, 2016).

1. Continuously improve the fixed or variable solution intent.
2. Use multiple planning horizons.
3. Architectural choices for scale, modularity, serviceability, and releasability.
4. Continually pay attention to compliance concerns.
5. Build and integrate solution components and capabilities with agile release trains (ARTs) and solution trains.
6. Apply continuous integration.
7. Manage the supply chain with systems thinking systems.
8. To build a continuous delivery pipeline, which constantly and automatically makes small updates and developments and test them in different environments.
9. Evolve deployer systems.
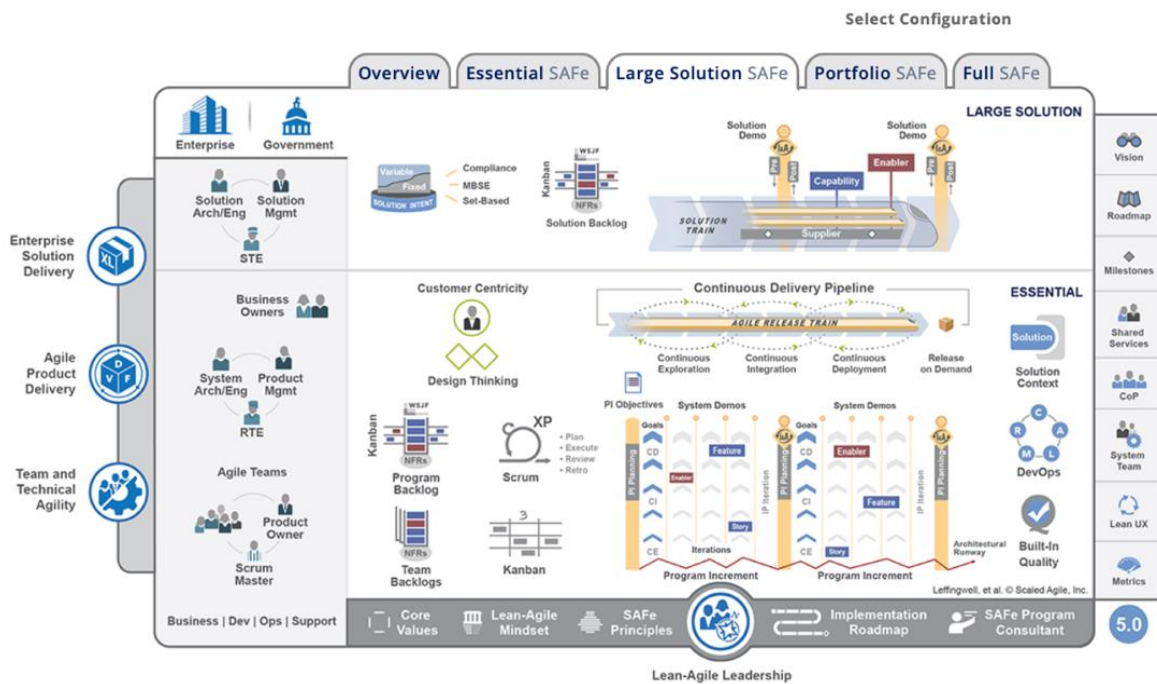
Figure 22: The Large Solution Scaled Agile Framework (SAFe, 2021)

4.2.4.3 The Portfolio Level

The Portfolio level provides portfolio strategy and investment funding, agile portfolio operations, and Lean governance (SAFe, 2021). This level contains more competencies than the previous two, as shown in Figure 23 below. Organizational agility is the first, which together with the other similar core competencies, is about how Lean-thinking and agile teams optimize and develop a new strategy in organizations (Rigby, Sutherland and Noble, 2018; SAFe, 2021). This means new commitments, fast and efficient adaption when changing and openness to new opportunities. In an increasingly digital world, the biggest sustainable competitive advantage in finance will be the speed an organization spends responding to customer needs (SAFe, 2021). This is about delivering value in the shortest possible sustainable time. At the same time, it is about developing and implementing new strategies and solutions quickly and reorganizing to handle new opportunities (Küsters, 2016; SAFe, 2021). Organizational agility is divided into Lean-thinking people and agile teams, Lean business operations, and strategy agility.

Lean portfolio management is about adjusting strategy and execution with approaches from Lean and system thinking to investment funding and strategy, agile portfolio operations, and management (SAFe, 2021). This is more about the financial aspect than the previous core competencies and is can only be found in the last two levels of SAFe, portfolio and full. Here,

the SAFe portfolio is described as a collection of value streams for a given business domain within a company. Each value stream has the task of delivering solutions that will help the company fulfill its business strategy. At the same time, they will develop products and solutions for internal challenges or external customers. May (2021) believes that the challenge of connecting agile teams into an agile enterprise is the gap between the teams doing the work and the teams allocate the funding. Leaders must therefore gain visibility, figure out what works, and optimize investments, to close the gap between the teams. Based on knowledge from SAFe (2021) and May (2021), Lean portfolio management became more necessary because the traditional approach was not designed for the global economy or the digital development in the society. This means that companies must work with a higher degree of uncertainty at the same time as innovative solutions are expected. Table 3 shows how some of the portfolio practices are still outdated, while others have followed the development (Carr, 2020).

Traditional Approach	Lean-Agile Approach
People organized themself into functional groups and temporary project teams.	People organized value streams/ARTs; continuous value flow.
Fund projects and project-cost accounting.	Fund value streams, Lean budgets.
Big up-front, top-down, annual planning and budgeting.	Value stream budgets adjusted dynamically; participatory budgeting.
Centralized, unlimited work intake; project overload.	Strategic demand managed by the Kanban portfolio; decentralized intake by value Streams and ARTs.
Too detailed business cases based on speculative ROI.	Lean business cases with MVP, business outcome hypothesis, agile forecasting and estimation.
Projects governed by phase gates; waterfall milestone, progress measured by task completion.	Products and services managed by self-managing ARTs; objective measures and milestone based on working solutions.

Table 3: Evolving traditional portfolio mindset to a Lean-Agile approach (Carr, 2020; SAFe, 2021).

A continuous learning culture is the last core competence and is found in the last two levels of SAFe: portfolio and full. The competence describes a set of values that encourage individuals to continuously increase their knowledge, competence, performance, and innovation, in addition to encouraging the company as a whole to the same (SAFe, 2021). To achieve this, the company must become a learning organization, focus on continuous improvement and development, and innovation. A continuous learning culture is divided into learning organization, relentless improvement, and innovation culture (Küsters, 2016; SAFe, 2021).
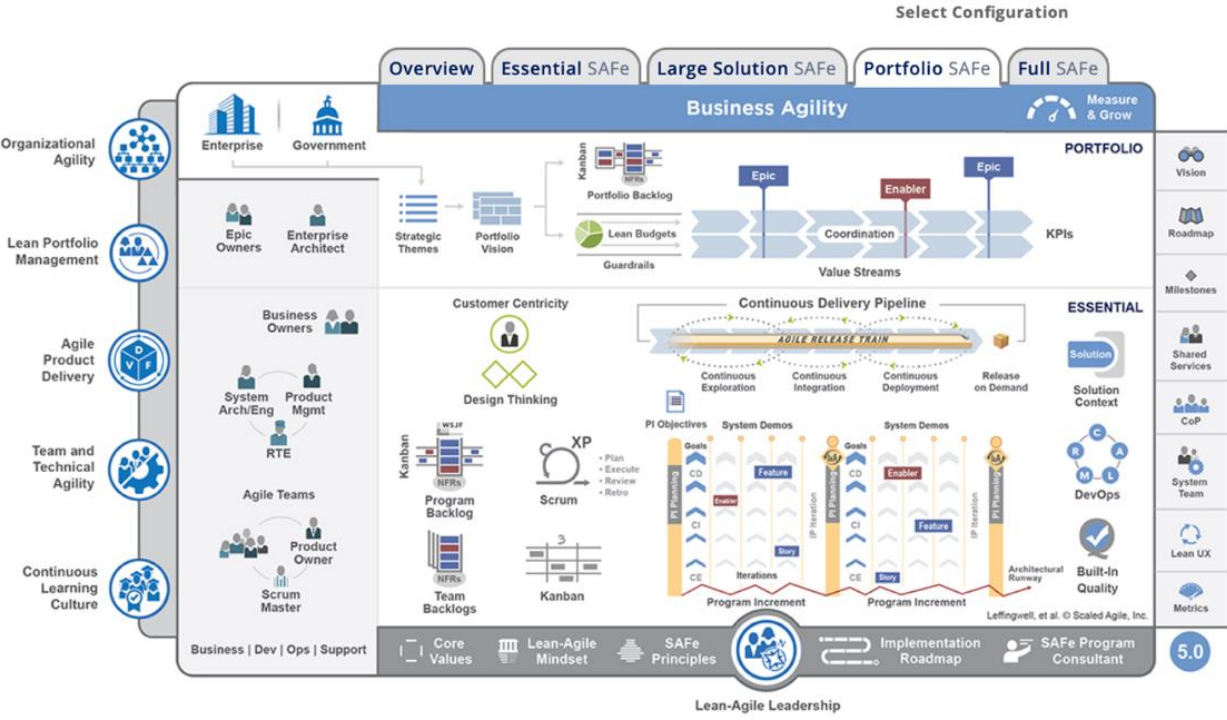
Figure 23: The Portfolio Scaled Agile Framework (SAFe, 2021)

4.2.4.4 The Full Level

Full SAFe represents the most comprehensive configuration, and companies are struggling to reach this level, as seen in Figure 24 (SAFe, 2021). It supports building large, integrated solutions that typically require hundreds of people or more to develop and maintain. This is the highest level of SAFe where executives and leaders determine the organization's visions, business goals and strategies (Agilest, 2021). SAFe is a tool for helping organizations to handle challenges related to financing, product mapping and change management. The tool shows how to use Lean principles to measure progress. Visions and business are planned by the management team in a company, but with SAFe, it is easier to break down small tasks to the

programming level for the relevant teams. As seen in the figure below, the level requires all the seven core competencies, that are already explained, to be completed.
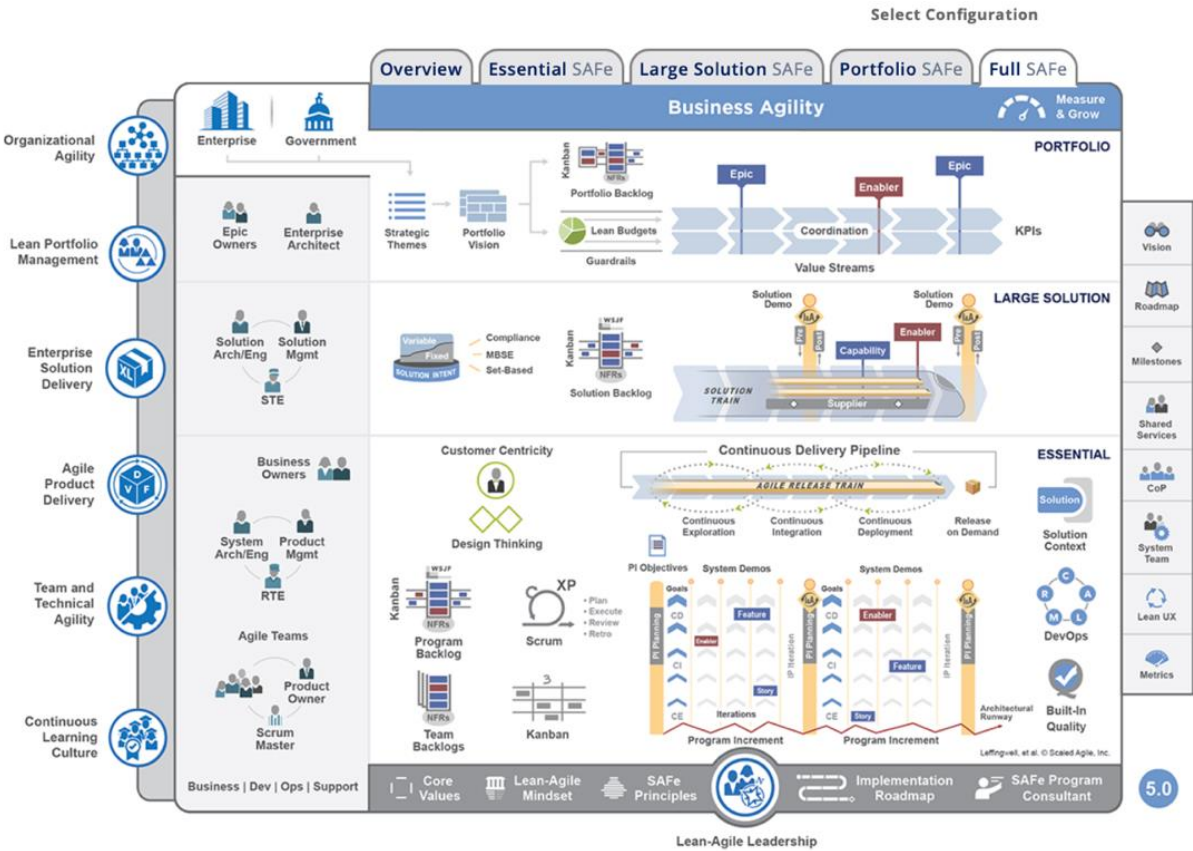
Figure 24: The Full Scaled Agile Framework (SAFe, 2021)

The differences between the levels will be that extra features are added for each level. The Essential SAFe is the most basic, where functions, more people and bigger integrations are added to the higher levels.

4.3 Summary of the theoretical framework

In the theory chapter, both traditional and agile methods have been explained. The theory has mainly focused on agile methods where both characteristics of the methodology and description of three different agile methods have been given. The methods will be used as a reference in the further analysis and discussion. Based on the literature, advantages are expected when using these methods in projects as it is necessary to respond to changes to keep up with the digitalization in the complex world we face today.

According to the theory, agile methods are different work methods that focuses more on flexibility, customer success and individual differences, as well as being able to adapt and adjust. Projects performed with an agile method involve the customer in all steps during the process and have an iterative organizational structure. This leads to more satisfied customers as they feel a more inclusive role in a project and can be involved throughout the process. With an iterative organizational structure, the project team will be more structured. In addition, all the project members will be involved or informed at all times and may feel a stronger ownership towards the project. Such a project will often be more successful, especially from the customer's point of view, as it can contribute and provide input about their thoughts on the ongoing work.

5. Analysis

This chapter will present the result of using the selected methods based on the analysis of the various agile methods presented and how these occur in Signicat. The information about Signicat has been conducted through interviews and dialogue with the employees. The remaining information is collected through the literature study in Chapter 4.

5.1 Differences between traditional and agile project methodology

Kashyap (2018) has made a table with the differences between the two types of project methodology which is shown below in Table 4.

Characteristics	Agile approach	Traditional approach
Organizational structure	Iterative	Linear
Scale of projects	Small and medium scale	Large-scale
User requirements	Interactive input	Clearly defined before implementation
Involvement of clients	High	Low
Development model	Evolutionary delivery	Life cycle
Customer involvement	Customers are involved from the time work is being performed	Customers get involved early in the project but not once the execution has started
Escalation management	When problems occur, the entire team works together to resolve it	Escalation to managers when problems arise
Model preference	Agile model favors adaption	Traditional model favors anticipation
Product or process	Less focus on formal and directive processes	More serious about processes than the product
Test documentation	Comprehensive test planning	Tests are planned one sprint at time
Effort estimation	Scrum master facilitates and the team does the estimation	Project manager provides estimates and gets approval from PO for the entire project
Reviews and approvals	Reviews are done after each iteration	Excessive reviews and approvals by leaders

Table 4: Differences between Agile and traditional project methodology (Kashyap, 2018)

Table 4 shows different characteristics that belong to the two different project methodologies. It is obvious that the traditional column shows a methodology with structure and clearly planned events. According to Kashyap (2018) and Spundak (2014) traditional projects follow a fixed sequence of initiation, planning, implementation, and have a defined set of methods, techniques, procedures, rules, and templates, which the table also confirms. Such a method should guarantee robustness and applicability to a wide range of projects, both simple and small, but also more complex and large projects. Customers get involved early in the process but not once the execution has started, which means that the customers have low influence in the projects.

The agile column is more iterative and involves the customer and user throughout the process. This is a methodology that can be adapted to most types of projects, as opposed to the traditional one, which is starting to become outdated. In an agile project, the entire team is involved in making decisions and the necessary stakeholders and interests are involved and included in important decisions. The traditional methodology focuses mostly on the project manager taking this responsibility and making the decisions on their own. In agile projects, specialists will make the professional technical decisions, while the project manager will act as a coordinating part between the project participants. Such a methodology will also make it easier to fix problems because they often become visible earlier in the process as the agile method uses retrospect to look back at whether things are working or not. The goal is to "fail fast" to be able to repair problems as early as possible in the process.

Signicat has made their own comparison of traditional versus agile project methods, as shown in Figure 25 (Appendix 9.1.3). The blue column is principles that characterize Signicat today, similar to a more traditional methodology, and the green is agile principles that Signicat wants to develop towards.
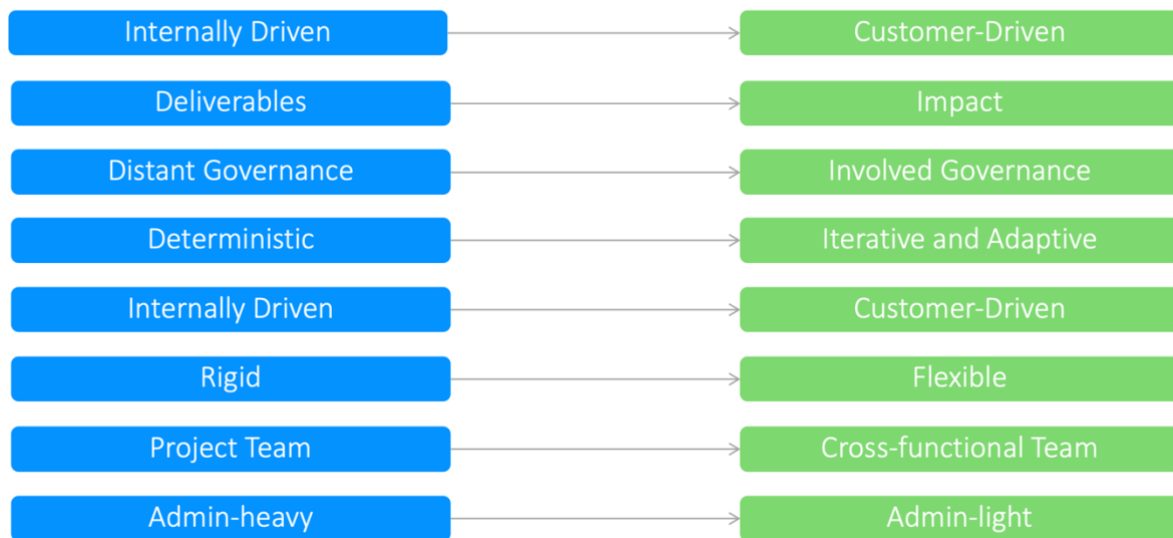
Figure 25: A desired development from traditional to agile project methodology in Signicat (Appendix 9.1.3).

It is a desire from Signicat's point of view to make a move from the blue column over to the green and agile side. Similar to Table 4 above, which describes customer involvement between the various methodologies, the top row in this figure is about how projects are run. In Signicat, the projects are run internally while an agile project is run by the customer. Signicat tries to get best deliverables, while the agile mindset wants to make a difference that matters and has an impact to the company. Distant governance towards a more involved governance is about who makes decisions and manages the project. In Signicat this responsibility belongs to the management and the project manager, while in agile projects it will be the specialists who make the technical decisions. The project manager makes decisions between the disciplines and is responsible for the communication in agile projects.

Deterministic and rigid are characteristics of a traditional way of thinking in Signicat where procedures and implementation are set. Iterative and adaptive are, instead, characteristics in a more agile project where there will be flexibility so things can change along the way. The actual project team in the two columns are different as well, where Signicat has given project teams working on the project, while there is a desire to move towards a cross-functional collaboration where all the necessary disciplines in a project are put together into a more interdisciplinary project group. Today there is a lot of administration to be done in connection with the projects, while the goal is to reduce this and move towards the agile manifesto of Cohen (2004) who says that working software should be prioritized over comprehensive documentation.

5.2 Differences between the agile methods

Different sources and literature describe the agile methods differently. This section will provide an analysis of the different agile models that explain differences and similarities. Table 5 below presents the different agile methods and their associated characteristics. The information in the table is based on the following sources and references: Digité, 2020; Dingsøyr et al, 2019; Piikkila, 2021; Poppendieck and Poppendieck, 2013; Radigan, 2020; SAFe, 2021; Sutherland and Schwaber, 2017.

Characteristics	Scrum	Kanban	Scaled Agile
Cadence	Regular fixed sprints contain few topics with specific time limits	Continuous flow	More predictable cadence with short iteration cycles, similar to scrum
Framework	Meeting: sprint planning, daily scrum, sprint review, sprint retrospective	Kanban board	A set of organization and workflow patterns for implementing agile practices at enterprise scale
Business Areas	Started in software development, now it has developed into all industries	Started in software development, later extended to all types of business areas	The whole enterprise
Focus Areas	Success in the team and work together effectively, how to adapt processes to an existing problem and customer value	Focus on where an organization is, not how to change everything. Focus on customer success and work together as a team effectively	Alignment, built-in quality, transparency, and program execution.
Key Metrics	Velocity, the number of finished sprints	Lead time and cycle time, what it takes for a task to go from start to finish	Objective evaluation of working systems, cadence-based development, continuous delivery, DevSecOps, and connected Kanban systems

Organizational Structure	Iterative	Board, list and cards	Iterative cross-functional
Origin in recent times	Software development	Toyota Automotive	Lean-agile software and systems development
Hierarchy	Self-managing and cross-functional. Product owner, scrum master and development team	No required roles, the whole team owns the Kanban board	Cross-functional
Release Methodology	At the end of each sprint	Continuously delivery	Agile Release Train (ART), release on demand

Table 5: Differences and similarities between the agile methods

The three different methods, Scrum, Kanban, and Scaled Agile Framework (SAFe) are all agile methods and have some similarities. Cadence in the three methods will be slightly different where scrum has a given length on each sprint, usually two weeks, before the tasks belonging to the relevant sprint must be completed (Drumond, 2020). Kanban has a more continuous flow where tasks are prioritized, but they do not have the same given deadline as the sprints in scrum have. SAFe often uses scrum, lean or Kanban as its chosen agile method in the framework and it will therefore vary depending on which method is used. Nevertheless, it is more predictable than "regular" Kanban as it has short iteration cycles for each task.

According to Sutherland and Schwaber (2017) scrum is based on four different formal events or ceremonies during the process. These meetings are sprint planning, daily scrum standup, sprint review, and sprint retrospective. Radigan (2020) explains that the Kanban board is the most important in that process where all the tasks must be updated on the board to inform whether the task is planned, in process, or is marked complete. SAFe is a framework itself and is according to SAFe (2021) a set of organization and workflow patterns for implementing agile practices at enterprise scale.

The business area of the various methods has had their main focus in the software development but is heading towards all types of business areas and enterprises now. Kanban, for instance, is an effective approach for organizations to achieve better business flexibility (Kanban

University, 2020). With an increasingly growing digital world, such flexibility and changeable methods will be necessary to keep up with the development.

The focus areas of the methods have different characteristics where scrum is about success in the team that will work together as effectively as possible and how to adapt processes to an already existing problem to give the customer value. Kanban differentiates itself from other methods as it focuses on where an organization is today, instead of trying to change it (Dingsøyr et al. 2019). The focus is also on customer success and how to succeed as a team. In SAFe, it is more about making the framework a standard for the entire organization instead of focusing on one team. Important keywords will therefore be alignment, built-in quality, transparency, and program execution.

Scrum can measure success in velocity and the number of finished sprints, while Kanban focuses on lead and cycle time, i.e., the length of an entire process, from start to finish. Scaled Agile measures success more in whether systems work, whether you get the framework to work on larger parts of the organization, and deliveries.

Both scrum and SAFe have an iterative organizational structure. Kanban, on the other hand, has the well-known Kanban board and Kanban cards with "to do", "doing", and "have done". As mentioned in the business area, scrum has its origin in software development, while Kanban started at Toyota with the manufacturing process JIT (Radigan, 2020). SAFe comes from lean-agile software and systems development.

Team division and hierarchy in the various methodologies will in scrum be self-managing and cross-functional where the desire is to have interdisciplinary teams from all disciplines. The product owner and scrum master are still the "bosses" in such a project. Kanban has no given roles or areas of responsibilities (Dingsøyr et al. 2019). The whole team is equally responsible and owns the Kanban board. In SAFe, the team try to be cross-functional, which is something scrum also aims to achieve. SAFe is about more than just the team, but the whole organization as it is a larger framework.

Scrum differentiates itself from the others as the release methodology is decided at the end of each sprint while Kanban has continuous delivery throughout the process and SAFe has agile release trains with focus on release on demand.

5.3 Findings from the interviews

In the interview with the product manager, Appendix 9.1.1, Signicat's project methodology was highlighted together with a description on FTN. The other interviews, Appendix 9.1.2-9.1.9, address various aspects of the MitID project in addition to describing Signicat's relationship to agile methods and how they are used in the company. Results from the qualitative analyzes were confirmed through the interviews and all informants point out that agile methods are easier to use in smaller teams. There are various opinions about agile methods in projects in Signicat. Some of the informants have good experience with it and want to use it again, while others have experienced that it does not work. The sources of the information in this section are from the employees in Signicat, mainly from the interviews in Appendix 9.1.

5.3.1 The FTN project

Due to a small number of employees being involved when the FTN project started, there was no need for a special project methodology in Signicat (Appendix 9.1.1, question 9). All the employees knew each other so well. Hence, problems or questions that arose were easily solved or answered and all employees were happy to contribute to areas beside their main specification as everyone had a common goal. Their common goal was to succeed with the project. This meant that agile methods were not one of the characteristics of the project.

Nevertheless, several agile principles were noticed during the project, without this being planned. The employees became aware that the need for more information and a structure for prioritizing tasks was growing, especially at the product level (Appendix 9.1.1, question 9). This resulted in more planning, as well as troubleshooting during the project and to separate tasks into smaller parts. They kept looking back to assess the work that had been done and whether the customer had any input. This can be related to the scrum method where tasks are divided into sprints and the focus is on the retrospective part of the project. Signicat used flexible methods in the project without being aware of it. During the project Signicat got input from the customers on their requirements and wishes, which is a desire to achieve in Signicat as shown in Figure 25. In addition, there was a wish from the company to invest internal resources in new integrations and functions. This made the prioritization of resources more difficult. The combination of both external and internal wishes was probably the background for the development and associated learning process towards the use of agile methods.

FTN was performed ad-hoc as all the project participants knew each other so well that they always knew who was responsible for which tasks and could easily communicate with each other if needed. The employees had an inner motivation and felt an ownership for the project which led to everyone being interesting in contributing and going the extra mile to finish different tasks if they had the time and energy to do so.

When working with the FTN project, Signicat consisted of few employees and the use of agile methods was not crucial. However, towards the end of the project the number of employees had increased considerably and the need for a project methodology was bigger. This resulted in employees becoming more open to a development towards a more agile approach.

The finding that an agile approach developed gradually is perhaps what makes this project so special and unique. Companies often actively decide to introduce agile methods, but in Signicat with the FTN project, there seems to have been a more organic development towards such an agile approach. The experience and knowledge learned from the FTN project can be useful for upcoming projects in Signicat. Although FTN was not particularly well structured or planned, it ended up being a successful project. Accordingly, there is no single conclusion on how projects or tasks should be executed and solved. The most important thing is that the processes are adapted to the project, which is one of the focus areas in the scrum method as shown in Table 5. All projects are individual and have their own factors to consider on the road towards success.

5.3.2 The MitID project

Even with more employees in the organization and a greater need for a given project methodology, there has not been 100% structure and overview in MitID either. An attempt at an agile approach and a better project organization with a given project team and steering group has been carried out. Compared to FTN, MitID is a bit more structured and planned, but there are still too many "moving parts" (Appendix 9.1.2, question 5).

Several employees have led to the given roles being more specified in contrast to earlier when it was performed by those who had the time and capacity to do it (Appendix 9.1.2, question 12). This hierarchy with more specified roles and responsibilities is a characteristic in the scrum method, as shown in Table 5. At the same time, more specified roles provide more structure and overview (Appendix 9.1.8, question 8). Going from an organization where everyone knows

everyone, to getting bigger where one no longer has the time or capacity to react when new employees are added to communication channels, can result in poor overview of the employees, and that the new ones feel less welcome (Appendix 9.1.2, question 12). All those involved in MitID have had a common goal of succeeding with the project, although there have been slightly different opinions on how to get there.

During MitID a project tool was developed to get a better overview of the project process and to see who was responsible for what, as mentioned earlier and seen in Figure 6 (Appendix 9.1.2; Appendix 9.1.4). Having more focus on the process than the product is according to Table 4 a characteristic of a traditional approach and against the agile manisfesto. The process tool was initially a helpful tool, but the project group did not get the organization or TMT to tell everyone to work this way. In other words: it was not prioritized, and the project tool did not give the benefit that it could have done. This is a recurring problem in Signicat where the management is not clear enough on which project methodology to use. A project without a given project methodology can lead to uncertainty and the employees may end up choosing the method they want. This means that the organization does not receive joint communication regarding the choice of project methodologies.

The marketing department has participated and been important during MitID. Signicat will include this in future projects to ensure a good dialogue with the marked as they have achieved in MitID (Appendix 9.1.2, question 6). Many surveys have been conducted towards the market in order to know what is in demand and wanted at all times (Appendix 9.1.8, question 5-6). Signicat has not known what the complete result or solution will be, but they have communicated to the customers and informed about the status during the whole process, how far they have come, how they predict things to be and have had a close dialogue with the customers about their wants (Appendix 9.1.2, question 6). Customer focus belongs to all the agile methods compared in Table 5 and is probably one of the most important characteristics of agile methods in general.

In MitID, the Danish government have determined the scope, framework, and deadlines, which makes a project more traditional. This means that it is not possible to carry out the project in a 100% agile way (Appendix 9.1.6, question 5). MitID has very clear requirements for what is expected, but third-party suppliers develop and work on the project along the way and make

changes (Appendix 9.1.7, question 8). The project as a whole is therefore more like a waterfall-type project, even though the development team runs Scrum and is agile.

Set up and changes in the development team has created chaos and unpredictability which has been a challenge during the MitID project (Appendix 9.1.6, question 4). This has also led to uncertainty regarding how much time and resources one should use and what should be prioritized. In addition, there have been several domains and several product owners in each team that have made it difficult to synchronize. Signicat has until recently had characteristics like a start-up mentality where everyone has more than one role and takes too much responsibility (Appendix 9.1.6, question 13). In a start-up, employees should have more responsibility and do more tasks and roles. As it grows, the roles will become more established and grow into full-time positions. Given roles and specific tasks will therefore be important as a company grows.

5.3.3 Comparison of FTN and MitID

The two projects FTN and MitID may look similar because they produce similar solutions within digital identity. Nevertheless, there are many differences, and some similarities, that will be explained further in this subchapter.

Similarities between the two projects

The end result in both of the projects, a newer and better solution for digital identity, is one important similarity with the technical integrations and programming part. Signicat's role in the projects, as a broker, is another similarity. That role is regulated and contains given security requirements to maintain a certain level of security for the service providers.

The project methodology in the two projects looks superficially similar. In FTN, there was little to no form for project methodology. All the employees knew each other, and things were done ad-hoc and by those who had the time. There were few specified roles among the employees, and everyone was part of the project. Even though the company is significantly larger in the number of employees during MitID, the project methodology has still been quite chaotic. This can be explained by the COVID-19 pandemic and that the team was split between Norway and Denmark. The FTN team was also split between two countries, Norway and Finland but did not experience any problems related to it. The MitID team has had challenges with time, resources,

priorities, and communication (Appendix 9.1.2, question 8). Therefore, the MitID project ended up almost as chaotic as FTN, although better planning was attempted with a clearer project methodology.

Neither MitID nor FTN were agile projects but ended up as waterfall projects. This is probably due to the fact that they had a given scope and framework with given deadlines and dates set by external owners and authorities. Although both projects had software development carried out with Scrum and in sprints, the main emphasis of the projects was carried out more traditional as a waterfall project. This means that none of the projects had a given project methodology, so the few agile characteristics have taken place naturally.

Differences between the two projects

It may seem that there are many similarities between the projects, but if one dive a little deeper one will realize that the similarities are actually differences.

Although both FTN and MitID had poor project methodology, MitID was probably a bit more structured and planned than FTN with a project manager and project group (Appendix 9.1.2, question 5). Nevertheless, there are far too many moving parts in MitID that makes the project difficult to structure. During FTN, Signicat was growing rapidly, which was also the case during MitID. During the Danish project, both the project group and Signicat as an organization were flowing. Signicat has changed the management and reorganized three times during the project. The same applies to the project group itself, where roles have been changed up to several times. A software project like MitID is difficult to predict and know what needs to be done from the start, things change along the way that create uncertainty and unpredictability. In addition, it is difficult to deal with customers who do not know what the project will result in but have many wishes and thoughts. This has made the project complex and difficult to predict.

In retrospect, it is easy to see what should have been done differently. At the same time, it is strange that Signicat did not learn more after FTN about how to solve such projects. Maybe the projects are more different than they seem? A clear lesson from MitID is that such a project requires close coordination between all the departments involved similar to a cross-functional hierarchy as shown in Figure 25 about Signicat's desired development towards an agile approach and Table 5 about scaled agile framework. Therefore, all the departments in Signicat have been involved in the project as a coordinating team (Appendix 9.1.2, question 5). FTN

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was mainly run by the Finnish sales office instead of a project team. MitID is run by a project manager together with a project group consisting of technology, product, sales, customer success, and the marketing department in Denmark. This project group is shown in Figure 26 as the inner coordinating team supported by the outer layer as an executing team existing of the rest of the involved departments.
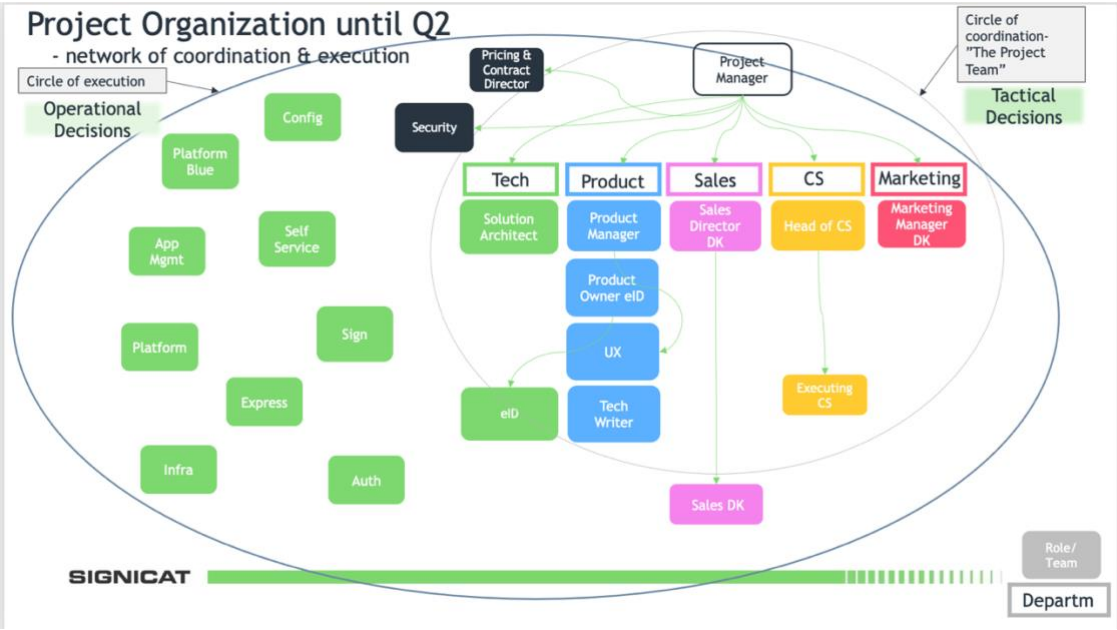
Figure 26: Project organization in MitID (Appendix 9.1.2)

MitID's project group is a clear difference from FTN where it was not the same structure. Although neither FTN nor MitID had a completely clear project methodology, the difference is that MitID had a project group that provided a certain structure in the project.

FTN ended up as a very successful project with great earnings. Whether MitID ends up just as successful is difficult to predict. The FTN success can be explained by various reasons. FTN was run by salespeople in the country in question, Finland, who had the right incentives to implement the project and make the best of it. If FTN had failed, the sales staff in Finland would probably have lost their job. Consequently, a successful project with good earnings for the company has been important.

Another difference between the projects is the complexity and the level of technical integrations (Appendix 9.1.2, question 5). Although both projects aimed to create a new and better e-ID solutions and had several similarities regarding technical terms, MitID is a more complex

project technology-wise. The implementation in FTN was smaller than in MitID. In addition, MitID has required a completely new method within e-ID with the strictest requirements ever. This has led to major changes in Signicat's platform because the entire technology should work together to change the way things are done. MitID has also a number of other features and product functionalities that FTN did not offer.

Signicat has previously been a pioneer in the e-ID market. During FTN, the market was completely different with far fewer competitors. Now there are several competitors trying to take Signicat's place in the market. This is a challenge that must be considered in the MitID project, which was not as relevant during FTN.

Summary of the two projects

None of the two projects ended up being 100% agile. In FTN, the development towards agile methods took place organically, while in MitID, Signicat tried to be agile. None of the methods were probably the ideal one for the company.

5.3.4   Agile methods in Signicat

Signicat wants to have agile approaches in their projects. However, they claim that agile methods are easier to apply to smaller projects than larger ones (Appendix 9.1.1, question 11). Kashyap (2018) confirms this scaling of projects in his comparison of agile and traditional methods as shown in Table 4. The developers in Signicat are eager to work in a more agile way. Developers often have some prior knowledge about agile methods from their studies. However, it is also becoming increasingly common for non-developers to use such methods both in working life and in school. As shown in Table 5, all the agile methods described have evolved to fit into any industry and business area.

The expertise in agile methodology in Signicat is varied. Many employees know a lot about the methodology, while others have less knowledge about it (Appendix 9.1.6, question 3). It can be hard to distinguish between ad-hoc and agile, and some will think that they are working agile if they change things ad-hoc in the process. Ad-hoc will not work when you have a customer perspective because you get no deliveries. Most people in Signicat have heard about agile methods, some have no experience but only know the theoretical aspect of agile methods. They do not know what it involves and exists of, and they forget that an individual adaptation to each

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company or project is required. One cannot copy the "Spotify model" or another method that have worked for others. A company must find its own way and version of the agile method that is adapted to them.

Signicat has several small projects in addition to the larger ones, such as FTN and MitID. It will be easier to use scrum in the smaller projects since it contains fewer people and fewer tasks. FTN had an agile development during the process but started without any specific project methodology. These are experiences that are important when the MitID project is being developed. Signicat wants this project to become more flexible. They have already prioritized resources in a better way and divided the employees involved into smaller teams with their own defined areas of responsibility.

Based on the Scrum method in the company, everything is first documented in an online solution for storing information, called Confluence. Then, a backlog is run on everything that happens and tasks are continuously re-prioritized if necessary. Every task is also broken down into smaller sprints (Appendix 9.1.1, question 8). Furthermore, the focus is on prioritizing which tasks are most important and the development team decides which tasks should be included or not. These decisions are all based on available resources and expertise and the framework is similar to the scrum method as described in Table 5.

Although one might think that Signicat has come a long way in the process of becoming an "agile company", they are still in the experimental phase of applying agile methods to their work. They have been using sprints to divide tasks for a while with the scrum method as described in Table 5. Now, however, their focus is turned towards planning and how to structure the processes to achieve the best possible results (Appendix 9.1.1, question 8). The length of the sprint has been changed from two to four weeks to check if this makes the project more predictable. Looking at the results and consequences of such a change provides knowledge and experiences for later tasks and is continuously taken into account.

The agile manifesto, which can be read more about in section 4.2.1, may be challenging for both the team and the managers. Leaders who let go of power and focus less on reporting are often unpopular, especially amongst traditional leaders (Appendix 9.1.3). This often means lower salaries and lower positions as well. Being able to change for the company's best can be difficult for employees who have been accustomed to a culture and one type of governance for

years (Appendix 9.1.2). Willingness to change is therefore required amongst employees in order to achieve an agile structure in a company such as Signicat.

There will always be differences in projects and no projects will be exactly alike. The same applies to all groups, teams and departments in the company. Everything may not be so easy to divide into smaller tasks and sprints to be completed within two weeks. There must therefore be an individual assessment of how each task and each project should be solved. Overall, the employees in Signicat have experienced that this way of thinking and working works, and that flexible and agile methods have led to many positive aspects for Signicat. This is probably methods that have come to stay in the company.

6 Discussion

This chapter lays the foundation for answering the defined research questions through discussion and interpretation of theory and analysis (Olsson, 2011). The discussion will deal with findings from the empirical data and link these to the theory from Chapter 4. The chapter is divided into three parts: one for each research question. The three research questions are pretty similar. The findings and their associated discussion may therefore have certain similarities and there will be a gradual overlap between the three.

- What are the similarities and differences between FTN and MitID?
- What are the characteristics of Signicat's agile approach?
- What can Signicat learn from MitID for future projects?

6.1 What are the similarities and differences between FTN and MitID?

Wysocki (2011) describes a project as a sequence of unique, complex and connected activities that have one purpose or goal, which must be completed within a specific time, a given budget, and according to the specification and scope. This is the traditional project description that has been used for over 100 years. The agile project methodology is newer and more customized to today's society where you have to pay attention to changes, teamwork, customer collaboration, and flexibility (Carr, 2017). Signicat's two major projects, FTN and MitID, are both a combination of the two project methodologies. Especially MitID, which is the latest project that is still under development, has been attempted to make the project implementation agile. With the Danish authorities that determine the time aspect and scope, it has been difficult to implement it 100% agile.

The two projects FTN and MitID may look similar because they produce similar solutions within digital identity. The differences and similarities found from the empirical data will be explained in more detail in this subchapter.

According to Ølnes (Appendix 9.1.1), the FTN project was a successful project performed quite ad-hoc, as there were few people involved in the work and things were done and planned along the way. In the Agile Manifesto, Cohen (2004) states that individuals and interactions should be prioritized over processes and tools, as well as responding to change should be prioritized over following a plan. Moreover, Moe (2020) claims that the customer and project participants always should be in focus. This applies to both projects where the planning of the FTN project

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was performed based on how the project developed and appropriate responses were performed as responses to any encountered problems during the process. According to the marketing department in MitID, the project has had continuous surveys with the customers to find out what they want and need, in addition to update them on the status of how things are going in the process. The customers have had an important role in both projects and was deeply involved in the decision makings done underway which is an agile characteristic as described in Table 4. Even though the FTN project did not have a formal project methodology or project manager in the initial phase, the work performed have characteristics that may resemble an agile approach. MitID has had a project manager throughout the process who has ensured that this has taken place in a proper manner.

In both projects, the tasks were divided into different sprints according to the scrum method and its cadence as described in Table 5. As the tasks were executed, the teams reflected, adjusted and improved the work done with retrospective techniques. By doing so, the customer got involved and the teams sought for the customers to be as satisfied with the delivered service as possible. In FTN, the project-work was done ad-hoc as there had not been done any similar projects before and the uncertainties were many. In MitID, there was a bit more structure and less work done ad-hoc. Planning ahead was challenging for both of the projects and the teams did not know exactly what the end-result would be, nor how to get there or what problems might arise along the way. This can be related to Boehm and Turners (2015), who states that agile project methodology is often used in uncertain projects where the beginning of a project is characterized by less knowledge than what is needed in total. Thus, it can be difficult to decide which features and specifications the customer needs. In retrospect, they should probably have learned something from FTN that could have been used in MitID, but the roles were not the same in the two projects. The project group responsible for MitID was also minimally involved in FTN, which made it difficult to use the previous experiences.

The different changes applied to the work with the FTN project are examples of agile principles and approaches. The methodology that arose during the work can be looked upon as a variation of the scrum method, as it works for both complex, innovative and more structured projects (Alliance, 2016). Scrum uses iterative, incremental and retrospective approaches to optimize predictability and control uncertainty (Sutherland and Schwaber, 2017). Accordingly, this method fits well with what is discovered in the empirical data, where the Signicat team adapts and adjusts the work along the way, as well as keeping a focus on the customers wants which

is a focus area in all of the agile methods described in Table 5. The work undertaken in the FTN-project can therefore be seen upon as an evolvement towards an agile approach. The team was involved in changing the project work, and later also Signicat's understanding on how to perform the work in the projects. This led the company towards becoming a more agile company without being aware of it. This development can be described as an organic development towards the agile methods, which is both interesting and unusual.

In MitID, the choice of method has been more conscious and since scrum and the iterative approaches worked well during FTN, it can be seen as a continuation of agile principles in the company. Scrum emphasizes the values of commitment, courage, focus, openness, and respect (Versionne, 2017). Drumond (2020) describes scrum as a set of meetings, tools, and roles that work together to help the team to structure and manage their work. This fits well with the project process in MitID, where the development department has worked in this way and has wanted to carry out the tasks in 2-week sprints, be iterative, and take one task at a time. This method has probably worked best in the development department, as Signicat has had problems transferring it to the rest of the organization with a desire for a completely scaled agile framework. The biggest challenge has been between sales and development as these are the two disciplines that are furthest apart and struggle the most to agree with each other. In addition to the fact that the management has had problems coming up with a common methodology that will apply to the entire company. According to Agilest (2021) and Piikkila (2021), the scaled agile framework is an interactive software framework that enables you to apply different agile practices, like lean and scrum, to large enterprises. Consequently, this method fits with what is discovered in the empirical data when it comes to what the future goal for Signicat is. The Tech Excellence program is a beginning on such a framework described in Table 5, but so far it has only reached team level. Following findings from the interviews, an overall decision at management level will be a positive factor on the way to a scaled agile framework to get the entire company involved in the change to become a fully scaled agile framework.

As the FTN-project grew and Signicat grew, there became a need for a methodology to structure tasks and resources better. As mentioned above, the project did not have a project manager nor a project methodology in the initial phase of the work. The employees in Signicat did not actively advocate that the methodology they needed should be of agile quality, but with natural and necessary changes within the company and the projects, it resulted in a development towards an agile approach that is now becoming a standard in the company. Although MitID

had a better structure and planning from the start with a separate project team, it was difficult to get all participating disciplines to work agile. Both of the projects had given deadlines and guidelines set by external stakeholders, which affects the possibilities of making a project 100% agile. Signicat was forced to think outside the box, but within the framework in the projects, which has led to both complexity, challenges, but also important experiences.

From Signicat's perspective, the FTN-project was considered a successful project. In retrospect, it can be difficult to determine whether a project is a success or not. For this given project Signicat increased their sales in Finland considerably with around 300 %. However, one can never know whether the project would have benefitted more from a different project implementation and execution. When it comes to MitID, the results are not available yet, as the project is not launched before August 2021. However, it still seems to be successful as many customers already have signed the deals and want to use Signicat's solution for MitID. Signicat has become a certified MitID broker, which means that they are on time in the project and ready to start production. In addition, the project participants feel included and that they are an important part of the project.

The FTN project was a project done with less structure and planning, but with a motivated and committed team. This led to a natural development towards a more agile approach. The development was not driven by the employees but happened in a more natural and organic way. MitID has many similarities to FTN when it comes to solution and technical integrations, as the projects can resemble each other when it comes to solving digital identity problems in the respective countries. The biggest difference is the different project methodologies used. MitID was carried out with a desire to perform an agile project, while FTN received an organic development towards this approach naturally. Neither of the projects ended up being 100% agile, but some of the participating departments performed their tasks within agile methods.

The employees of Signicat consider the project to be a success and are satisfied with how the project work became the starting point into a more agile approach throughout the company. MitID looks promising preliminary, but all the results are not available yet. However, the project participants feel that the project has had a lot of chaos and frustration, but it is constantly getting better.

6.2 What are the characteristics of Signicat's agile approach?

When collecting the empirical data, I learned that agile methods has been gradually introduced in Signicat's project work, especially through the FTN project. By gradually adapting to a more agile method with characteristics of the scrum method, they have managed an organic progress towards a more agile way of operating, with a more customer-oriented focus where teams adjust and adapt their work according to encountered problems. Moe (2020) claims that such a focus is the key to success when working with projects.

Ølnes (Appendix 9.1.1) claims that many of Signicat's projects is characterized by an end-result which can be difficult to predict in initial phases of the work. Often the desired end-result becomes clearer as the work progresses. Hence, essential parts of the work are the willingness to be able to change and react quickly to unexpected events or problems, as well as having a retrospective view on the project and continuously assess the work that has been done. Good collaboration within the teams, good communication and a common understanding of tasks, goals and results among the project participants are necessary. The projects in Signicat are often innovative and have never been performed before. In such cases, it is recommended with an agile approach based on the scrum method (Schwaber & Sutherland, 2017) as well as the Agile Manifesto where tasks and problems are adjusted and adapted to the process along the way (Moe, 2020). By applying these features of an agile approach, such projects will be more successful (Moe, 2020; Schwaber & Sutherland, 2017).

When working with projects, the complexity of a task will often increase exponentially with the size of the project (Myrvang and Aasen, 2018). This can make it difficult to define project requirements in advance. By applying the scrum method with sprints into their project work, Signicat breaks down the complexity of a project into smaller parts. According to Sutherland and Schwaber (2017), sprints are a central part of the scrum method. Each of the sprints used in Signicat consist of specific tasks and involves a few specific areas for the team to focus on during the given sprint. The length of the sprints can vary, but the most common length is two weeks to limit the scope. This is supported by the findings of Schartum and Sørensen (2014), who believes that agile methods enable smaller errors to be identified early in the process and allows changes to be made.

The different sprints can be seen as different mini projects. By dividing the work of a project into smaller workloads, it gets easier to handle uncertainty and correct any mistakes or errors

that is detected along the way. Sutherland and Schwaber (2017) argue that longer sprints can increase complexity and uncertainty. In Signicat we have seen that agile methods are easier to use in smaller projects rather than large ones, as the complexity increases with larger projects, which is also supported by Kashyap (2018) in Table 4. In smaller projects, the sprints will naturally be shorter and less complex than in bigger projects. However, Signicat has successfully applied an agile approach to larger projects as well. The project MitID is an example of a case where Signicat allocates most of their resources in different development teams. The development teams consist of 1-3 developers which work solely on the MitID.

Sprints can consist of both few and large tasks, as well as many smaller tasks, but it never deals with more than a few topics, as described in Table 5 about the scrum method. The amount of work necessary to complete the different tasks is estimated and calculated into different sprints. By continuously completing tasks along the way, the company will have an up-to-date schedule and status of how far along the work has gotten. This enables a better way of showing progress to the customer and that the product or service delivered matches the customer's wishes (Myrvang and Aasen, 2018). The same applies to the other central part of the scrum method; the meeting principles (Drumond, 2020; Sutherland and Schwaber, 2017). By adding both sprints and the meeting principles to the project work, you will ensure the best possible prioritization and order of the tasks to be done, as well a reflective focus whether the tasks have been successfully performed after completion.

In Signicat, the development team has tried to be as agile as possible, and they have done all the ceremonies and meetings with a scrum mindset and framework as described in Table 5. This includes sprint review meeting, sprint backlog meeting, sprint planning meeting, and daily stand-up meetings (Appendix 9.1.7). In fact, they mostly do what is described in the Scaled Agile Framework in Table 5. The difference between Signicat and a complete SAFe is that there is a framework on top of the ceremonies done in the company. The SAFe is a set of organization and workflow patterns intended to guide enterprises in scaling lean and agile practices (SAFe, 2021; Piikkila, 2021). Using the mindset, values, practices, and principles from SAFe will help to push companies into a positive development by adopting a new way of working. Signicat has a desire to move towards this framework and believes that they have the competence to manage it (Appendix 9.1.3). The only thing missing is prioritization of time, resources, and a management that is willing to implement it. Through Tech Excellence, they

have made an effort to get it into team level, but the complete SAFe is about getting the entire organization into the framework.

Signicat wants to continue the growth they have had in recent years, both in revenue and employees. Therefore, the need for a project methodology is present and the company is still in the experimental phase of applying the agile methods. They are continuously trying out new techniques, by changing the limit on sprints as well as looking back at older projects to reflect on both positive and negative experiences. By being an IT company, Signicat has a number of employees who are software developers. The scrum method has its origin in teams of software developers (Drumond, 2020). Scrum is a well-known method for many of Signicat's employees, which has made the gradual transition easier. The MitID project as a whole is more similar to a waterfall project than an agile project. Nevertheless, the e-ID team in Trondheim, who are the ones performing the development part of the project, does all the ceremonies with a scrum mindset (Appendix 9.1.7, question 8).

Moe (2020) argues that many companies believe they are agile without having a complete practice of the method. To be agile, one must adapt, adjust and improve the processes and adapt them to the problem, not just follow a given process. The software developer in Signicat, in Appendix 9.1.6, question 3, confirms Moe's arguments and believes that there is a need for a better understanding of the agile in Signicat. You are not agile if you just change your processes ad-hoc. Agile is about improving and adapting to the situation and an individual and adapted approach is necessary for each company.

Agile methods are often used in projects characterized by uncertainty. Such projects might not have all the information that is needed in the beginning. On the contrary, you will learn and develop as the work develops. This means that it might be difficult to determine which functions and specifications are needed for the project work (Boehm & Turner 2005). Like in Signicat, we can assume that many companies want a more agile approach. However, it varies whether companies want to apply such an agile approach through the entire company, or to specific departments. Wysocki (2011) believes that projects where the work and project goals are characterized by and involves uncertainty needs an alternative to traditional project methodology. Some departments, especially those that include software developers, will thus be better equipped for such a transition into a more agile approach. Other departments may have to hold back to make sure the structure is maintained and will prefer a more gradual

transition. According to the empirical data, Signicat is in the trial phase of applying agile methods. The goal is to work agile throughout the company, but the degree of completeness varies between the different departments. The uncertainty tied to some of Signicat's bigger projects, such as FTN and MitID, requires more control. In smaller projects, agile methods can be a great tool for dividing the work into smaller tasks to get the project done. Nevertheless, not all projects are easy to divide into smaller tasks and sprints.

A retrospective perspective where you are able to stop and look back at whether the processes work and whether there is progress will be crucial. Methods and practices that appear agile are not necessarily the same in every project as projects may be different. Individual adaptations to each project are therefore needed. In Signicat there is not a single solution for how to handle agile methods and no projects can be performed in the exact same way. As there are many small projects that are similar to each other, the company can use similar adaptations, e.g., in the scrum method where smaller tasks are divided into sprints. This applies to the FTN project where experiences and processes learned can be re-used in the upcoming project in Denmark, MitID. The various projects in Signicat need their own version of an agile methodology.

Turk et al. (2002) argue that the degree of agility in a development process is defined by the project team's ability to dynamically adapt to the process based on changes in the environment. Based on this, it can be assumed that a high degree of agility depends on adaptable methods and experienced developers who know how to adapt to practices effectively. Moe (2020) argues that agile practices involve the ability to adapt and fine-tune development methods as needed, as well as handle changes. It will be beneficial to have the opportunity to use different methods since each method does not cover all aspects and projects. In Signicat, different methods are used in different projects. There can also be different methods used in the same project. The team needs to reflect on how to become more effective and adjust the behavior accordingly. The core idea of agile methods is to change and adapt to changes based on your reflections (Moe, 2020).

In Signicat, there are no specific requirements for using agile methods in projects. Each project is individual and requires different adaptions and solutions. Depending on the project, it can sometimes be better with a more traditional approach rather than an agile approach. One of the disadvantages of traditional project methodology is that "one size does not fit all" (Spundak, 2014; Lea, 2018). Thus, agile methods *can* be a good solution for different projects, but it is not

always the same agile method that is best suited; whether it is scrum, Kanban, lean or another method. According to one of the product managers I have spoken with in Signicat, the company is constantly testing new methods and reviewing what worked and what did not in the different methods. In the MitID project they have used agile methodology on some parts of the project. Consequently, the project is not 100% agile, but some parts of it is.

Characteristics of projects with agile methodologies is closer customer involvement and a more customer-oriented focus to ensure satisfied end-consumers, in addition to aiming for fast deliveries for continuous improvement based on feedback related to both changes and bug fixes. Alexander (2018) claims that agile approaches are perfect for organizations that want to transform how they manage projects and functions as a whole. A more agile approach will also enable the team to deliver a better product, with a faster process leading to more satisfied customer. This is exactly what Signicat wants to achieve. The project managers from the interviews confirm that they recognize problems and experiences about agile methods in Signicat from previous jobs, which means it can be assumed that this thesis has high external reliability and the findings may be the same in similar companies and projects.

Based on the empirical data collected and the theory described in chapter 4, I have seen that agile methods are adaptable and flexible methods that can be used in different types of projects. Signicat works towards an agile approach in both individual projects as well as the company as a whole. All of the company's departments wants to be more flexible. Working agile is a good solution to achieve such flexibility. Different methods and approaches are used in different projects as an individual adaption to each project has proven to be beneficiary through the theory presented and in Signicat. Overall, agile methods play an increasingly important role in Signicat and is essential to the growth they are currently experiencing.

6.3 What can Signicat learn from MitID for future projects?

Projects that involve uncertainty and high vulnerability need a more flexible alternative than traditional project methodology (Wysocki, 2011). MitID is a good example of a project with high uncertainty as it is the Danish authorities that has decided the requirements and the timeline for the project, in addition to changing them several times along the way. Getting into agile principles will therefore be helpful as this will enable a more flexible way to work where one can quickly adapt to possible changes.

Graves (2016) and Serrano and Pinto (2015) explain that showing the customer that you have an understanding of the process, the presence, and having enough knowledge about what to develop when using agile methods, is crucial to gain the customer's trust. The way this has been drawn into MitID is the way the marketing department has communicated with the customers. In the starting phase of the project, surveys were carried out to find out what the service providers wanted and expected. Such surveys have continuously been sent to customers during the process to always be updated on customer needs. They have also had a great communication with the customers to inform them about the status of the project. This has meant that Signicat has been able to emerge as a serious and experienced broker who wants to make customers satisfied. This can also be linked to the Agile Manifesto made by Cohen (2004) which states that individuals and interactions should be prioritized over processes and tools, and customer collaboration should be prioritized over contract negotiation. It is difficult to decide which functions and specifications the customer needs and wants in an agile project (Boehm and Turner, 2005). This has been solved in MitID with the continuous dialogue with the customers and the surveys that have been made to keep them updated on the status of the project, but also for the project group to be kept up to date on what the customer wants. Having a close dialogue with customers via the marketing department with the campaigns and webinars can be compared to agile methods. It will be one of the agile levels in the company where the second level will be, in sales meetings, doing the nuanced dialogue where you can say something about what is coming. Combined with this, it will be important to be able to talk about the uncertainty.

The marketing department has also created an e-guide for the customers to get information about the project. The external communication has therefore worked well. The same applies to the internal communication, much thanks to Slack which has been used as a communication channel internally in the company. It has been easy to follow new information and updates in the project for everyone, not only for those who are involved in the project. The communication between the project group and the management in the company has not been the best.

An important factor in such a project learned is to get support from the top management. It is impossible for the project group to communicate things to the rest of the company without this support. The project tool that was created in Miro for product development of new products is an example that was not successful due to lack of support from top management. The new product development method was good, but it was not used since the top management did not

communicate that this was the new template. Therefore, communication and prioritization of resources and time has been a challenge in the project.

Having defined roles and responsibilities is amongst the most important experiences learned after the MitID project according to the product managers. Defined roles and responsibilities involve which roles should be included in the project and which responsibilities belong to each role. Scrum and SAFe require defined roles, which have not been structured well enough in the MitID project. Rangaraj (2012) believes that SAFe is a framework that contains structured guidance on roles and responsibilities, important values, and how to plan and manage work. Drumond (2020) describes scrum as a set of meetings, tools, and roles that together will help the team to structure and manage their work. Findings from the empirical data show that defined roles and responsibilities are missing in Signicat, but there is a desire for this to be improved.

The product owner for the e-ID team has learned that a project like MitID requires a good and solid preparation. One must do a proper scoping of the project and set up an appropriate project organization. It can also be beneficial to have a technical architect that has the total overview on the project, especially if stakeholders from different development teams must be involved. In MitID, the collaboration between the departments involved has been poor, which has created chaos and frustration internally. Based on project theory, scoping of a project is an important part of both traditional and agile methodology. Traditional project managers focus on upfront planning where factors like cost, scope and time are given great importance (Carr, 2017; Cobb, 2011). Agile project managers give prominence to teamwork, customer collaboration, customer success and flexibility. A project such as MitID, which ends up with a hybrid variant of the project methodologies, will therefore require a bit from both the traditional and the agile framework. In MitID, the Danish authorities determined scope, framework, and deadlines. Scoping a project is challenging when you lack information and have high uncertainty.

Signicat has learned that the project organization and the project group must collaborate and be structured. The MitID project has taught them that there is a need for a project methodology. Signicat will remember the positive experiences with the close follow-up of customers and service providers. For similar projects in the future, experiences from the process and teamwork will be used, combined with clarification of scope, roles and responsibilities from the start. If you do not define this well enough, friction will occur in the team and the rest of the organization that will create more negative effects than positive. A good advice for such

projects will therefore be to involve and inform the required parties early. This applies to stakeholders, customers or project participants. By taking into account the uncertainty in the project, you create trust and show that you take the project seriously.

Summary of the most important learnings for upcoming projects:
- A thorough clarification of scope, roles, and responsibilities from the start is helpful.
- The project organization and the project group must collaborate and be structured.
- To get support from the top management to communicate things to the rest of the company.
- Have a good communication and close follow-up of the customers. The MitID project contained surveys, webinars, and marketing campaigns.
- The required parties should be involved and informed early in the process. This applies to stakeholders, customers, or project participants.

6.4 Summary of discussion

Agile methods are a growing trend in several industries and companies. In an increasingly complex world, adaptation and change are needed to keep up. Agile methods are adaptable and flexible methods to use in different types of projects. FTN was a project characterized by a lack of structure and planning, but the project ended up as an introduction to an agile approach in Signicat. The whole organization is now trying to carry out projects with an agile approach. MitID was planned to be performed with agile methods, although this did not succeed 100%. Signicat has realized that agile methods are future-oriented and adaptable methods that can increase the quality of their projects. With the experiments made on performing projects with an agile mindset Signicat is constantly improving on dealing with such situation and projects. The firm wants to develop towards a scaled agile framework, and with the right prioritization, that seems to be a realistic goal for the coming years.

7 Conclusion

This thesis has mapped out characteristics of the project methodology in Signicat with an analysis of differences and similarities in the two selected projects, FTN and MitID, combined with a description of characteristics of agile methods in general. The most common agile methods are compared to clarify why and how such methods are used in Signicat. This chapter will summarize the findings, based on the following defined research questions:

- What are the similarities and differences between FTN and MitID?
- What are the characteristics of Signicat's agile approach?
- What can Signicat learn from MitID for future projects?

The conclusion is formulated on the basis of a theoretical basis from a literature study, as well as empirical research carried out in connection with the thesis.

7.1 What are the similarities and differences between FTN and MitID?

The FTN project was done with less structure and planning, but with a motivated and committed team. This led to a natural development towards a more agile approach. MitID was carried out with a desire to perform an agile project, while FTN received an organic development towards this approach. None of the projects ended up being 100% agile, but some of the participating departments performed their tasks within agile methods. The development team in both of the projects, which has tried to work agile with scrum is a similarity between the two projects.

7.2 What are the characteristics of Signicat's agile approach?

Signicat works towards an agile approach in both individual projects as well as the company as a whole. Different methods and approaches are used in different projects as an individual adaption to each project has proven to be beneficiary both through the theory presented in chapter 4 and as experienced by the employees of Signicat. The employees are satisfied with the development they have made towards becoming a more agile company. The company has experienced tremendous growth during the recent years and their business is not suffering from the ongoing pandemic of COVID-19. An agile approach can be assumed to be a crucial factor in this process and necessary for their remarkable growth. The need for digitalization has never been greater and more companies understand the need for their services and products. Signicat is a living proof of this.

7.3 What can Signicat learn from MitID for future projects?

Both FTN and MitID have been important and educational projects for Signicat. After MitID, they understood the importance of having a functioning and well-organized project group that makes a thorough scoping of the project in the starting phase, in addition to having defined roles and responsibilities. In order to get a project team to cooperate in the best possible way with the rest of the organization, the communication within the company will also be an important factor. Having support from the top management team (TMT) will therefore be important for getting the rest of the organization to understand the importance of the project and respect that it is prioritized. Nevertheless, the most important factor will be the customer focus. The close follow-up of customers will therefore be the most crucial factor for success.

7.4 Further work

This study has focused on agile methods in general and how the two projects, FTN and MitID, in Signicat were performed. The research questions set the framework for the thesis, but there are many other areas concerning agile methods that could have been interesting to investigate further.

Examples of such areas of interest are:

- For the future aspect, see how the COVID-19 pandemic has affected Signicat and more specific regarding the changes in project work when the pandemic is over.

- To investigate whether the long-standing employees of Signicat has noticed the change and development the company is a part of.

- To test the findings from the study against other projects than only FTN and MitID. This will be able to show the effect the establishment of agile methods has had by compare the results from a new project with the results from the projects.

- To investigate further how the rest of the management perceives the implementation of agile methods compared to the project participants.

- To look into the balance between formalized structure and coordination on top in the company versus flexibility and distribution of decisions for larger projects, and for Signicat's normal business operations.

A natural extension of a theoretical approach as presented in this thesis can be a case study where methods, principles and characteristics of agile methods are further researched. This

analysis addresses three agile methods and explain these in more detail, but there are still several other methods that can be argued that should have been included instead. The given methods have been chosen as they are seen relevant for the case company, Signicat.

8 Reference List

- Allysky (2020) *Lean Portfolio Management.* Retrieved from: https://allysky.com/leanportfoliomanagementv4.html (17.02.2021)

- Agilest (2021) *Scaling Agile with SAFe (Scaled Agile Framework)* Retrieved from: https://www.agilest.org/scaled-agile/safe-framework/ (09.02.2021)

- Alexander M. (2018) *Agile project management: 12 key principles, 4 big hurdles*

- Alliance S. (2016) *Learn about Scrum. Scrum Alliance.*

- Aveson D. and Fitzgerald G. (2006) *Methodologies for Developing Information Systems: A Historical Perspective.* Volume 214.

- Banerjee S. (2016) *Role of a Project Manager in Managing Agile Projects*

- Boehm B. and Turner R. (2004) *Balancing agility and discipline: evaluating and integrating agile and plan-driven methods.*

- Boehm B. and Turner R. (2005) *Management challenges to implementing agile processes in traditional development organizations.*

- Bryman A. (2012) *Social Research Methods.* 5th edition. Oxford: Oxford University Press

- Byberg I. (2019) *Implementation of Agile Methods in the Payroll Department of the Norwegian Government Agency for Financial Management.* Master thesis. Universitetet i Stavanger.

- Carr K. (2017) *Agile Project Management Vs. Traditional Project Management*

- Cobb C. G. (2011) *Making Sense of Agile Project Management: Balancing Control and Agility*

- Cohen D. (2004) *An Introduction to Agile Methods*

- Cohn M. (2020) *User Stories and User Story Examples*

- Dalen M. (2008) *Validitet og reliabilitet i kvalitativ forskning.* UiO.

- Dalen, M. (2004) *Intervju som forskningsmetode.* Oslo: Universitetsforlaget.

- De nasjonale forskningsetiske komiteene (2016) *Beskyttelse av forskningsdeltagere.* Retrieved from: https://www.etikkom.no/forskningsetiske-retningslinjer/naturvitenskap-og- teknologi/beskyttelse-av-forskningsdeltakere/ (25.03.2021)

- Diaz A. A. (2019) *What is SAFe5.0 all about)* Retrieved from: https://netmind.net/what-is-safe-5-0-all-about/ (11.02.2021)

- Digité (2020) *What is Kanban?* Retrieved from:

    https://www.digite.com/kanban/what-is-kanban/#kanban-method (13.11.2020)

- Dingsøyr T. Falessi D. Power K (2019) *Agile Development at Sclae: The Next*

    Frontier. Retrieved from:

    https://ieeexplore.ieee.org/ielx7/52/8648250/08648272.pdf?tag=1&tag=1

    (13.11.2020)

- Drumond C. (2020) *Scrum – what is it, how it works, and why it's awesome*

- Dpm, Digital Project Manager (2018) *How to Run a Sprint Retrospective That*

    Actually Leads to Change. Retrieved from:

    https://medium.com/@thedigitalpm/how-to-run-a-sprint-retrospective-that-
    actually-leads-to-change-6e804570aef5 (13.11.2020)

- Fogarty K. (2001) *Technical Agility.* Retrieved from:

    https://www.computerworld.com/article/2582993/technical-agility.html

    (18.02.2021)

- Fowler M. and Highsmith J. (2001) *The Agile Manifesto*

- FTN (2017) *Finnish Trusted Network Information (English Translation).* Retrieved

    from: https://developer.signicat.com/documentation/finnish-trust-

    network/finnish-trust-network-information-english-translation/ (13.11.2020)

- Garel G. (2013) *Ahistory of project management models: From pre-models to the*

    standard models. Volume 31

- Graves E. (2016) *Agile Principle 1: Early and Continuous Delivery of Value*

- Hansen M. Ølnes J. Kristensen L. M. (2020) *NemID → MitID*. Internal webinar

    January 30th, 2020

- Highsmith J. (2009) *Agile Project Management*

- Highsmith J. (2001) *The Agile Manifesto*. Retrieved from: https://agilemanifesto.org

    (28.10.2020)

- Hines P. Holweg M. and Rich N (2004) *Learning to evolve: A review of contemporary*

    lean thinking

- Holme, I. M. and Solvang, B. K. (1996) *Metodevalg og metodebruk.* Otta: Tano.

- Huether D. (2017) *Agile Practices, Definition of Done*

- Jacobsen D. I. (2015) *Forskningsopplegg og metoder. Hvordan gjennomføre*

    undersøkelser? Retrieved from:

    https://www.uio.no/studier/emner/jus/afin/FINF4002/v14/metode1.pdf

    (11.11.2020)

- Johannessen A, Tufte P. A. and Christoffersen L (2016) *Introduksjon til samfunnsvitenskapelig metode* 5th edition, Oslo: Abstrakt forlag

- Chiva G. (2020) *Kanban Practices.* Retrieved from:
  https://aktiasolutions.com/kanban-practices/ (23.03.2021)

- Kanban University (2020) *What is the Kanban Method?* Retrieved from:
  https://kanban.university/#certifiedkanban (13.11.2020)

- Kashyap S. (2018) *Traditional vs Agile Project Management Method: Which One is Right for Your Project?*

- Knaster R. and Leffingwell D. (2020) *Agile Product Delivery*. Retrieved from:
  https://www.informit.com/articles/article.aspx?p=3089303&seqNum=3 (18.02.2021)

- Küsters M. (2016) *Lean-Agile Leadership: The six responsibilities of management.* Retrieved from: https://www.linkedin.com/pulse/lean-agile-leadership-six-responsibilities-management-michael-küsters/ (18.02.2021)

- Lea W. (2018) *A guide to AgileSHIFT* 1st edition. Norwich, UK: The Stationary Office.

- Lean Enterprise (2009) *A brief history of lean.*

- Matos S. and Lopes E (2013) *PRINCE2 or PMBOK- a question of choice*

- May J. (2021) *Lean Portfolio Management.* Retrieved from:
  https://www.atlassian.com/agile/agile-at-scale/lean-portfolio-management (18.02.2021)

- McInerney P, and Maurer F (2005) *UCS in agile projects: dream team or odd couple?*

- Moe N. B. Guest lecture in Agile methods in IT, 2020.

- Myrvang V. and Aasen A. E (2018) *Approaches to agile methods for software development in Telenor*. Master thesis. HIST Handelshøyskolen i Trondheim.

- Pawar Y. (2017) *What is the difference between Traditional and Agile Project Management*

- Piikkila J. (2021) *What is SAFe?* Retrieved from:
  https://www.atlassian.com/agile/agile-at-scale/what-is-safe (09.02.2021)

- Poppendieck M. and Poppendieck T (2003). *Lean Software Development: An Agile Toolkit*

- Olsson N. O. E. (2011) *Praktisk rapportskriving.* 1st edition. Trondheim: Tapir akademisk forlag

- Radigan D. (2020) *What is Kanban?* Retrieved from:

    https://www.atlassian.com/agile/kanban (13.11.2020)

- Rangaraj J. (2021) *SAFe Methodology Tutorial: What is Scaled Agile Framework?*

    Retrieved from: https://www.guru99.com/scaled-agile-framework.html

    (11.02.2021)

- Rigby D. K., Sutherland J. and Noble A. (2018) *Agile at Scale*. Retrieved from:

    https://hbr.org/2018/05/agile-at-scale (18.02.2021)

- SAFe (2021) *Scaled Agile Framework.* Retrieved from:

    https://www.scaledagileframework.com/# (08.02.2021)

- Saunders (2019) *Analusis of Saunders Research Onion* Retrieved from:

    https://thesismind.com/analysis-of-saunders-research-onion/ (09.11.2020)

- Saunders, M. Lewis P. and Thorhill A. (2007) *Research Methods for Business*

    Students. 6th edition. London: Pearson

- Schartum D. W. and Sørensen D. (2014) *CompLex*

- Schwaber K. and Sutherland J. (2011) *The Scrum Papers: Nut, Bolts, and Origins of*

    an Agile Framework

- Schwaber K. and Sutherland J. (2017) *The Scrum Guide, The Definitive Guide to*

    Scrum: The Rules of the Game.

- Scrum a (2020) *The Scrum Framework Poster.* Retrieved from:

    https://www.scrum.org/resources/scrum-framework-poster (13.11.2020)

- Scrum b (2020) *Scrum*. Retrieved from:

    https://www.smartsheet.com/contentcenter/best-practices/project-

    management/project-management-guide/scrum-methodology (13.11.2020)

- Serrano P. and Pinto J. K. (2015) *Does Agile work? – a quantitative analysis of agile*

    project success.

- Signicat (2021a) *MitID.* Retrieved from:

    https://developer.signicat.com/enterprise/identity-methods/mitid/ (08.03.2021)

- Signicat (2021b) *Migration from NemID to MitID.* Retrieved from

    https://developer.signicat.com/enterprise/identity-

    methods/mitid/migration.html#migration-process-overview (10.03.2021)

- Signicat (2020) *Signicat Developer*. Retrieved from: https://developer.signicat.com

    (13.11.2020)

- Signicat (2017) *Authentication*. Retrieved from:

    https://developer.signicat.com/doc/authentication/ (13.11.2020)

- Sliger M. (2011) *Agile project management with Scrum*
- Spundak M. (2014) *Mixed Agile/traditional project management methodology – reality or illusion?*
- Stigen L. S. (2010) *Lean Construction på anleggsprosjekter.* Bachelor Thesis. Høgskolen i Gjøvik.
- The McKinsey Podcast (2020) *The journey to agile*. Retrieved from: https://link.tospotify.com/S4XliSbckbb (10.11.2020)
- Titze L. (2020) *How is an agile approach to project planning different than a traditional approach?*
- Tjora A (2017) *Kvalitative forskningsmetoder i praksis.* 3rd edition. Oslo: Gyldendal Akademisk.
- Turk D. France R and Rumpe B (2002) *Limitations of agile software processes*
- Versionone (2017) *11th Annual state of Agile report* Version one. Retrieved from: http://www.agile247.pl/wp-content/uploads/2017/04/versionone-11th-annual-state-of-agile-report.pdf (27.10.2020)
- Vinekar V., Slinkman C. W., og Nerur S. (2006). *Can Agile and Traditional Systems Development Approaches Coexist? An ambidextrous View.*
- Will B (2017) *Definition of Ready (DoR) vs. Definition of Done (DoD)* Retrieved from: https://www.linkedin.com/pulse/definition-ready-dor-vs-done-dod-brian-will/ (22.10.2020)
- Williams T (2005) *Assessing and moving on from the dominant project management discourse in the light of project overruns*
- Wysocki, R. K (2011) *Effective Project Management: Traditional, Agile, Extreme*
- Yin R. K (2014) *Case Study Research, Design and Methods*. 5th edition. SAGE.
- Ølnes J. and Seres L S. (2020) *#0364: Cybersec: Jon Ølnes: e-ID*. Retrieved from: https://www.lorn.tech/lorn-pod/364-fin-tech-jon-olnes-e-ID?hsLang=no (22.09.2020)

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Agile Methods in Signicat

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