Agile Software Development – the challenge of business client engagement in agile activities

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# Title of thesis:
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## Abstract:
It has been found that when bringing agile practices to a traditional organisation the exploitation of agile practices and culture does not reach its full potential. Agile software development requires client engagement which in many cases has been found to be insufficient in agile software development projects. This thesis studies what type of problems software suppliers face when they develop software for a client organisation and attempt to establish an agile culture in a project. The secondary aim of the thesis is to provide solutions for the experienced problems and discuss how the agile methodology could be introduced to organisations.

The methodological choice for this thesis is to conduct an explorative qualitative study with an inductive stance. The data for this study was collected by interviewing experienced software professionals between February and April 2015. The interviews were based on the following themes: the interviewees’ background in the topic, experienced problems in client engagement and activities that improve the client engagement in agile software development projects.

The findings of the study indicate that suppliers find that problems such as insufficient knowledge of business needs, power distribution in organisations, availability of the client, and organisational expectations, approach and attitudes affect the agile practices in an agile software development projects and that suppliers use activities such as e.g. using business experts, fast validation of needs, scheduling and demonstration to counteract and prevent the problems. The study shows that problems have been tackled and suppliers actively try to promote the agile culture in client organisations. However, it is evident that there is a demand for a greater visibility of the agile methodology that would be targeted to business audience in organisations.

**Key terms:** Agile software development, agile practices, client engagement.
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KEY TERMS AND DEFINITIONS

The purpose of the following definitions is to clarify different key terms that are used in this thesis. The definitions are mainly based on available literature, but the definitions for key terms such as customer attitude explain the content of the key term solely in this thesis.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td><strong>Agile software development</strong></td>
<td>An approach to software development that promotes close collaboration between the developers and business clients, speedy development and delivery of software and shared knowledge in self-organising teams.</td>
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<tr>
<td><strong>Client</strong></td>
<td>The business client who orders the software from the software supplier for business purposes.</td>
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<tr>
<td><strong>Customer focused approach</strong></td>
<td>An approach where an organisation focuses to serve its clients’ needs.</td>
</tr>
<tr>
<td><strong>Scaled agile framework</strong></td>
<td>A framework that promotes the use of lean and agile practices at enterprise scale.</td>
</tr>
<tr>
<td><strong>The agile approach</strong></td>
<td>see Agile software development.</td>
</tr>
<tr>
<td><strong>The agile manifesto</strong></td>
<td>A manifest emphasising values that promote items important in software development.</td>
</tr>
<tr>
<td><strong>The Agile methodology</strong></td>
<td>An agile framework for development projects that originally was designed for software development to respond to unpredictability in projects.</td>
</tr>
<tr>
<td><strong>The client representative</strong></td>
<td>The person/persons or the assigned product owner in the organisation who functions as a first line contact for the supplier in development enquiries.</td>
</tr>
<tr>
<td><strong>Waterfall life cycle</strong></td>
<td>A software development method that focuses on sequential process of specifying requirements and functions, designing and coding and testing.</td>
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1 INTRODUCTION

1.1. Background

The rapid development of technology has shifted software developers’ focus from building accurately functioning entities to building systems that spur organisations’ business processes. The dominant feature of information system projects today is to create systems in a fast, flexible and efficient manner in order to realise the economic benefits of the system, react to the continuous technological evolution and the user requirement changes (Boschetti et al., 2014). To achieve the required efficiency, methods and management techniques that support the dominant characteristics of today’s software development have been created by experienced software practitioners. The methods that has been said to support the current nature of software development are the so-called agile methods that together have formed the concept of agile methodology. The agile methodology highlights the collaboration between the software development team and business clients, encourages to face-to-face communication between project stakeholders, strives to recurring delivery of software to maximise business value and functions through self-organizing teams (Agile Alliance, 2015a). Whilst the agile methodology is criticised by some researchers, others believe that its characteristics hold the key to software development project success (Boehm and Turner, 2003).

The research regarding the agile methodology as well as agile methods and their effect on software system success has received considerable attention since the introduction of the concept of agile software development in 2001. Today, most software companies around the world are familiar with agile methods and choose to apply them in various software development projects. According to the State of Agile survey (VersionOne 2013) 88 % of software community representatives in the U.S. and Europe recognised agile development practices in their organisation in 2013. The corresponding percentage for 2012 was 84 % and 2011 80 %. Additionally, 53 % of the organisations had been applying agile methods in software projects between two and five years and 19 % had exceeded five years of use. These observations show that agile software development has clearly established its existence and promoted its practices and values through agile methods in today’s continuously developing business environment.

The agile approach has become well-liked during the past ten years and is a good example of how methods of developing software have changed and evolved throughout
the history of computerisation and software development. Figure 1 (on page 2) describes the history of computerisation and the type of business incentives which have spurred the emergence of different software development approaches. The figure shows that the agile approach is recognised and used in the 2000s; however, other methods mentioned in the figure are also exploited in software development to this day.

Table 1  A timeline for incentives for software development and discovery of software development methods (Friedman and Cornford, 1993; Laanti, 2008; Petter et al., 2012; Tomayko and Hazzan, 2004)

<table>
<thead>
<tr>
<th>Incentive</th>
<th>Method</th>
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<tbody>
<tr>
<td>• Data processing • Technical accuracy for calculations</td>
<td>Abstraction &amp; subroutines</td>
</tr>
<tr>
<td>• Technological change • Improving cost/performance ratios • Increased complexity → integration of systems</td>
<td>'Waterfall life cycle': Specifying → Designing → Coding → Testing</td>
</tr>
<tr>
<td>• User interaction with computers • ability to improve decision-making • Organisational efficiency</td>
<td>'The iterative development model &amp; the spiral software development model'</td>
</tr>
<tr>
<td>• User-developer interaction → customer-focus on requirements • Efficiency and competitive advantage</td>
<td>'The agile methodology'</td>
</tr>
<tr>
<td>• Organisational complexity • Stakeholder interaction • Efficiency and competitive advantage</td>
<td>'Lean' &amp; 'scaled agile framework'</td>
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The earliest signs of development methods could be seen from the 50s and the 60s when developers found that abstraction techniques were needed in order to refine programs and reduce their complexity (Tomayko and Hazzan, 2004: 130) At this time it was mainly the military and financial businesses who exploited computer technology and their requirements such as, quality and volume criteria for calculations drove the development (Petter et al., 2012).

As the technology evolved and computers became available for businesses, software projects started to grow in size. Applications grew more complex and many projects were struggling against time that was spent to activities such as, debugging and testing, and cost that was continuously on the increase (Friedman and Cornford, 1993: 109). It was suggested that the underlying problems could be impeded by applying a software development methodology called the waterfall life cycle. The waterfall methodology focuses on activities such as specifying, designing, coding and testing (Tomayko and Hazzan, 2004: 131). It also emphasises the importance of thorough planning and the
documentation of processes (Boehm, 2002). In the 80s when businesses strived to organisational efficiency through software systems, requirements such as the speed in development grew in importance (Petter et al., 2012). The waterfall methodology was still used; however, the methodology was modified into variants such as the iterative development model and the spiral software development model to reflect the need for speed in software development (Tomayko and Hazzan, 2004: 135-136).

As information systems in businesses became common, the development shifted towards a customer focused approach. Businesses started to invest in customisable software that could provide strategic value for the business and be modified to support individual business processes (Petter et al., 2012). For the waterfall methodology customisation of software imposed limitations and alternative lightweight approaches, such as scrum (Schwaber and Sutherland, 1995) and extreme programming (Beck, 1999), that could respond to changes in a timely manner were created. Later on the various lightweight methods helped in creating the framework for the agile methodology when software practitioners decided to gather together to see if there were any mutual characteristics that the methods shared (Cockburn, 2002: 215). In contrast to the waterfall methodologies, the agile methodology approach encouraged the development projects to be carried out through learning and responding with the stakeholder requirements as well as establishing relationships with the stakeholders (Koch, 2004: 16-17). Although the agile approach has become popular in the area of software development it is still relatively unknown on other business areas.

In fact, it has recently been discussed that the agile approach should be implemented on the enterprise level rather than only in software development teams and the closest stakeholders (Laanti et al., 2008; Abrahamsson et al., 2009). The need to implement the agile approach in organisation has also been acknowledged in practice and some models that scale agile practices, such as the scaled agile framework (Dean Leffingwell, 2011), has been suggested. Other research topics regarding the agile approach has varied from adaptation and implementation of agile to balancing traditional plan-driven methods against the agile methods (A decade of… 2012). However, it has been suggested that the future research in agile practices should be targeted at actual challenges that the continuously changing business environment sets for the agile approach, such as the recently mentioned challenge of scaling agile practices in organisations (Abrahamsson et al., 2009; Dybå and Dingsøyr, 2008).
The agile approach has intrigued some organisations even outside the software industry, mostly because of its flexibility and ability for rapid response; nevertheless most organisations are still focusing on the traditional paradigm of organising and completing a project or a task similar to the waterfall approach. It has been found that when bringing agile practices to a traditional organisation the exploitation of agile practices and culture does not reach its full potential. According to Waardenburg and Vliet (2013) this phenomenon may lead to practical problems in software development such as, insufficient requirement gathering and prioritisation, inability to react to change and the inefficient feedback which is categorised as lack of business client involvement in their work. Evidence of this separation in organisational approaches is provided in the recently published State of Agile-survey (Version One, 2015) which states that agile projects fail because of the lack of experience in agile methods, the incongruities between company culture and agile values, and because of lack of management support. In order to evade the challenges in adopting and exploiting the agile methodology in software projects some researchers suggest that the agile methodology should be tailored to fit the environmental conditions of the project (Lindvall et al. 2004; Boehm and Turner, 2005; Waardenburg and Vliet 2013).

Boehm and Turner (2005) suggest that the practical environmental project conditions are such as the skill level of developers, the collaboration skills of customer representatives and the project culture and expectations. Similar findings have been suggested by Waardenburg and Vliet (2013) who discuss in their paper that centralised IT departments and traditional project organisations can affect the adoption and exploitation of the agile approach. E.g. decisions that affect the project budget are made by IT management rather than business experts.

The author of this thesis shares the view regarding the possible environmental limitations to agile software development projects. However, the author also believes that the current phenomenon that organisations partner up with expert organisations could change the environmental conditions of a project. Kertzner (2009: 346) mentions that it has become evident that organisations today strive for rapid market response by partnering with expert organisations to accelerate certain organisational core business processes. However it has also been claimed that these co-operational approaches may place challenges to communication, control and trust across the project teams and members (Ramesh et al., 2006). These claims drew the author’s attention to study the environmental conditions a business client-supplier relationship may place on software
development projects. Furthermore the authors own interest in the agile approach and the previous research regarding challenges of agile software development lead the author to the topic of this thesis.

As it was expressed in the previous section the agile approach can be exposed to many environmental conditions created by the different project settings. The recently studied conditions that have spurred the discussion regarding the performance of agile methods are the implementation and scaling agile to organisations. Jeff Gothelf notes in his article (HBR, 2014) that all businesses are software businesses today since all organisations need to use software to manage the activities in the company. The author of this thesis believes that Jeff Gothelf is on the right path recommending organisations to shift to agile organisation practices; however, it would be beneficial to be able to address the possible problems the agile methodology faces at the moment in order to develop the concept forward. The problems have been studied to a certain extent, but any concrete coping mechanisms used in practice have not been provided in research.

Therefore the author has decided to find out how software suppliers handle the problems they face in development. A suitable starting point for the research is found to be the challenge of business client engagement in agile activities since it has been reported in several studies (Waardenburd and Vliet, 2013; Hoda et al., 2011; Ramesh et al., 2006).

The author of this thesis has her own presumptions regarding how the concept of agile methodology should be developed or applied to businesses outside the software business. The author believes that in order to improve the implementation of agile in business organisations the visibility of the concept of the agile methodology should be increased by discussing how knowledge regarding agile software development could be applied to organisations and other businesses. This assumption will be discussed on a wider scale in the fifth chapter if similar thoughts have been expressed in the empirical part of this thesis.

### 1.2. The purpose of the study

This thesis aims to discuss two themes. First, the challenge of business client engagement in agile activities will be discussed. The author will describe the problems and issues that are witnessed in practice in agile software development projects and discuss the situations and conditions that are believed to create problems. Second, the
identified problems and issues will be observed and possible activities or techniques that could counteract or solve the problems will be discussed.

Since the current phenomenon is that businesses invest in software solutions developed by an expert company the author has decided to conduct the research in an environment that constitutes from a business client and a software vendor supplier.

Numerous researches have mentioned the challenge of business client engagement in agile activities and therefore the author of this thesis has come to study the following research questions:

**RQ1:** What type of problems and issues occur in software development when the business client does not engage in the agile approach and activities recommended by the supplier?

**RQ2:** How can suppliers increase the business client’s knowledge and engagement in agile practices?

The thesis is targeted to contribute to the field of agile software development research and also, the business field of practical software development. The theoretical part of the thesis addresses the challenge of interpreting agility, introduces what type of involvement different agile methods demand from the business client, and also discusses previously witnessed problems originated from the lack of business involvement in agile software development projects. The writer hopes that the theoretical part of the thesis would encourage software development researchers to study how the visibility of the agile approach could be increased for business clients. For practical field the writer hopes that the theoretical part would increase the understanding of the agile methodology and the positive effects it has towards communication and collaboration. This contribution is targeted especially for business clients investing in software.

The empirical part of the study provides knowledge on current issues regarding client involvement in agile practices and suggestions on how the issues could be prevented or solved. The contributions of the empirical part are targeted for software suppliers and the writer hopes that they would inspire software suppliers to find practices that would increase the engagement of their business clients.
For the research field the empirical part provides information on the current and the possible future state of customer participation in software projects. Also the empirical part offers an interpretation on how problems originated from the challenge of client engagement can affect the agile principles and the agile culture from realising.

1.3. Limitations

Agility can be interpreted from different viewpoints and defined in several ways. In this thesis the writer does not attempt to define agility nor try to improve or change the concept of agile software development, instead her goal is to increase the knowledge of researchers and practitioners regarding the current issues in applying the agile methodology, moreover the issues that the current business environment places on the agile methodology and provide suggestions of how the issues could be overcome.

The writer will focus on the agile methodology and its’ supporting principles as the factors that enable an agile culture in a software development project. Creating an agile culture in a software development project may suffer from various reasons; however in this thesis only the problems and issues regarding the lack of business client involvement in agile practices and their implications on the agile methodology are studied.

Although the term “agility” is nowadays used in businesses outside the software business field, in this thesis we focus only on the business of software development. The knowledge regarding how the agile activities are performed in practice may only be collected from experienced practitioners and the study is limited only to cover the developer perspective of how customer activities may limit the related principles of agile methodology. The customer perspective is not approached in this study since the study requires experienced knowledge in the agile methodology and suitable candidates for the study would be difficult to find.

The literature reviewed in this study mainly contains articles and books that discuss agile software development. Although software projects are also highly dependent on successful project management, in this thesis, literature regarding software project management is kept on minimum. The study is limited to study the agile approach in software development projects and the lack of client involvement in agile activities, which is not commonly discussed in project management literature.
The overall purpose of this thesis is to increase business people’s knowledge in the field of agile software development and inspire researchers to study phenomena that may limit the agile culture.

1.4. **The structure of the study**

The remainder of the paper is divided into five sections. After presenting the purpose of the study and the limitations, the author will move on to discussing previous research and literature regarding the research topic. First, the author will provide a short introduction to the concept of the agile approach by presenting the agile methodology and the values and principles it is based on. Thereafter, the author will present two agile software development methods to increase the understanding in the type of activities agile methods require from the business client and how they can be set up. The second chapter will end in a discussion regarding problems in client engagement that have been identified in previous research.

The third chapter presents the methodology for the empirical study performed for the thesis. The author will discuss the nature of the study and the research design as well as the data collection and analysis techniques she has used for the study.

In the fourth chapter the author will perform the analysis that aims to answer the research questions of the study. The study is conducted in software companies in Finland and therefore the analysis observes the experiences of Finnish agile software development professionals. First the author finds out what type of problems caused by the challenge of business client engagement are experienced in agile software development projects and after that the author focuses on how the problems are solved. The analysis is performed on both of the themes and the results are presented accordingly.

In the fifth chapter the results of the empirical study will be discussed and practical implications will be presented. The author discusses the results of the study and the similarities and differences with previous studies. The author also discusses the current state of agile software development and client engagement in Finland and reports actions that could increase the overall value gained from agility. In the final chapter the conclusions of the study will be discussed and further research suggestions are presented.
2 THE CURRENT STATE OF RESEARCH

In this chapter agile software development, agile principles and the agile culture that is created by applying the mentioned concepts will be presented. The first part focuses on explaining the content of the agile approach, the agile manifesto, and the agile values and principles behind it. The author feels that for the purpose of this study it is important to understand the culture behind agility and what the implementation of the culture in software development projects requires from the different stakeholders, especially the business client. After presenting the agile culture and the agile principles the author discusses two agile software development methods, scrum and extreme programming. These methods assisted in creating the agile approach and are still used in many development projects. This part aims to increase the readers’ knowledge on how the agile culture is achieved in practice and what it requires from the business client. The fourth part of this chapter focuses on discussing previous research regarding the challenge of client engagement in agile practices and presents limitations and problems that have been identified in previous research.

2.1 Agile software development

The concept of agile software development in 2001 was initiated by 17 software professionals who agreed that an alternative approach in addition to traditional plan-driven approaches should be established through examining the similarities of various light methodologies (Koch, 2004: 225; Cockburn, 2002: 215). Activities, such as binding contracts with precisely defined project demands, providing detailed documentation of customer needs and the development process with fixed development plans, placed constraints on the development processes and often led to unexpected costs or termination of development projects (Rico et al., 2009: 7-9; Koch 2004: 15-17; Schwaber et al., 2012: 9). The alternative approach that would respond to the needs of the software development industry was released through ‘the agile manifesto’ and was built on four values and twelve principles that would promote the success of future software development (Koch 2004: 3-4).

Agility is often defined through the agile manifesto (figure 1) as well as the agile principles (Laanti et al., 2013). It has been described as an attitude, being effective and manoeuvrable, enabling change and feedback and enabling faster and nimble development (Cockburn, 2002: 178; Schuh, 2004: 2; Abrahamsson et al. 2002: 9).
The principles that form the foundation for the agile methodology today are described as follows:

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

(Agile Manifesto 2001)
The descriptions and the agile principles above sound fairly straightforward, however; there has been some critical discussion concerning the overall approach towards the agile principles and agility, and if the concept of agility should be interpreted and realised in software development projects in a unambiguous manner in order to improve the understanding of the methodology.

For example, Ambler (2002) discusses that the principles are the foundation for a successful software development way-of-thinking and that with an agile ‘state-of mind’ the efforts for developing software become more plausible. Patton (2009) adds to Ambler’s view by summarising that agile is not only an approach or a way-of-thinking, but also it forms a new culture behind the agile processes that increases the odds for the software development project to succeed. Such interpretations merely touch the surface of what is meant by agility and do not contain a clear definition of what agile actually constitutes from and what is required for agility to realise in a software development project.

Attempts of defining agility have proven to be challenging. Lyytinen and Rose (2006) claim that the lack of a clear definition for agility is one of the conceptual problems the agile methodology suffers from. They continue that the numerous agile methods created and claimed to be based on the agile methodology interpret agility through different perspectives which leads to poor understanding of the methodology in its entirety. The distinction between the agile methodology and agile methods should be emphasised when explaining agility, since the agile methods weight the importance of the different agile principles unequally and may even ignore some of them (Conboy and Fitzgerald, 2004). Instead of defining agile in unambiguous terms it may be more useful for the practice to accept the different interpretations. Laanti et al. (2013) suggest that instead of trying to define agility we should concentrate on discussing agility in practical terms and the benefits that different agile practices have on the practical project environment. This type of view may improve the understanding of how agility emerges in practice and why agility may be understood in different ways.

Based on the discussion above the author concludes that agile software development cannot be defined solely by referring to the agile values or principles. The different interpretations of practitioners, agile methods and the practices of software development projects may have an effect on the concept of agile software development and how agility is exploited in a software development project.
Defining agility and the concept of agile software development appears to be challenging, however; the success factors for agile software development projects are better known. Lindvall et al. (2002) recognises following success factors: cultural support, competent team members, and close interaction with the customer as well as customer feedback. The researchers discuss that the culture is formed by the ability of adapting working practices that facilitate the desired culture in the project. The team member’s knowledge and high skill levels in development work enables the trustworthiness of the team in development decisions and the successful customer interaction enables rapid communication between the customer and the development team. (Lindvall et al., 2002)

The author finds both the cultural support and the close collaboration factors interesting since they have also been mentioned to be important success factors in adopting agile software development practices and they seem to relate to the topic of this thesis. According to the study by Misra et al. (2009) important success factors in adopting agile software development practices are such as customer satisfaction, customer collaboration and customer commitment. Misra et al. (2009) found that software developers want the customers to be engaged and associated with the project and not consider the project as a commodity investment. They also find corporate culture having an effect on adopting agile practices, especially when predicting the success of the adaptation of the practices. The culture factor will be discussed in detail in chapter 2.4 in context with the challenge of client engagement in agile practices. Before discussing the issues, the author wants to clarify why the literature considers customer collaboration important for agile software development and what type of activities the clients need to perform in agile software development projects.

The literature in agile software development explains that having a customer participating in the software development project often channels rapid feedback, which in turn enables the development team to attain a better understanding of the customer requirements and needs, and also helps to avoid defects or an undesired deliverable (Cockburn, 2002: 179). The customers are expected to participate in certain agile practices which should help the developers to develop the software according to the needs of the business and users. According to Kujala (2003) user satisfaction with the product or service has shown to increase when users or clients are involved in the development which indicates that the development does benefit from user customer participation.
However, suppliers and the customer may have different perceptions on how much customer participation is needed. Subramanyam et al. (2010) found that when customers intensively take part in the development project, their expectations towards the project are exceptionally high, and therefore could decrease the customers’ perception of project performance. They also found that customers were the most satisfied with the development project when their input was minimal, whereas developers found this situation unsatisfactory. Therefore, we could assume that software suppliers and project teams have to evaluate the trade-offs of involving users in the development and determine the level they want to engage users in order for the agile software development project to succeed.

Agile methods recommend different approaches to enhance the customer participation in the development process. The challenge, however, could be that customers might not have experience in using a particular agile method and do not value customer participation on the same level as the suppliers do. To illustrate what type of agile methods are being used in software development and what type of actions they require form the customer, I will present two agile methods, Scrum and Extreme Programming.

2.3. Achieving agility through agile methods

In this part of the thesis, two agile software methods, Scrum and extreme programming, are presented. The focus is laid on the type of activities the method presumes the customer to perform; however, a short introduction to the method and its practices is presented first. Scrum was chosen as the first presented method since Scrum and its variants (methods that utilise characteristics of Scrum) are the most used agile methods according to Version One (2013). Extreme programming was chosen since it provides an alternative view towards agility by focusing on engineering practices, clear communication, and teamwork (Beck and Andres, 2005: 2).

2.3.1. Scrum

Scrum and its variants are the most used and known agile system development methods at the moment (Version One 2013). The Scrum approach sets the development project a framework which consists of different crucial factors and rules that have an impact on how the development processes are being executed (Schwaber and Sutherland, 2013). Scrum is advised to be implemented through different values, roles, activities, and artefacts that facilitate flexibility, collaboration, and frequent review of
progress in the development process (Schwaber, 1997). Although scrum does not emphasise all of the agile principles it reflects the values of agile software development by setting a framework that should enhance agility in the development project.

In figure 2 the scrum approach is visualised. The development starts by building a scrum team consisting of a scrum master, development team and product owner who supports the development by using and providing knowledge that is required for the project. The scrum master oversees the progress and the overall implementation of the approach; the development team creates and delivers the ordered artefacts; and the product owner communicates the customers’ requirements to the development team in the form of a product backlog. The stakeholders are also to participate in the different phases of the development process such as the sprint planning, daily scrum meeting, sprint review and sprint retrospective. (Schwaber and Sutherland, 2013)

The scrum approach presumes that the development of the product is done through iterations. A product backlog defines the requirements of the developed program and their prioritisation, and therefore continuously changes whilst the project moves forward. Planning is done before the each iteration and always considers the feedback received from the previous iterations and produces a sprint backlog that includes the tasks for the next sprint. The actual development work is done in sprints. The duration and the advancements in the development are continuously monitored by the scrum master through daily scrums or short meetings where the current challenges and advancements are discussed. After the sprint the iteration is presented to the client for further feedback and a retrospective for the scrum team, where they discuss their success and issues of development, is arranged. (Schwaber & Beedle, 2001)

**Figure 2 The activities of scrum**
The scrum approach focuses greatly on self-managing teams and efficiency, but also on customer requirements in terms of functions and their prioritisation. The customer activities are managed by the product owner, but participation of key stakeholders for example in the sprint review, where the latest developed artefact is presented, is also required for the method to succeed. (Schwaber and Sutherland, 2013) In other words scrum expects high customer involvement in the project and its significance is even larger when the customer is externally acquired.

In table 2 some of the responsibilities of the customer stakeholders, i.e. product owner and the representatives of the customer, are presented. The representatives are managers who have responsibility in the project or stakeholders who are impacted by the project. These representatives can be e.g. managers who oversee the costs and risks of projects or the human resources department that manages the resources and time that is granted for the project. In order for the product owner to be able to complete the expected tasks the representatives should enable the power of decision-making and lay trust on the product owner’s ability to provide value to the organisation (Schwaber et al. 2012: 139).

**Table 2  The responsibilities of a customer in Scrum**

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product owner</td>
<td>• To define the requirements according to the needs of the organisation</td>
</tr>
<tr>
<td></td>
<td>• Continuously follow the development and maintain the product backlog</td>
</tr>
<tr>
<td></td>
<td>• Participate to the sprint planning, daily scrum, sprint review and sprint retrospective</td>
</tr>
<tr>
<td></td>
<td>• Be available for the stakeholders</td>
</tr>
<tr>
<td></td>
<td>• Make decisions that increase the odds for the product to succeed</td>
</tr>
</tbody>
</table>

| The representatives of the organisation | • Understand the development activities and their effect on the organisation |
|                                         | • Participate to the sprint review                                              |
|                                         | • Provide feedback                                                              |
|                                         | • Enable the power of decision-making for the product owner                     |

There are only a few studies on product owner performance in scrum projects. However, the studies that have been conducted conclude that the product owner quality varies greatly in terms of engagement to the role and requirements engineering. It seems that product owners do not spend enough time on the maintenance of the product backlog and that the time spent with the development team depends on the product owner himself (Sverrisdottir et al., 2014). These results have not been
confirmed; however if the results would be applicable in a wider scale they were alarming since scrum is highly dependable on the product owners performance.

2.3.2. Extreme Programming (XP)

Like Scrum, Extreme Programming (XP) is also a widely recognised agile software development method. The XP approach relate to the agile principles through its driving values that promote the success of the approach: effective communication with stakeholders through different procedures and activities, feedback that ensures progress towards the set objectives, targeting simplicity instead of enhancing complexity, courage in being innovative whilst grasping current problems and respect for relationships with stakeholders in the project (Holcombe, 2008: 20-25; Beck and Andres, 2005: 18-21).

To enable the team to apply the values in the project the XP approach follows principles that guide the software development and activities that in turn support the established principles and the repetitive iterations until the development comes to an end (Beck and Andres, 2005: 23, 35). The principles and recommended fundamental activities are presented in figure 3.

The XP approach follows an incremental development process where the different fundamental activities are carried through according to the organisations prospects and goals (Holcombe, 2008: 31; Beck and Andres, 2002: 37). The fundamental activities are not performed in a specific order. Instead they build an effective development environment by interlinking tasks of the whole XP team (Beck and Andres, 2002: 36, 73). The principles in turn support both the values and fundamental activities. They guide the team’s behaviour and explain what is to be achieved through the activities in order to attain success (Beck and Andres, 2002: 23).
The fundamental activities guide the behaviour of the whole XP team including the customer; however, the activity that according to the XP approach ensures a rich relationship between the customer and developer is the effect of an on-site customer (Holcombe, 2008: 27). The on-site customer is an available source of the requirements and feedback for the developers (Lindstrom and Jeffries, 2004). In figure 4 the activities of the customer in an XP team are presented. It also shows how the activities are interlinked with the activities that require customer and developer collaboration.
The customer role is central when using the XP approach. The individuals who perform the customer role and its’ duties are the business representatives who should work with the development team on a daily basis and should be empowered to make decisions regarding the development (Lindstrom and Jeffries, 2004).

The XP approach and the effect of an on-site customer have been studied by several researchers. It has been found that to perform the on-site customer role successfully requires the ability to resolve issues in a rapid manner (Koskela and Abrahamsson, 2004; Sfetsos et al., 2006). Sfetsos et al. (2006) explain that a capable on-site customer and their rapid feedback enable the developers to develop a better final product without wasting time on unnecessary development tasks. Although the continuous availability of the on-site customer is recommended most organisations use other ways of communication between the developers and the customer since it is said to be difficult to attain a full-time on-site customer. This can lead the companies to develop their “own method” to practice the XP approach that fits their business environment. (Sfetsos et al., 2006)

2.4. The lack of business client involvement in agile practices

The previous parts of this thesis discussed the interplay between the business clients and the supplier which creates the agile culture in a software development projects. Although different agile methods provide guidelines on how the business client should be engaged in the development, the business clients participation in the agile activities is still often experienced to be inadequate by the suppliers. In this part of the thesis the author discusses the challenge of client engagement in agile activities and limitations and problems that have been identified in previous studies. The author will also briefly discuss why according to the literature clients should participate in the agile activities.

In figure 5 some of the problems that have been found to stem from insufficient client engagement in agile activities in agile software development projects are presented. The current literature does mention several other limitations, but only the particular limitations and problems that are connected with client engagement in software development projects are presented. The author found similarities between the reported phenomena and therefore further categorised the problems into three following categories: communication and collaboration; availability and commitment; and organisational culture.
The overall communication between developers and customers and insufficient requirement engineering originated from communication issues were mentioned in several articles (Hoda et al., 2011; Tanner and Mackinnon, 2013; Holzmann and Panizel, 2013). Organisations have different communication methods and tools in their disposal today; however, the agile principles recommend face-to-face communication. Cockburn (2002: 91) explains that face-to-face communication is more effective than other communication settings due to the modality of face-to-face communication. He continues that the richness of face-to-face communication lies in the settings that would not befall in other types of communication methods. Schermerhorn et al. (2011) refer these settings as nonverbal communication that occurs through facial expressions, body movements such as, eye contact and other physical gestures. Cockburn (2002: 92) adds that not just physical indications such as touch and facial expressions that may indicate ones enthusiasm or desire to speak are of significance, but also sound, e.g. the volume, pitch and pace of the speaker are important in communication. These characteristics of face-to-face communication allow the speakers to interpret each other in an interactive way which reduces the time for response and therefore contributes to

<table>
<thead>
<tr>
<th>Research</th>
<th>Client Related Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoda et al. (2011)</td>
<td>Skepticism towards agile methods, Distance between teams and customers, Lack of time commitment, Large customers, Fixed bid contracts, Ineffective customer representative</td>
</tr>
<tr>
<td>Holzmann and Panizel (2013)</td>
<td>Communication, Relationship between organisations</td>
</tr>
<tr>
<td>J. Livari and N. Livari (2011)</td>
<td>Organisational culture – incompatibility with hierarchical culture orientation</td>
</tr>
<tr>
<td>Ionel (2008)</td>
<td>Availability of the client, Clients view of the delivery (requirements)</td>
</tr>
<tr>
<td>Petersen and Wohlin (2009)</td>
<td>Challenging to make agile methods scalable, Requirements prioritisation</td>
</tr>
<tr>
<td>Ramesh et al. (2006)</td>
<td>Inadequate user-developer interaction, Unqualified user representatives, Cost and schedule estimation</td>
</tr>
<tr>
<td>Tanner and Mackinnon (2013)</td>
<td>Requirements engineering, Interference of higher management, Different culture and workstyles, Lack of understanding of agile, Lack of communication, Lack of experience</td>
</tr>
<tr>
<td>Waardenburg and Vliet (2013)</td>
<td>IT landscape complexity, Traditional development</td>
</tr>
</tbody>
</table>

The categorisation of client related problems:

- Communication and knowledge
- Organisational culture
- Availability and commitment
efficiency in the project (Cockburn, 2002: 93). It is also believed that face-to-face communication facilitates complicated messages and is therefore necessary to achieve efficiency in complex matters (Schermerhorn et al. 2011). Also, it has been mentioned that interactive conversations generate innovative ideas more effectively than individual interpretation of documents (Highsmith, 2002).

Between developers face-to-face communication and collaboration are often continuous and effective if they are closely located to each other in an open working environment (Mishra et al. 2012). Communication does not just take place in formal meetings but also in informal meetings such as break room discussions or other discussions on the office floor space when for example assistance in a particular minor development issue is needed (Hansson et al., 2004). This type of informal communication may not seem important as such; however, it does create knowledge through the collaboration among the developers if the current problems or challenges are discussed, and enables mutual learning and the acquisition of new knowledge for the team members (Becerra-Fernandez and Sabherwal, 2014: 75-76).

Unfortunately, the above mentioned direct communication between the developers and clients is more difficult to establish (Highsmith, 2002). The increased organisational landscape complexity, distance between departments and the distance between development and user locations limit the degree of communication (Waardenburg and Vliet, 2013; Tanner and Mackinnon, 2013; Lindvall et al., 2002). It has been reported that fluent communication between the customer and supplier contributes to project success (Holzmann and Panizel, 2013; Misra et al. 2009) and therefore, it can be argued that fluent communication is vital throughout the development project. The argument for face-to-face communication between the developers and customers being important is that face-to-face communication ensures the rapid feedback of the development and increments (Beck and Andres, 2005: 20). It has also said to build trust in communication for situations when face-to-face communication is not possible to conduct (Cockburn, 2002: 93).

The activities the various agilists, such as Schwaber et al. (2012) and Beck and Andres (2002) suggest enhancing the communication and collaboration between the developers and clients are meetings and customer engaging practices as sprint planning or sprint review meetings used in the scrum method or attaining an on-site customer as done when using the extreme programming method. Keil & Carmel (1995) suggest linking activities such as, organising workshops with customers, exposing customers to
demos, conducting interviews with customers and creating focus groups of customers to discuss the software together with the developers. Collaboration can also be arranged with the help of different collaboration tools and communication techniques such as user meetings and web interfaces; planning games, user stories, story cards and acceptance testing; and by increasing the knowledge in the development processes and coaching (Hansson et. al, 2004; Kautz, 2011; Martin et. al, 2010). Nearly all of the above mentioned activities promote the collaborative environment where continuous feedback from the customer is received. This in turn enables the development team to attain a better understanding of the user requirements and gain experience of applying agile methods. Also, it prevents the developers of making mistakes in further development and rule out unnecessary work (Cockburn, 2002: 179; Lindvall et al., 2002).

Another significant reason to achieve a collaborative relationship between a customer and a developer is the decision-making processes. In agile software development projects decisions have to be made in a quick manner and they need to be done by individuals who have the best ability and knowledge regarding the topic. (Highsmith, 2002) However, in order for the decision-making to be successful the client needs to be available and committed to their role and the development project. In fact, customer availability and commitment (e.g. customer being available on-site, motivated and active and carry responsibility in the project) have found to influence the success of software development (Misra et al., 2009). Agile methods such as scrum and extreme programming attempt to ensure customer commitment by assigning roles (product owner and on-site customer) that carry the responsibility of decision-making in the project. This approach attempts to guarantee business client engagement in the development process. Researchers have found that often client engagement in software development projects is low because the business client representative is not available enough for the project team (Hoda et al., 2011). When investigating the availability and commitment factors it is important to note that most of the studies have been focusing on the developer point-of-view. In fact, Ghobadi and Mathiassen (2015) found that user representatives often found developers being passive in engaging activities (in their study knowledge sharing and communication) whilst the developers found that user representatives inflicted the communication barriers. Also Boehm (2002) has expressed that different perception between clients and developers regarding requirements engineering and changes in business needs may result in collaborative difficulties.
Let us backtrack slightly and discuss communication in the context of communication among the clients (or users). From a knowledge management point-of-view knowledge concerning a particular community or their problem can be created through bringing the community together and enabling communication between the members of the community (Becerra-Fernandez and Sabherwal, 2015: 189). Clients could be encouraged to communication through arranging user meetings and courses which would not only stimulate the interaction among the users, but also the interaction between the users and the developers, and contribute to requirements engineering, if developers were due to participate these events (Hansson et al., 2004). Arranging mutual learning occasions on a continuous pace could also increase the client awareness of the change that the developed system brings to the organisation since the development progress and the possibilities that may require adaptability from the client would be more visible to them (Becerra-Fernandez and Sabherwal, 2015: 76-77). This in turn would help the customer not only to gain experience in software development, but also in how the developed software functions and share this information with users and prepare them for the change.

Although the communication and collaboration as well as availability and commitment of the client are important in an agile project, a successful development process requires involvement and understanding in agile practices also on the organisational level. The culture of an organisation is believed to have an impact on the dissemination of agile practices in a software development project; however, since the term ‘organisational culture’ can be defined in several ways the studies conducted to find a dependency between organisational culture and agile software development activities need to be addressed with caution (Iivari and Iivari, 2010). In this thesis organisational culture is defined as an accumulated tradition of organisational operations that is based on its values and norms, and guides the workers to certain expectations and to perform their tasks accordingly (Mishra, 2010: 366-367).

Limitations for using agile methods in organisations that employ a traditional culture and traditional process approach to development occur e.g. when there are interdependencies between projects or performed activities conflict. The conflict may lead to the organisations lack of involvement in agile practices and therefore they may lose some of the benefits of agile software development. (Waardenburg and Vliet, 2013) In practice activities that are affected by the organisational culture are e.g. decision-making processes, methods of problem-solving, innovative practices, information
filtering, negotiation processes, relationships, and planning and control mechanisms (Nerur et al., 2005). It is evident that organisations should consider organisational culture as a dynamic quality that contributes to the efficiency of the organisation and address the issues that may cause conflicts when perceiving organisational effectiveness (Mishra, 2010: 371; Boehm and Turner, 2005).
3 RESEARCH METHODS

In this chapter the author will explain the nature of this study, the overall research design and how the research analysis is conducted. The chapter starts by presenting the methodological choices for this study and then moves on to describing what type of data is used in this study, how the data is collected and what type of reservations and limitations the collection method may have. In the last part of this chapter the author presents how the data for this study is analysed.

3.1 The nature of the study

This thesis attempts to explore practitioner experiences regarding a software management practice, the agile methodology. The aim of this study is to address and solve problems that currently challenge client engagement and occur in the field of agile software development in a specific context of the relationship between the software supplier and the business customer. It has been claimed that practitioners could improve their skills in professional practices if they had access to management research (Denyer and Tranfield, 2006). This finding has driven the author's desire of providing current knowledge for research and practice as well as to allow the study to function as an encouragement for practitioners and researchers to improve and find management activities that solve problems in their specific environment.

3.2 The overall research design

This study does not attempt to build an explicit theory; nevertheless it attempts to identify themes in the collected data that reflects the experiences of practitioners and therefore takes an inductive stance. With an inductive approach the researcher should be able to build a theory by using the observations attained in the study for the generation of conclusions (Bryman and Bell, 2011: 13). However, the author does want to emphasise that in this thesis the role of theory is ambiguous and should be considered as knowledge that is gained through individual experiences.

The topic of this thesis, the challenge of client engagement in agile activities, has been studied previously; however often the research has focused on the issues and complications rather than solutions that could improve the client involvement. Based on this remark the suitable approach for this research is to conduct an exploratory study that is often recognised in inductive studies (Bernard, 2013: 12).
Considering the knowledge exploited in this study we can determine the epistemological approach i.e. the question of what type of knowledge is regarded as acceptable (Bryman and Bell, 2011: 15). This thesis studies the complications that have been experienced by an individual in a certain environment, and therefore the contextual circumstances should be taken into consideration. The author believes that sufficient theory or knowledge required in this study is the one that increases the researchers understanding behind the significant matters experienced by the people that are being studied. Attaining precise definitions is not the author’s goal when studying people’s experiences. Instead, the author wants to capture the meanings that describe the experiences and the situations. This approach is called an interpretive epistemological approach. (Myers, 2009: 40-41)

The ontological position of this study could be described as constructive approach. The research questions concern the complications and solutions that could prevent or help one to overcome the complication. These research questions contribute to the goal of this thesis, which is to enhance the capabilities of people to create a culture, in this case a culture that emphasises agility. Instead of believing that eternal facts cannot be influenced by social actors the author believes that social actors create and continuously influence the social situations or phenomena, which determines the ontological approach as constructive. (Bryman and Bell, 2009: 21-22)

The research strategy for this study was chosen to reflect the research questions, moreover what type of meanings and symbols the research questions emphasise and what type of data would be needed to understand the meanings and symbols. A qualitative research strategy was chosen since it would allow the author not just to study the people’s social and cultural perceptions, but also to understand the context where decisions and activities are performed (Myers, 2009: 5).

3.3. Methods for data collection

The main interests for data collection in this study are the conceptions and experiences of individuals who work with and understand agile software development in an environment that consists of a software supplier and business customer. This knowledge can only be attained by verbal means. The author could have performed a case study; however, since a case study is often focused on a single case, such as one organisation, (Bryman and Bell: 2011: 68) and it would not have served the purpose of providing multifold results and findings that are applicable in real life situations. The
data was collected through interviews that followed an interview guide i.e. the interview was semi-structured.

The interview guide targeted the discussion at specific themes of interest; however the author decided to allow the interviewees to speak about the themes relatively openly so that the author could attain as rich information as possible and experience what the interviewee found relevant and important regarding the research topic. The author steered the interviews and the discussions by placing additional questions when interesting topics emerged. For exploratory studies an unstructured interview method is recommended (Saunders et al., 2009: 140) and therefore the author wanted to have an open discussion with the interviewee and lean on the interview guide if/when the discussion would dry out.

Although the unstructured interview method is well-liked when it comes to exploratory studies, the author decided for this study to use a semi-structured interview approach for following reasons. First, the author wanted to reach a high level of flexibility in the interview process so that the interviewees would feel comfortable to share his/her view of what is important regarding the research topic. The semi-structured interview approach supported this goal because the approach allows a possibility for an open conversation although the theme is predetermined. (Bryman and Bell, 2011: 467). Second, the semi-structured interview approach suited together with the nature of the interviewees, who mostly could be classified as efficient time consumers. The semi-structured interview approach allows the interviewer to be in charge of the topics and the time used for a specific theme with the help of an interview guide, which makes the interview process efficient, and also shows the interviewee that the interviewer is competent and well prepared (Bernard, 2013: 183). Third, although the author has conducted interviews before she felt that she has not yet mastered the highest level of interviewing and would need an interview guide as a supportive instrument when conducting the interviews. The interview guide which included the themes and a set of supporting questions in case the discussion would dry out was constructed for the interviews (available appendix 1 & 2).

In order to avoid the interviewer from overpowering and having an influence on the interviewees wording and expressions, the author decided to share the main themes of the interview before the interview begun and then let the interviewee discuss them with a sequencing of their own. Also, all of the interviewees were encouraged to discuss
about the themes openly first before leaning on the interview guide, which was available both for the interviewer and the interviewee throughout the interview.

The author also strived to build trust between herself and the interviewee by offering the interviewee the possibility of choosing where the interview would be held and express the confidentiality of the interviewee both in the interview invitation and in the beginning of the interview. The interviewee could also abstain from answering questions that he/she was not comfortable to comment on.

3.4. **Sampling**

In this study the interviewees were selected based on characteristics such as experience and knowledge regarding the topic of the thesis and, therefore the sampling could be said to be purposive, non-probability form of sampling (Bryman and Bell, 2011: 442, May 2011: 117).

The author wanted to approach organisations that already have information regarding the topic of the study. Therefore the author decided to set following criteria for selecting suitable organisations: The organisation has to use the agile methodology in their software development projects, the organisation has to involve their customers in development activities, and the organisation has to operate in a client-supplier relationship. The author monitored that the criteria would be met by researching the proposed organisations websites.

To speed up the selection process the author contacted a Finnish organisation that could provide suitable contacts for the interviews. The list included ten companies. An additional of 13 companies that suited the research criteria was also contacted. The companies and the provided contacts were approached with the interview invite that included the individual criteria demanded for the participants in the interviews.

The individual criteria for the participants were following: The participant needs to have knowledge in the agile methodology or agile methods and the participant needs to have experience in dealing with a client or a customer representative in a software development project. In order to confirm that the interviewees had the appropriate knowledge and experience for this research the participants were asked to describe their professional background in the beginning of the interview. Regarding the experience of the participants the author decided not to require a certain years of
experience since the purpose of the interview was to discuss current problems and the solving of the problems.

3.5. Interviews

The interviews were conducted between February (2015) and April (2015) either at the premises of Swedish School of Business and Administration HANKEN or at a suitable premises selected by the participant. The locations were closed in order to ensure confidentiality and prevent possible interruptions.

Altogether 6 interviews were conducted each between 23 and 54 minutes long. The interviewees represented four different organisations that are active in Finland. All of the interviewees were men and the number of years of experience in software development and agile practices was between 2 and 15 years, median 9 years.

In table 3 the experience levels of the interviewees are presented

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of experience in software development/agile methods</td>
<td>6</td>
<td>7</td>
<td>10</td>
<td>2</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Type of knowledge in agile methodology/methods</td>
<td>Project management and software development with Scrum</td>
<td>Software design and development with Scrum</td>
<td>Project management and software development with Scrum, Kanban and lean principles</td>
<td>Software development with scrum, Kanban and SAFe as well as user interface design and organizational consultancy</td>
<td>Software development with scrum and Kanban as well as training and coaching development teams and consultancy</td>
<td></td>
</tr>
<tr>
<td>Type of experience in client interaction</td>
<td>Both direct and indirect collaboration with clients in projects</td>
<td>Developing on-site with the client and developing in separate locations</td>
<td>Continuous interaction with clients and developers in the company</td>
<td>Developing with clients and guiding and supporting clients in engaging with agile</td>
<td>Interaction with clients in projects and through coaching</td>
<td></td>
</tr>
</tbody>
</table>
3.6. Data analysis

The data analysis is completely based on the empirical data brought together for the study i.e. the interviews. The interviews were recorded and transcribed for further analysis. The risk in transcribing the interviews into text is that different expressions in speech, such as emphasising, hesitation, pace and tone does not translate on the transcript document (Gillham, 2005: 142). Therefore the author decided to highlight and add comments in the transcript when such expressions took place and return to the original recording when interpretation of expressions was needed during the analysis. Also the transcribing was done as soon as possible after the interview which made it easier to interpret the recording.

The transcripts are used to interpret the content of the data and to find categories that reflect the research questions. Since the goal of the thesis is to answer the research questions which content differ from each other the author felt that a categorisation of findings would be necessary. On that account the author decided to use a qualitative content analysis where categories are established and the numbers of events that can be categorised are counted (Silverman, 2001: 64).

The primary goal of the interviews was to attain knowledge in the two main themes of the interview guide regarding the interviewee’s experiences. The author finds that for further analysis it is important to express which topics are based on the participants experiences and which of them are based on their thoughts. Therefore the first categorisation of data would be performed according to the themes in the interview guide. This primary categorisation process is described in figure 10 and will result in issuing the topics and the underlying reasons for discussing the topics in each separate theme. In other words it attempts to explain the context of the discussed topics.

Figure 6  The categorisation of interview data according to the themes in the interview guide.
After the primary categorisation is performed the author will focus on the analysis that would contribute towards the research questions. The analysis processes are described in figures 7 and 8.

Figure 7 presents the analysis process for identifying categories based on the interviewees’ experiences of the challenges for client engagement in agile software development projects. It is important to note that the author is not only seeking experiences that occur continuously among the participants, but also experiences which background is well explained by the participant and the connection between the experience and the perceived topic can be identified. First the individual experiences of each participant will be observed. These observations are used to form shared experiences based on the characteristics and/or similarities of the individual experiences. Thereafter the discussed experiences will be translated into categories which reflect the results of issues that limit the agile culture in project.

In figure 8 the analysis process for finding techniques and ideas that have or could increase the business client engagement in the activities experienced by the participants. In this analysis it is important to separate the used techniques and the
techniques that could be used according to the participants’ beliefs but have not been tested by the participant. The analysis starts by identifying the activities where lack of client involvement occurs from the recordings and transcripts. The activities have also been identified in the previous analysis. After that the author focuses on the experiences regarding a particular mentioned activity and how the challenge of client engagement in that particular activity was solved or prevented or could have been solved or prevented according to the participants’ beliefs and ideas from. Based on the recordings and transcripts the author proposes techniques that may prevent or counteract insufficient client engagement.

Figure 8  The analysis process for identifying used and believed techniques that solve or prevent the lack of client involvement.

3.7. Limitations of the study

Often when discussing about the quality of a study researchers refer to the reliability and validity factors. In short reliability represents the repeatability of a study (Hirsjärvi & Hurme, 2001: 186) and validity represents the accuracy of the used data sets and the accuracy of the presented results (Bernard, 2013: 45). Although the reliability and validity factors of a study are important, in some studies in the area of social research assessing the nature of the study and the possible contribution of the study could be seen as important when considering the quality and limitations of a study (May, 2011: 280). In this study the author will focus on the limitations and quality of the data as well as the analysis. However, the author will also consider the nature of the study when assessing the quality of the study and emphasises that the goal of the study is to
improve the understanding of the topic of this thesis and encourage to further discussions regarding the future of the topic.

3.7.1. The limitations of the data collection

The aim of the interview was to collect data based on the participant experiences. Although the interviewees were allowed to discuss the topics freely it is impossible to evaluate if the interview situation has affected the description of the experienced reality. On this account the reader of this thesis should understand that the data is not based on the interviewers’ interpretations or observations from real life situations, but the data is based on the interviewees interpretation and observations from real life situations that has been verbalised according to his/hers own perspective. Also the study may not consider all of the circumstances of the real life situations if they have not been mentioned by the interviewee in the interview situation.

The interviewee’s perspective and the circumstances of the situation do place some limitations on the study that have been emphasised in the beginning of this chapter. These limitations also affect the validity of the data. Basically, the author strived for data that would reflect the real life situation of the participants; however, the results based on the data only reflect the real life situations implicitly and should not be understood as absolute truths and rules. Instead the results based on the collected data should encourage the reader to consider their own approach towards the topic of this thesis and state or their own customer or supplier relations.

When considering the reliability of the study, the author feels that the method for data collection and the results of the study meet the original expectations of the quality. The reliability of the study was reinforced by recording and transcribing the interviews, and the authors’ effort to reach mutual understanding regarding questions and the content of interviewees’ answers and viewpoint in the interview situation.

3.7.2. The limitations of the performed analysis

The performed content analysis focused on categorising the experiences and thoughts of the interviewees. In general limitations that may have an effect on the results of a study can occur when the author interprets the data i.e. the analysis process. According to Hirsjärvi and Hurme (2001) a successful interpretation of data is reached when the reader, author and the participants of the study interpret the text similarly (see figure
In order to reach a similar interpretation with the participants the author strived to understand the participants’ experiences and the contexts where the experiences took place and then conduct the analysis by reflecting those experiences. In order to influence the readers interpretation the author strived in the theory part of this thesis to describe why the clients should be involved in software development projects and how the phenomena of lack of client involvement in agile activities is currently perceived.

Figure 9  A successful interpretation of the data – interpretations from different viewpoints (adapted from Hirsjärvi and Hurme, 2001: 151)

Another limitation that should be acknowledged regarding this study is that the interviews were conducted in Finnish language, however the analysis and the results are provided in English language. In order to avoid language mistakes or language related misinterpretations in the analysis the author decided to conduct the analysis simultaneously in Finnish and in English. This required the author to return to the original transcriptions several times when interpreting similarities and categorising the results and translating the findings.

3.7.3. An overall appreciation of the methodology

In summary the author finds that the methods chosen for this study reflect the requirements of the research questions and the nature of an exploratory study. The author aims to solve client engagement challenges that are experienced in agile software development projects and increase the knowledge of how to engage business clients effectively. To reach this purpose experienced professionals (suppliers) needed to be approached and challenged to consider ways of improving the business clients’ knowledge in agile approach and their engagement in agile software development projects.
When conducting the interviews and the data-analysis the author noted regarding the second research question that it was difficult for the interviewees to discuss solutions to challenges that they had not used or experienced themselves. The discussions regarding activities of techniques that the interviewees would believe to solve problems with client engagement often lead to a wider discussion of what should be done or what type of premises there should be in order for the agile approach to be accepted and implemented in organisations. Therefore the author decided to focus on the part of the analysis with the experienced and used techniques rather than the ideas and beliefs of the interviewees. However, the author did not disregard any ideas provided by the interviewees rather they were given less priority in the analysis part and given more emphasis in the discussion regarding what software suppliers call for from the business client organisations.

The author also noticed that the exploratory research was demanding to conduct. The authors aim was to get the interviewees discuss about their experiences, but decided to prepare an interview guide to support the discussion. The interview guide did support the discussions; however, the author noticed that it also might have navigated the discussions too much and it is possible that some potential topics that were not mentioned in the interview guide have not been issued in this thesis.
4 ANALYSIS AND RESULTS

This chapter presents the analysis and the central findings of the interviews. To conduct the analysis the interviews were transcribed. After transcribing the material comments with relevant content for each research question were extracted and they were assigned a meaning that described the information for further categorisation. When the information was extracted from the transcriptions the author attempted to identify similarities in the content and created categories that describe the data collected in this study. Each analysis process used in this thesis will be presented in figures and explained before discussing the findings. Also citations from the transcriptions are used when important themes and findings need to be emphasised.

The structure of this chapter is built to follow the conducted analysis and the research questions of this thesis. In this chapter the author will present the analysis process and the data content of the respective analysis. The results and findings of the study will be discussed in the fifth chapter where similarities and differences with previous literature (presented in chapter 2) will also be identified. The chapter ends with a summary where the results are summarised and the authors’ interpretations regarding the findings will be discussed.

4.1. Client engagement in agile activities

As discussed in the second chapter of this thesis engaging business clients in certain agile software development activities has found to be beneficial. Although client engagement and its benefits are recognised, previous research states that software suppliers and the development projects experience insufficient customer engagement in agile activities. The first research question in this thesis focuses on identifying problems regarding client engagement in agile software projects which limit the use of the agile approach. The business client may agree to use or adjust their working style according to the supplier’s recommendation of following the agile approach, but for a reason or another fails to follow the recommended practices. The analysis focuses on activities where client engagement is desirable, but can be insufficient according to the suppliers i.e. the interviewees. However, before recognising the issues it is important to know how the client is expected to be involved in the development, what their role in the project is and what type of methods are being exploited in the software development projects.
4.1.1. Methods and client roles

The mostly used methods mentioned in the interviews were scrum, kanban, SAFe and lean methodologies. All of the interviewees found that they had a solid knowledge of the used method; however, all of them mentioned that the methods they use do not completely follow the recommended ‘text book’ framework.

“The methods we follow are not set in stone, we do not follow scrum exactly as the framework recommends. Instead we use our own experience and follow the bits of the method that fit our way of working” - Interviewee 4

“We aim to follow the philosophy of a method, to be honest our choice of method or philosophy is partly dictated by the characteristics of the customership” - Interviewee 3

The experience and the culture of the development team and the characteristics of the project have an influence on the choice of method according to the interviewees. The characteristics that influenced on the choice of method, and were mentioned in the interviews, were the geographical distance between the client and the supplier, and the expected involvement of the client. The team experience and the culture i.e. the working style of the development team also influenced on the choice of method for a project. Two of the interviewees mentioned that the agile culture is well integrated in the working methods of the team and that the team members automatically work with an agile approach since it is encouraged to do so and works for them.

According to the interviews the client is often assigned as the product owner in the development project. However, clients were also in roles such as project managers, end users or representatives of a certain area of business. Although the clients were often assigned a role by their own organisation or by the recommendation of the supplier the activity of the client was identified as the most critical aspect in the role they were performing for the success of achieving an agile culture in the project according to the interviews. In figure 10 the qualities suppliers expect of a client representative and that were mentioned in the interviews are presented in a list form. Based on the interviews the client representative is anticipated to be a communication channel between the client organisation and the software supplier, and can reach the organisations business area representatives and be involved in business decision-making.
Although the activity of the client representative was emphasised by the interviewees they also expressed their understanding that the role of the business client representative is demanding. Based on the interviews the business client representative might be performing the role on the side of his daily tasks and original title and not have enough time to dedicate themselves for the development project, they might not possess the required power in the organisation and they may not have the required support of the organisation, which might affect their decision-making.

4.1.2. Challenges in client engagement

It is evident that there still are problems and issues that limit the establishment of a functioning agile culture in a software development project. As one part of this thesis the author focuses on the issues and problems that occur when the business client’s working style does not support the agile culture established by the suppliers. The research question the author is aiming to answer is:

RQ1: What type of problems and issues occur in software development when the business client does not engage in the agile approach and activities recommended by the supplier?

According to the interviewees the business client engagement and how clients follow the agile approach varies between projects. As mentioned in the previous section the interviewees when speaking about the client most often referred to the product owner
or the business person who is in charge of the product at the client. Estimating the level of business client engagement in agile development projects and working methods today could not be assessed, although most of the interviewees mentioned that in the past years according to their experience the business clients make an effort to follow the suppliers recommended working methods i.e. agile methods; however, they do not always succeed in this.

“The engagement varies quite a lot. Some clients are very conscientious when others do not understand their duties or do not care or have the passion for the project” – Interviewee 1

“When we started following agile, about ten years ago, it felt like it was very difficult to engage the clients to it. It was more like we had to compel the clients to follow agile. It wasn’t always possible partly because of the organisational structure they had.” - Interviewee 6

In figure 14 the analysis process for discovering the challenges in business client engagement are presented. The figure presents the issues where similarities between interviewees’ experiences were found in the first analysis phase. In the second column the issues are summarised and in the third column they are categorised according to the content of the issues and problems. The aim of the analysis is to identify the experienced problems that have an effect on the agile working culture and identify categories that reflect the underlying cause for the experienced issues or problems.

Figure 11 The analysis for identifying issues and problems in business client engagement that limit the development projects agility.
The first issue found to disturb the agile approach in software development projects was identified to be knowledge related. The interviewees discussed their concerns regarding insufficient knowledge regarding the needs of the business and this affecting the process of finding the right solutions for specific business needs throughout the development. Several of the interviewees mentioned that often problems occur in development when the requirements or prioritising do not follow the actual needs of the business. All of the interviewees expressed that sufficient requirement engineering is important for the success of the development project and affects the efficiency of development.

The causes for the insufficient knowledge of business needs were believed to be inadequate communication between the business representative and limited resources for business need mapping. According to the interviewees and their experiences the requirement engineering process is a demanding task and requires business need knowledge from several business experts and the organisation. Three of the interviewee’s mentioned that according to their experience the product owner is often left alone in the organisation to ensure that the software is developed according to the needs of the business.

“The product owners do not have any helping hands in organisations. If we have experts in organisations they should definitely be included when determining the business needs.” – Interviewee 3

“It is unfair to expect that the product owner would do everything between heaven and earth. There needs to be a team that has the knowledge to perform the customer role” – Interviewee 5

It was mentioned that the client representative does not necessarily have to have complete knowledge regarding business needs but he should have the required contacts in the organisation to find out what the most significant business needs are. Several of the interviewees mentioned that the client representative can be very skilful, but does not necessarily have the premise to access the knowledge needed for successful software development. Therefore, also the business experts need to have resources, mainly time related resources according to the interviewees, to be able to reflect their actual needs.

“The prioritising does not base on reality, after developing something we notice that there is no value in the priorities and that the priorities have been given to the rep instead of going to a business expert who could help with defining the actual priorities.” – Interviewee 6
However there seems to be some variation between projects since at least two interviewees had witnessed situations where other business experts in the client organisation were used as contacts in matters concerning their expertise without having to contact the customer representative.

“Of course we need someone who we can communicate with directly, but sometimes it would be good that we could communicate, e.g. if we need to discuss technological issues, with someone who is in charge of the technology side in the company” – Interviewee 3

Also knowledge that is based on feedback was mentioned and considered important for developing software further and at least one of the interviewees felt that client organisations do not exploit the possibilities of feedback. E.g. they express their concerns or satisfaction with the software inside the organisation, but do not communicate all of the concerns or satisfaction to the supplier.

Insufficient knowledge in business needs often lead to inefficient development. Many of the interviewees mentioned that work often had to be redone after noticing that the prioritisation and business needs does not base on the real business needs.

Although knowledge of the client was considered an important factor when trying to create and sustain an agile culture in the project, some interviewees expressed that in some cases the lack of knowledge of the client can improve the suppliers own understanding and skills of the business for which the software is being produced since they have to make a greater effort to understand specific business needs. However, all of the interviewees expressed that it would be more effective to receive knowledge about the business needs and requirements directly from the client representative.

Knowledge in actual agile methods was not directly perceived as a problem since most of the interviewees would introduce their working methods either before or in the beginning of the collaboration. However it was mentioned that experienced customer representatives could perform their duties and adapt into an agile environment more efficiently than unexperienced ones. Although experience from an agile environment was considered good according to the interviewees they also thought that experience regarding the business for which software is developed is of importance. The interviewees also wished that client organisations would engage themselves to agility in supporting tasks that are important for the development. This observation will be discussed in the next and the last section of this part.
The second problem found to affect the agile approach in software development projects was identified as organisational structures. This issue was often connected with the power distribution i.e. decision-making conditions of the client organisation.

All of the interviewees mentioned that they have experienced lack of decision-making that affects the agile culture in software development projects. The interviewees mainly had experience of situations where the decision-making process was delayed or wrong decisions that did not bring the expected values for the product were made. These situations impeded the agile culture by decreasing the development efficiency. The interviewees preferred that the client representative had the power to make decisions or at least have right connections in place for the decision-making.

“Sometimes I find that the client cannot make decisions fast enough. To be able to be efficient we need a direction and clients should not ponder things for too long” - Interviewee 2

“There is no point to pretend that we have a product owner in the project if this person does not have the power to make decisions” – Interviewee 3

The experiences regarding the power distribution and decision-making varied between informants. Based on the interviewees comments and their background the author found implications that in smaller client organisations the power distribution affected how the different roles in the software development projects were handed out and therefore decision-making could be found to be more effective. In larger organisations the power distribution followed the organisational structure and in cases where the client representative did not have access to the appropriate connections the decision-making process was found to be ineffective and the risk of delivering a product with lower value increased.

The third problem found to disturb the agile approach in software development projects was the poor availability of the client. The interviewees’ comments mainly concerned the contacting capabilities i.e. the continuous availability of the client representative and the sharing of knowledge and information that could be beneficial for the development project.

According to the interviewees the main issues in availability are that the client representative or product owner is not reachable when needed, does not respond to contact requests, works from distance and is not active enough to promote the collaboration. However the current state of client availability was difficult to assess
since the interviewees’ expressed that the availability varies in projects and between customer representatives and businesses. Three of the interviewees mentioned that according to their experience client’s who are familiar of how agile projects are performed are more available or at least understand the importance of being available for the supplier or the developers.

“Some client’s have an understanding of agile and that when a project is done with the agile approach they need to be available to us.” – Interviewee 2

All of the interviewees mentioned that poor availability is often the result of product owners or client representatives having a too heavy workload. The client representative might have several titles or projects to handle and does not have the possibility of performing all of his/hers tasks in the given conditions.

“Although the client representative has the required personal conditions for executing the project his working hours might not be enough for it because he has other responsibilities in the organisation that also take up his time.” – Interviewee 5

Other reasons for poor availability that were mentioned by the interviewees were possible personal reasons or that the client representative does not find the project interesting enough among his/hers other tasks or projects.

The views regarding where the problem of poor availability of the client representative leads to were fairly similar between the interviewees. All of the interviewees mentioned that poor availability affects the progress and pace of the project in a negative way since work where the consultancy or decisions of the client representative is vital cannot be done or have to be redone after the client representative had been reached. One of the interviewees mentioned that poor availability of the customer representative can also impair the prospects of creating a functioning relationship with the part of the client organisation that is affected by the project.

“The product owner should enable us to contact parties that have expertise in a specific task. This is impossible if the product owner is not available or does not have interest in the project.” – Interviewee 4

Poor availability of the customer representative was also experienced to have an effect on the amount and quality of the communication and collaboration between the client and the supplier. Communication as such was not seen as a problem; however, insufficient communication due to poor availability was considered as an issue among the interviewees.
All of the informants preferred face-to-face communication with the clients. According to the interviewees face-to-face communication is important for reasons such as, suppliers often use visualisation to improve the understanding regarding the discussed topic, face-to-face communication increases the sense of solidarity between the client and the supplier and face-to-face communication increases the suppliers understanding of the clients business as well as the clients understanding of how the software is developed and how the development affects the business.

“Face-to-face communication is definitely better than other communication. We use a whiteboard for drawing when things are unclear and that usually improves understanding, the risk with different chat tools is that misunderstandings occur” - Interviewee 2

“I prefer that people are in the same space when things are discussed. Is it more likely that things are understood in the same way” - Interviewee 5

Although face-to-face communication was valued high among the interviewees, they also considered other communication methods significant. Three interviewees mentioned that written communication enables the possibility of retrieving information of what type of decisions have been made and how some development matters are perceived.

The interviewees mentioned that according to their experience the communicational problems often stem from time related issues. As already mentioned according to the interviewees the client representatives do not have enough time arranged for the interaction with the supplier and the activities agile development requires.

“On an individual level people are often committed to perform their tasks accordingly, but sometimes the premises set on higher organisational levels hinder them from doing so ” - Interviewee 5

Several interviewees noted that the project members and the client representative perform the client role in tandem with another role in the organisation which was perceived to affect the engagement level. However, two of the interviewees also mentioned that also the supplier needs to encourage the client to communication especially if the client is inexperienced in agile practices.

The fourth problem found to disturb the agile approach in software development projects was identified as the organisational limitations and clients’ existing expectations of software development. The expectations were directed towards the nature of software development, the requisite resources and contractual expectations.
Several of the interviewees mentioned that client organisations do not share the same vision of software development with the suppliers. Especially on the higher levels in larger organisations software development is still seen as an individual definite project instead of a project with a constantly changing environment that moves in conjunction with the nascent organisation. According to the interviewees the development team that consists of both supplier representatives and client representatives are often the most enthusiastic individuals in the projects and share the interest of exploiting an agile culture. However, the enthusiasm tends to decrease if the actions or demands from the higher level in the client organisation prevent them from participating in required agile activities.

The organisational attitude and their approach towards software development have an effect on the client engagement in agile according to the interviewees. Several of the interviewees mentioned that organisations underestimate the required effort they should offer the project and tend to think about the project as an external project or a smaller piece of the organisational puzzle. The interviewees agreed that this phenomenon is one of the reasons why agile culture is difficult to implement to organisations.

“It seems that clients think of software development as a building project, like for example building a table. For us it is nothing like a building project. It is more like a journey we take together and anything can happen.” - Interviewee 4

“The assumption on the higher organisational levels is that agile is something the developers use and that it does not affect anything else in the organisation” - Interviewee 5

“The worst case scenario is that the client attempts to externalise the development altogether” – Interviewee 6

The interviewees referred several times in the fact that the supplier seldom has the chance to have an influence on the organisation or its working style in the project. According to the interviewees in individual teams the agile culture is often possible to establish, but to implement change that would allow optimal conditions for software development success is harder, if not impossible, at the current state of organisational approach towards software development. The interviewees mentioned situations such as preparing preplanning documentation which often sets a great pressure on the client representative who is in charge of providing documentation regarding the future development for the higher management and also in charge of following the set goals. When the client representative needs to focus on what has been promised to the higher
management the risk of unnecessary work and inefficiency grows. Some of the interviewees mentioned that it would be important for the whole project team, the supplier and the client organisation to focus on the question of “are we doing the right things?” instead of trying to finish predetermined functionalities in the given timescale.

“The product owner has the pressure to prepare project documents in advance for the higher management because they demand them. The problem is that we do not really have the access to the higher management to explain and increase their understanding of agile” - Interviewee 4

Another problem the interviewees mentioned was that the client organisation sets the project team for the project before the collaboration starts. This was experienced both good and bad. In some cases it had shown that the established project team did not possess the necessary knowledge regarding business needs or decision-making power in the organisation. Other interviewees found a preassembled project team advantageous since it showed that the organisation had interest in finding the right talents in the organisation who could contribute the project success. One interviewee pointed out that organisations where designing is a part of the core business have a better grasp of what software development is and why agile and its activities are advantageous for software development. Several of the interviewees found that experience in similar project setting was valuable when implementing an agile culture in organisations.

Regarding the contractual expectations the results were more difficult to interpret since none of the interviewees mentioned the problem on one’s own initiative. The interviewees shared the view that predetermined requirements in contracts do still arise; however, clients seem to be open to different contract models and an agreement regarding the contract details is often mutually agreed.

“To set up contracts is really difficult sometimes. The client needs to trust us in order for agile to be fully exploited” - Interviewee 1

The author feels that the result regarding the contractual expectations should be interpreted with caution since the interviewees seemed hesitant in their answers regarding contracts and that the phenomena should be further examined before any conclusions are made.
4.2. Improving client engagement in agile activities

The second research question of this thesis aimed to recognise the applied and believed techniques software suppliers can use in order to increase the client engagement in agile activities and setting an agile culture in a software development project. The research question for the second analysis is following:

RQ2: How suppliers can increase the business client’s knowledge and engagement in agile practices?

The interviews showed that it was significantly easier for the interviewees to express and discuss tangible techniques they have experience in than techniques they believe to help in engaging clients to participate in agile activities and agile culture. Therefore the author decided to focus the analysis on the interviewees’ experiences of the techniques they have used to engage clients in agile activities and discuss the techniques or phenomenon that the interviewees believed to have an impact on the level of client engagement in agile activities and culture in context with the actual used techniques.

In figure 12 the techniques and practices that are applied to increase the client engagement in agile activities are presented. The analysis starts by focusing on the categories discovered in the previous analysis regarding the issues and problems that lead to lack of client engagement in agile activities. These categories are presented on the left side of the figure. On the right side of the figure the practices that are believed to counter effect the respective issue are presented.

Figure 12 Techniques to counter affect the lack of client engagement in agile activities.
The first issue discussed with the interviewees was the insufficient business need knowledge. The proposed solutions for this issue are involving business experts and users early in the development, focusing on finding real business needs and validating through feedback.
All of the interviewees mentioned that expert knowledge is often needed in software development projects; however, this knowledge is spread across the organisation and discovering the right and relevant knowledge for software development is challenging. Therefore the client representative or product owner chosen for the task should have the right contacts and the organisational premises that enable him/her to discover the right business needs in place. The interviewees also expressed that it is difficult to evaluate the information regarding business needs i.e. if the information is based on real business needs or expected business needs of the organisation. Three of the interviewees mentioned that they recommend the project team to involve internal business experts in the project right from the start in order to map the needs successfully. Also access to discuss and observe the users was found to be important. This was said to increase the understanding of the business and daily tasks the users perform.

The discussion regarding business needs and the client representatives or product owners tasks often lead to another discussion regarding the prospects of performing the task in the organisation. Insufficient resources were found to be an issue in determining real business needs and according to the interviewees the software suppliers have extremely slim possibilities to have an influence on what type or how much resources the project is allocated.

“Resource wise it is difficult for us sometimes because we are forced to make concessions and we cannot expect that things would be done according to our recommendations.” – Interviewee 1

Four of the interviewees expressed that when developing software the outcome of the development should be validated as soon as possible. Validating the product or a function of a product as early as possible allows the developers to discover if the software is developed according to the real business needs and if it delivers the highest possible value to the client organisation. The tangible examples of validating a future product or outcome according to the interviewees were feedback as well as discussions with the right business experts and users. One of the interviewees mentioned that visualisation of a future product or outcome is an effective tool for receiving feedback and another interviewee mentioned that interviewing the experts and users whilst describing the outcome is worthwhile. However it was mentioned that the challenge with feedback is that the right experts or users need to be found in order to receive sufficient feedback.
“The product owner does not necessarily need to give us specific information. If we have the access to interview the end users we can also show them and ask for feedback based on our descriptions or even pilot versions of the product.” – Interviewee 6

The second issue discussed with the interviewees was decision-making and power distribution in organisations. The interviewees expressed that it feels difficult if not impossible to influence the power distribution in the organisation. However three of the informants expressed that demonstrating that the agile approach is valuable in software development is important and may affect the processes in the client organisation. Although, any tangible examples of that demonstrating the agile approach to the client organisation would affect the power distribution could not be provided.

Four of the interviewees mentioned that some organisations adapt to the agile approach better than others. Two of the interviewees expressed that these organisations are often familiar with design or planning and understand the complexity of software development.

Regarding decision-making the interviewees expressed that the suppliers can help the client representative or product owner to make decisions if they have some relative experience of the industry and can provide data to the client on what type on solutions have been working in respective issues.

The third issue discussed with the interviewees was the availability of the client. Several solutions to improve and establish successful collaboration with the customer representative or product owner were provided by the interviewees. The solutions discussed were coaching, scheduling and closeness in the collaboration. The supplier coaching the client representative or product owner to follow the required agile activities was found to be important especially if the client representative or product owner was inexperienced or the project was the first endeavour between the client and the supplier. Most of the interviewees mentioned that the agile approach is presented to the client in the start of the collaboration by the suppliers and some clients are aware that the suppliers they contact prefer agile approach in development.

Regarding the availability of the client all of the interviewees mentioned that they use scheduling in order to attain a regular encountering with the client. The suppliers and client would prearrange weekly meetings at a certain time and place to ensure the communication and collaboration needed the development of the particular software.
“At the moment we have fixed weekly meetings with clients where things are discussed openly. If something needs more discussion we agree about the timetable and further meetings with the client.” - Interviewee 2

The interviewees expressed that scheduling usually works to good effect; however two of the interviewees mentioned that clients unfamiliar with the agile approach may find it difficult to understand why they need to attend the weekly meetings. Both of the interviewees suggested the same solution for the problem which was that they would encourage the client to attend the first couple meetings and after that the client usually understands the value of the meetings and attends from own initiative. One of the interviewees mentioned that the suppliers should consider that the client feeling themselves needed in the meetings is important in order for them to continue to take part in the meetings. The suggested means for making the client feel needed in the meetings were explaining how the development works and what the role of the client is in the meetings, concretise the development in hand for the client and include and assist the client in problem solving.

Other activities that according to the interviewees increase the level of engagement of the client were trust building activities that affect the closeness of the collaboration. Four of the interviewees mentioned that the client should feel as a vital part of the development team and that their tasks deliver an input for the development and the team. The interviewees mentioned activities such as, including and assisting the client in problem solving, assisting the product owner to report success and failures to the higher levels of the organisation by discussing things that were done well or things that could be done better, celebrating success together and invite the product owner to social team sessions or events.

“Even the simplest things can improve the clients’ engagement, celebrating the latest achievements, planning how the client’s knowledge could be utilised in the next meeting and really make an effort for the client to feel included.” – Interviewee 6

Two of the interviewees mentioned that short distances between the supplier and the product owner improves the availability of the client. Having the development team at the client’s business premises would facilitate the communication between the client and the supplier; however the interviewees also mentioned that the client or product owner also needs to be interested about the project for the communication to be sufficient.
To strengthen the collaboration and communication one of the interviewees expressed that in addition to face-to-face communication the client and the supplier should agree on the communication tools used during the project since face-to-face communication is not always possible.

The fourth issue discussed was the organisational expectations, approach and attitude towards software development. All of the interviewees mentioned that the support of the client organisation should be improved for the agile approach to bring the highest possible value for the software development project. The suggested solutions that affect the organisational expectations, approach and attitudes were trust building activities, demonstrating that the agile approach performs and adds value, engaging the organisation to agile approach, enhance the openness to continuous improvement and focus on fairness in contracts.

Similar trust building activities were mentioned as a possible mean to engage the client organisation in supporting the agile approach as were mentioned in the previous part regarding the availability of the client. However, if these activities would improve the organisational expectations, approach and attitude towards software development depends on if the project team assigned from the client actually reflects the power of the organisation according to one interviewee. The interviewee also mentioned that certain activities might work for some organisations whilst in other organisations they might only improve the team’s adoption of agile and not the organisations.

The interviewees mentioned that demonstrating that the agile approach performs well in software development and trying to engage the organisation through training and discussions to support the agile activities works with some clients. The interviewees provided examples regarding the demonstration of the agile approach such as presenting successful cases where the agile approach has brought value to a previous project and showing what the benefits and results entailed from applying the agile approach in the project. However it was mentioned that the offset of the organisation i.e. their expectations, approach and attitude towards software development may have an impact on how well the approach is assimilated in the higher levels of the organisation and that this presumption is difficult to break up if the organisation is not prepared to a possible change.

Regarding training role descriptions were seen as an effective tool since organisations are used to operate according to a framework.
"A lot of large organisations are used to operate in a set framework. By presenting a framework and its’ role descriptions the approach is easier to implement.” – Interviewee 5

Though, it was also mentioned that there should be interest in the approach on the higher levels of the organisation in order for the proposed tools to engage the organisation in applying agile approach or supporting its use on the development team levels. Demonstrating how the development approach affects project costs was found effective to awaken the organisations interest in the agile approach according to three interviewees when trying to have an influence on the client’s expectations, approach and attitude on software development. However they also mentioned that this approach requires an access to the higher levels in the organisation who oversee the costs and budgeting which is not always granted.

The interviewees found that the agile approach does attract the attention of some organisational leaders. However several of the interviewees expressed their opinion that more could be done to introduce the agile approach to organisations. Two of the interviewees mentioned that the agile approach should be explained in simple terms without using industry specific language and it should be demonstrated with examples from different business environments in order for the agile approach to be recognised as more than just a working method of software development professionals.

In fact all of the interviewees expressed that openness to continuous improvement in businesses would be beneficial in some context. Four of the interviewees discussed continuous improvements in the context of business development and expressed that through engaging in different activities businesses could find the best suitable methods to move the business forward and be more efficient.

Business contracts and their specification were discussed shortly with four of the interviewees. All of the interviewees had similar thoughts regarding business contracts. Contracts with specific requirements are still suggested by the clients; however, through offering the client alternative contract models a mutual agreement is often reachable.
5 DISCUSSION

The results of the study indicate that agile software development projects in an environment set by a supplier and a client in Finland suffer from following issues: insufficient knowledge of business needs, power distributions in organisations, availability of the client and the overall organisational expectations, approach and attitude towards software development.

In this chapter the author shall discuss the results and the practical implications i.e. how they affect agility in software development projects. First the author discusses the challenges and problems found in this study and their implications in detail. Second the author will discuss how the issues could be solved based on the results of the study. The chapter ends with a summary where the author compares the results reported in previous studies with the results of this thesis and also briefly discusses the current state of agile software development in a supplier-client environment in Finland and ponders what type of actions should be considered in order to increase the overall value gained from agility.

As discussed in the second chapter of this thesis some limitations and their consequences to agile software projects have been addressed in previous studies and literature. In figure 13 the limitations found in previous research and the limitations expressed in this study are presented. The figure shows that the results of this thesis reflect the issues and problems addressed in previous studies, with a few exceptions. For example the communicational barriers were mentioned in previous research; however, in this study communication was not perceived as the underlying reason for limitations in exploiting agile. However it was found to deteriorate if the client did not have sufficient resources for continuous communication. It was also found that not only do the client organisations working style affect the agile culture in software projects, but also the organisations expectations regarding software development could limit the successful exploitation of agile software development. The similarities and differences in results are further discussed in following subsections.
Table 4  Comparison of limitations

<table>
<thead>
<tr>
<th>Categorisation based on previous studies</th>
<th>Categorisation based on the study of this thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication and knowledge</td>
<td>Insufficient knowledge of business needs</td>
</tr>
<tr>
<td>Organisational culture</td>
<td>Power distribution in organisations</td>
</tr>
<tr>
<td>Availability and commitment</td>
<td>Availability of the client</td>
</tr>
<tr>
<td></td>
<td>Organisational expectations, approach and attitude</td>
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</tbody>
</table>

5.1. Insufficient knowledge of business needs

Based on the study it shows that the efficiency agile culture should bring to the development suffers from lack of business need knowledge in organisations. In some projects a great amount of development work must be redone since the client representative does not have the premises to discover and prioritise the requirements the business and the users have for the software. According to this study the premises that contribute to requirements mapping are capabilities to access and share information and feedback and the time related capabilities of the client. The time related issues as well as the sharing of knowledge have also been mentioned in previous research regarding the performance of agile software development (e.g. Hoda et al., 2011 and Nerur et al., 2005).

Hoda et.al (2001) mention that lack of customer involvement in agile projects results in e.g. loss of productivity since developers need to make assumptions regarding the client’s business needs and priorities, problems in gathering and clarifying requirements and problems in securing feedback. Similar results were found in the study of this thesis and they could be tied to the set premises to gain knowledge for the project. Waardenburg and Vliet (2013) discuss centralised IT departments as a premise that can possibly limit the knowledge sharing processes in organisations. In the study of this thesis IT departments were not directly mentioned; however the capabilities of a client representative to gain knowledge were expressed to be limited and an assumption that the distance between the customer representative and the users as well
as the customer representatives time consuming tasks outside the project may affect the capabilities to share knowledge and lead to insufficient requirements engineering.

The literature used in this thesis implies that successful sharing of knowledge occurs through communication, and face-to-face communication is recommended by several authors (Cockburn, 2002; Schermerhorn et al. 2011; Highsmith, 2002). Regarding this study the interviewees were not able to describe the internal communication in the client organisations; however, the interviewees also mentioned that they prefer face-to-face communication with the client, and in some cases even the interaction with the users. Similar results were discussed in the study of Gobadi and Mathiassen (2014) where they also found that the clients wished for closer interaction. However, one should also consider the results of the study by Subramanyam et al. (2010) regarding the increased expectations towards the developed software when the involvement of users increases in the project. The interviewees noted that according to their understanding the client representative often has to perform the role alone and the required support for the requirements mapping and prioritisation might not be in place in organisations.

Based on these findings, one could assume that knowledge sharing processes are not fully exploited in organisations and could therefore affect the success of agile projects where rich knowledge is required. The results imply that face-to-face communication should be emphasised to be important also between the client representative or the supplier and the users to support the agile development in requirements engineering. However, in order to confirm this assumption additional research regarding the topic should be performed.

The suggested activities that would have an improving effect on the insufficient knowledge on business needs in this study were involving business experts and users in requirements mapping, focusing on finding the real business needs and fast validation through feedback. The results indicate that suppliers preferred if client organisations would strengthen their capabilities in requirements mapping and prioritisation. The workload of the customer representative could be distributed to several business experts or individuals who would be able to describe the requirements and priorities. The collaboration between the client organisation, users and the supplier would be intensified by validating the suggested requirements in order to secure that the requested requirements and priorities based on the real business needs are being developed. This action would contribute to efficiency based on this study.
Regarding the time related capabilities of the client the results showed that the suppliers wish client organisations would increase the time allowed to agile activities. However this would require an access to influence the client organisations expectations, approach and attitude regarding software development, which will be further discussed in section 5.4. It was noted that if the supplier works according to the agile approach they should find out how much time and effort the client organisation is willing to allow for the development and then assess if it is possible to perform the project with an agile approach. Similar suggestion has been made in previous research where a risk-assessment was recommended to measure the level of client involvement up-front (Hoda et. al, 2011).

5.2. Power distributions in organisations

It has been said that in agile projects decisions have to be made quickly and they should be done by individuals who have the best ability and knowledge regarding the topic (Highsmith, 2002). Based on this study the setting of power distribution and decision-making processes vary between organisations. It was noted that in some organisations decision-making processes are slow or may base on wrong assumptions and delay the project by reducing development team efficiency. However, implications of more effective decision-making processes and agile project compatible power distribution in organisations could be identified. Especially in smaller organisations the different roles in the projects reflected the power distribution in the organisation. The interviewees mentioned that organisations where the complexity of design is understood and continuously worked with can reflect more suitable power distributions since the settings regarding e.g. decision-making are already in place. This was an interesting finding; however the author encourages researchers to study this assumption further.

A single supplier having an influence to the power distribution settings in organisations were not seen as probable. The interviewees mentioned that in order to be able to influence the decision-making capabilities the agile way-of –thinking should be strengthened in organisations. Suggestions of activities that would support decision-making of the decision-maker (in some cases the client representative) the suppliers can try to impact the speed or direction of the decisions in cases where their knowledge is valuable by providing information that can be useful for the decision-maker and help them to reach a decision that supports the organisations business and needs.
The author wants to encourage researchers to investigate organisational structures and how they limit agile development projects overall. Suggestions to perform further research in practice on reforming or removing structures from organisations or project teams have been expressed in previous studies as well. E.g. McAvoy and Butler (2009) propose that decision-makers should be challenged by examining and challenging the assumptions the decision-maker has regarding the decision. They also propose that the same technique should be tested in empowered agile teams. These further studies could provide knowledge on the benefits as well as risks of organisations performing in an agile culture. This knowledge could be further used when organisations consider shifting into an agile organisation in a greater context.

5.3. Availability of the client

The agile methodology encourages to continuous interaction (the Agile Manifesto, 2001) and also in previous research the importance of communication and interaction between the customer representative and developers has been emphasised and implications of successful communication contributing to project success has been mentioned (Holzmann and Panizel, 2013; Misra et al. 2009). In this study it showed that the availability of the client representative is tied to the workload they are assigned in the client organisation. Lack of time commitment would result in project delays or unnecessary work since the development team would not receive the required requirements, support and commitment from the client representative and which would eventually lead them to make assumptions regarding the next steps in the development. Similar findings have also been reported in previous studies.

For example Ramesh et al. (2007) mention effectiveness of communication between the client and the development team depending on factors such as client availability, client consensus and client trust which all could place challenges to required agile practices in a project. Ramesh et al. (2007) points out an interesting issue in their study regarding communication through a single client representative and the possible effect of it narrowing the interaction between the users and the developers. A similar comment regarding the user-developer communication was made in the study of this thesis which got the author pondering on a question of how the interaction between the users, customer representatives and the developers/suppliers in practice should be arranged in order to bring the maximum value to the project. As already mentioned in chapter 5.1 both suppliers and the clients (Ghodabi & Mathiassen, 2014) demand
increased interaction. However a higher level of interaction may affect the expectations of the developed software and the risk of a possible failure or dissatisfaction towards the software may increase (Subramanyam et al., 2010). Based on the previous literature regarding project environments and communications effect on software project success (Boehm, 2002; Mishra 2012) the author proposes that also the communication and interaction needs of a project could depend on the project environment and the established communication methods. However the author also proposes that interaction with the client representative is vital for an agile software project to succeed.

According to the results of this study the client representative’s lack of time for performing his tasks or agile activities affects his possibility of being available for the project. In the study of this thesis the reason for lack of time was expressed to be caused by other tasks that the project members or the client representative are expected to perform in the organisation. Also the client representative’s interest and willingness to participate in the project were mentioned to affect his availability according to the interviewees.

To ensure the client representatives engagement and time commitment in important meetings the interviewees suggested scheduling as an effective mean. Also the suppliers encouraging the client representative to participate in development, showing the client representative that their input is necessary for the project and encouraging the client representative to take part in events that could improve the trust between the supplier and the client representative were found important and was believed to affect the client representative’s interest towards the project.

5.4. Organisational expectations, approach and attitude towards software development

As was mentioned in the introduction of this thesis, implementing agile practices on an organisational level rather than on a team level has been claimed to be challenging (Abrahamsson et al. 2009). Uniform thoughts were also expressed in the study of this thesis. The challenges according to the interviews fall upon the overall expectations regarding the nature of software development, definite resources and contractual expectations in some organisations.
Based on the interviews there is a dissenting view towards software development between organisations and software suppliers. Although before taking this claim as a current definite, it should be confirmed by conducting a similar study regarding the organisational approach towards software development. However, it can be said that there is a demand for organisations implementing or at least supporting the agile culture of software projects according to both project management literature (e.g. Cobb, 2012) and the interviews performed in the study of this thesis. Topics that emerged in the interviews regarding dissenting approach to software development were the resource allocation often referred to time constraints and the workload of the client representative.

Regarding the implementation of agile practices and engaging organisations to support the agile practices required according to the interviews access to the higher levels of the organisation, possibly some experience in complex design and established interest in agile concepts. The desire of a wider introduction of agile to audiences was mentioned several times by the interviewees and drew the authors’ attention to consider the visibility of agile. Moreover the style and practices in which agile is introduced to business audience and how the visibility of agile could be improved and the attraction towards agile could be increased in organisations that operate in different business areas and therefore facilitate the access to the higher levels in organisations and the possible implementation of agile culture. However, the author also believes that the discussion of socio-cultural changes (discussed in Nerur et al., 2005) and different project environments as mentioned by Boehm and Turner (2005) should be highlighted in the discussions that aim to increase the visibility of agile in order for the understanding of complexity and premises different conditions may create for an agile project.

The suggested solutions that the interviewees found to affect the organisational expectations, approach and attitudes were trust building activities, demonstrating that the agile approach performs and adds value, engaging the organisation to agile approach and enhancing the openness to continuous improvement. The concrete suggestions for influencing on organisations expectations, approach and attitudes were training and role descriptions when access to higher levels is in place, proving that agile performs well and demonstrating how the development approach affects project costs. According to the interviews the suppliers also call for practicality in terminology when discussing agility in business in order to increase the practical understanding of agility
and also, overall improvement in organisations openness when striving to business efficiency.

Based on previous literature organisations suffer from insufficient resources for software solutions and their maintenance (Pass and Ronen, 2014). The research by Pass and Ronen (2014) suggests that the underlying problems are that organisations do not focus enough on activities that bring value to the organisation and also lack an effective IT resources management methodology. In this study it was mentioned that suppliers may be able to have an effect on the organisations expectation, approach and attitude towards software development if they can demonstrate that agile performs well and brings value to the organisation. It could be assumed that discussing value would be an effective mean to bring agile culture to organisations or at least encourage organisations to support the agile activities. However, abandoning traditional roles may be difficult, but as suggested role descriptions that promote the agile culture could increase the organisational understanding towards software development and perhaps even introduce an efficient working style in organisations. Shifting from traditional roles towards more efficient roles has been mentioned in the previous literature as well.

5.5. Summary

When summarising the results the author feels that this study resulted in three contributions. First, the study indicates that several problems and issues are experienced in agile software development projects and most of the issues hinder the efficiency factor which is considered one of the advantages of agile software development. Second, the study shows that suppliers have tackled the problems and issues by having activities and norms in place that engage the client in some extent to follow the agile culture in the project successfully. Third, the study substantiates that there is a demand for a greater visibility of the agile methodology that would be targeted to business audience in organisations.

The study regarding the limitations and problems experienced in agile software projects reflects the results of previous research; however, actions and techniques to overcome the limitations have not been studied as extensively. The main findings in this thesis are the proposed activities that prevent or overcome the found and studied problems and limitations in agile software projects in an environment that constitutes from a supplier and a business client (see table 4). Based on this study it can be confirmed that the proposed activities support the agile culture; however, the author
recommends further research to discover if the proposed activities actually result in greater efficiency since the nature of the study was explorative and efficiency could not be measured.

Table 5  Problems and proposed activities

<table>
<thead>
<tr>
<th>Problem/ limitation</th>
<th>Proposed technique</th>
</tr>
</thead>
</table>
| Insufficient knowledge of business needs  | • Involving real business experts and users in the development and requirements engineering  
|                                           | • Focusing on finding real business needs                                             
|                                           | • Fast validation through feedback                                                  |
| Power distribution in organisations       | • Access to higher organisational levels                                           
|                                           | • Demonstrate that agility performs well                                             |
| Availability of the client                | • The supplier provides support and coaching to the client representative            
|                                           | • Scheduling with the client                                                       
|                                           | • Closeness of the collaboration                                                   |
| Organisational expectations, approach and attitude | • Trust building activities between the client and the supplier                
|                                           | • Demonstrate that agility performs well                                            
|                                           | • Engage the organisation to agile                                                  
|                                           | • Openness to continuous improvement                                               
|                                           | • Fairness in contracts                                                            |

The author recommends the readers of this thesis would appreciate the connectivity of the results and categorisation of the issues and problems as well as the activities and techniques that are provided to solve the respective issues and problems. As it was discussed with the interviewees the level of client involvement in agile practices is influenced by several environmental factors that may be interconnected and therefore the solutions could also have an impact on several discussed issues as well. The author also wishes that this thesis would bring additional content to the on-going wide scale discussions regarding the implementation of agile in software development projects and encourage researchers and practitioners to involve in making efforts to increase the visibility of agile to business audiences.
6 CONCLUSION

The aim of this thesis was to present challenges; moreover, problems and issues that software suppliers experience regarding business client involvement in agile practices in software development projects. The second aim of this thesis was to provide techniques and solutions that could improve the client involvement in agile practices in software development projects. Based on the results of the study the author can note that the thesis has succeeded in exploring both themes and additionally addressed that there is a demand for increased visibility of agile to organisations and their business audiences according to software experts in Finland. The thesis presents challenges Finnish supplier practitioners find regarding the current engagement of business clients and how the suppliers endure with this collaboration and the challenges it may set on the agile approach they exploit in the development.

The methodological approach for this thesis was chosen to reflect the nature of the research questions. The aim of the study was to gain knowledge from practitioners and to attempt to identify themes from the collected data that are connected with the research questions. Although this thesis took an inductive stance the primary goal was not to build theories regarding the topic. Instead the aim was to conduct an exploratory study which would provide knowledge for further contributions in the field. The material for the study was collected by interviewing persons who had expert knowledge regarding the topic of the thesis.

Based on the analysis of the findings it can be said that problems and issues caused by the following categories are experienced by Finnish suppliers regarding client engagement that affect the agile practices:

- Insufficient knowledge of business needs,
- Power distribution in organisations,
- Availability of the client,
- Organisational expectations, approach and attitudes.

The main finding of this thesis is that Finnish suppliers have tackled the problems and issues by having activities and norms in place and that support the supplier to engage the client mainly on a team level to follow the agile culture in the project (activities presented in table 4, on page 62). These findings contribute to the practical field by introducing activities that suppliers can use to improve the performance of the agile approach in client organisations and also improve the understanding of suppliers’
expectations regarding client engagement in agile activities. Engaging clients on an organisational level to support the agile activities was found to be a difficult task; nevertheless, ideas and enthusiasm to tackle the issue could be identified on a professional level. For research field this thesis contributes by presenting several suggestions for further research that are discussed in the following section. However, it also fills a gap in research by introducing how problems that affect the agile approach could be countered or prevented.

The author recommends further research in areas such as the performance of knowledge sharing in agile environments in order to find out how the value of the interaction between the users, customer representatives and the developers/suppliers could be maximised and requirements engineering processes could be made more efficient; also, it would be beneficial to study the performance of agile culture and decision-making in smaller organisations as well as the overall implementation of agile in small organisations. The author also encourages researchers and practitioners to consider if value discussions, the visibility of agile and conventional terminology would improve the interest and acceptance of agile among organisational business audiences.
Inledning

Den snabba tekniska utvecklingen har ändrat mjukvaruutvecklarnas fokus från att skapa enstaka funktioner till att konstruera helheter d.v.s. datasystem som förenklar och effektiviserar verksamhetsprocesser hos företag eller hos organisationer. Dagens affärsomgivning utmanar systemutvecklarna att bygga informationssystem snabbt och på ett effektivt och flexibelt sätt. Dagligen möter systemutvecklarna utmaningar gällande t.ex. nya teknologier, användarnas föränderliga krav på datasystem och kraven att hastigt realisera ekonomiska fördelar av ett system (Boschetti et al. 2014).


Enligt senaste undersökningar i systemutveckling och agila metoder rekommenderar forskare att fortsatt forskning borde rikta in sig på att studera aktuella frågor och

**Motivering av studien**


I avhandlingen studerar jag agil systemutveckling i en utvald omgivning. Omgivningen utgörs av två organisationer, en klientorganisation och ett företag expert på systemutveckling. Den här fördelen är vanlig inom företag eftersom organisationer vanligtvis anser att det är viktigt att reagera på marknadsutvecklingen och att ständigt
förbättra sin kärnverksamhet genom att tillämpa expertis i olika verksamhetsprocesser (Kertzner 2009: 346). Fördelningen kan dock förorsaka problem i fråga om kommunikation, kontroll och förtroende mellan medlemmarna i projektteamet och klientföretaget (Ramesh et al. 2006). Dylika problem kan vara skadliga för agil systemutveckling.

För att kunna förbättra samarbetet mellan klientorganisationer och systemutvecklingsföretag är det värdefullt att studera vilka de aktuella konkreta problemen i agila systemutvecklingsprojekt är och varför problemen uppstår. Därtill är det viktigt att studera hur problemen borde lösas eftersom tidigare studier inte har gett något svar på hur problemen kunde lösas eller avstyras.

Syfte

Syftet med avhandlingen är att analysera varför det uppstår problem i agila systemutvecklingsprojekt där omgivningen utgörs av en klientorganisation och en systemutvecklingsleverantör och hur de eventuella problemen kunde lösas. Syftet uppnås genom att studera vilka problem systemutvecklarna stöter på när det gäller klienternas medverkan i agila systemutvecklingsprojekt samt vilka alternativa åtgärder de vidtar för att lösa problemen. Avhandlingen undersöker endast systemutvecklarnas synpunkter eftersom kunskap i det agila betraktelsesättet är av yttersta betydelse för att kunna svara på de ovan ställda frågorna.

Avhandlingens forskningsfrågor är:

FF1: Varför uppstår det problem i agila systemutvecklingsprojekt där omgivningen utgörs av en klientorganisation och en systemutvecklingsleverantör?

FF2: Hur agerar leverantörerna inför olika problem som uppstår inom agila systemutvecklingsprojekt?

Min avhandling vill ge svar på den praktiska tillämpningen av det agila betraktelsesättet och uppmåna forskare till fortsatt forskning kring avhandlingens tema. I den teoretiska delen av avhandlingen diskuterar jag kring följande frågor: Hur utmanande är det att tolka termen agil? Vilka aktiviteter borde en klient delta i i ett agil utvecklingsprojekt? Varför är klientens engagemang viktigt i agila systemutvecklingsprojekt? Hurdana problem har rapporterats i agila systemutvecklingsprojekt i tidigare studier?
Den empiriska delen visar på konkreta problem som uppstår på grund av klienternas bristande engagemang i agila aktiviteter och ger även förslag till hur problem av det här slaget kan lösas.


Presentation av tidigare forskning


Litteratur som behandlar agil systemutveckling konstaterar att det är en fördel att ta kunden med i utvecklingsprocessen. På detta sätt får utvecklingsteamet en bättre bild av kraven och behoven som är viktiga för kunden och användartillfredsställdelsen gentemot produkten ökar (Cockburn 2002: 179; Kujala 2003). Utmanande för klienten är att det finns flera aktiviteter som denne i praktiken måste delta i under utvecklingens gång och även att projektomständigheterna måste vara gynnsamma för att utvecklingsprocessen skall motsvara ramverket för den tillämpade agila metoden. T.ex. i scrum, en agil systemutvecklingsmetod utvecklad av Ken Schwaber och Jeff Sutherland, måste klienten kunna kartlägga och prioritera klientorganisationens behov och kriterier för det utvecklade systemet (Schwaber och Sutherland 2013). Det betyder...
att klienten måste delta i olika möten för att kunna garantera att utvecklingen är på rätta spår, vara tillgänglig för utvecklingsteamet och vara redo att svara på eventuella frågor och kunna fatta beslut i aktuella ärenden för organisationen (Schwaber et al. 2012:139). Tidigare forskning visar att klientrepresentanter klarar uppgifterna med varierande framgång och att de inte engagerar sig tillräckligt i aktiviteterna inom agila systemutvecklingsprojekt (Sverrisdottir et al. 2014).


Val av forskningsmetod

Då syftet med min avhandling är att studera ett fenomen som uppkommer i praktiken och då det inte finns någon grundlig teori för fenomenet valde jag en induktiv forskningsansats. Med den induktiva forskningsansatsen borde forskaren kunna bygga en teori kring det studerade fenomenet (Bryman och Bell 2011: 13). Det är dock viktigt att notera att jag inte kommer att presentera någon fullständig teori i den här studien utan syftet är att utöka kunskapen i det studerade ämnet för vidare undersökningar.

Forskningsdesignen jag valt är kvalitativ eftersom studien grundar sig på de erfarenheter personer med expertkunskap har i ämnet. Det finns ett fåtal studier i klientengagemang i agila metoder och de flesta av dem behandlar endast problem som är förorsakade av otillräckligt klientengagemang i agila aktiviteter. Forskning om konkreta lösningar till olika problem saknas och av den anledningen har jag valt att utföra en explorativ studie.

Datainsamlingen sker genom att intervjua systemutvecklingsexperter som har praktisk kunskap i agil systemutveckling. I explorativa studier är intervjuerna oftast ostrukturerade men jag valde att utföra halvstrukturerade intervjuer eftersom de fokuserar på i förväg bestämda teman och för att intervjuutiden på så sätt används effektivt (Bryman och Bell 2011: 467; Bernard 2013: 183).


Intervjuerna bandade jag och transkriberte dem därefter till textdokument. Vid analysering av data återgick jag till att lyssna på inspelningarna för att ta fasta på vad informanternas betonade under intervjun. Då alla intervjuer var gjorda stod analysen av data i tur. Det viktigaste med data-analysen var att identifiera olika teman (problem och lösningar till dessa problem) och därför valde jag att använda en innehållsanalys där man bygger kategorier för olika svar och sedan placerar svar med samma innehåll inom motsvarande kategori (Silverman 2001: 64). Först analyserade jag de problem som förekom gällande klientens engagemang i agila systemutvecklingsprojekt och
förklarings till problemen och därefter analyserades jag lösningar till dessa problem som informanterna identifierade under intervjuens första tema (se appendix 1).

**Resultatredovisning**

De empiriska resultaten ger vid handen att problem, när det gäller klientens engagemang i agila aktiviteter i agila systemutvecklingsprojekt där projektomgivningen utgörs av en leverantör och en klientorganisation, förorsakas av följande faktorer:

- Otillräcklig kunskap om behoven inom affärslivet
- Maktplaceringen i klientorganisationer
- Klientens tillgänglighet och
- Klientorganisationens förväntningar, inställning och attityd till systemutveckling.


För att lösa de problem informanterna efterlyser föreslår informanterna att flera experter från affärslivet tas med i utvecklingen istället för att endast en klientrepresentant skulle vara ansvarig för kartläggning av affärsbehoven. Informanterna ansåg dessutom att projektteamet borde fokusera på att hitta de ”rätta” affärsbehoven och att man borde validera behoven hos experterna eller användare så fort som möjligt för att onödigt arbete skulle minimeras.

Effektiviteten i agila projekt försämrades även på grund av maktplaceringen i klientorganisationerna. Att klientrepresentanten inte kunde fatta beslut i ett agilt projekt upplevdes ansträngande eftersom risken för att utvecklingsarbetet skulle avstanna då ökade. Informanterna ansåg att leverantören inte kan påverka maktplacingen i klientorganisationen. De påstod dock att i vissa organisationer är maktplaceringen inte ett problem eftersom organisationer som förstår sig på komplexa designprocesser reflekterar maktplacingen i agila team.
På basis av informanternas kommentarer är klientrepresentantens tillgänglighet bunden till mängden arbete hen förväntas utföra i klientorganisationen. Tidsmässiga brister ledde oftast till att projektet blev födröjt och att mängden onödigt arbete utökades i utvecklingsteamet eftersom prioriteringar, krav och feedback inte kommunikerades i tillräckligt hög grad till utvecklingsteamet. Liknande anledningar har rapporterats även i tidigare studier (t.ex. Ramesh et al. 2007). Även klientrepresentantens intresse för projektet ansågs påverka tillgängligheten.

Alla informanter insåg vikten av att ställa upp en tidtabell tillsammans med klientrepresentanten för att garantera deltagande i viktiga möten. Dessutom konstaterade flera informanter att klientrepresentanten måste känna sitt värde i utvecklingsteamet, d.v.s. att klientrepresentantens insats i projektet är betydande. Enligt de intervjuade uppnår man detta genom att uppmuntra klientrepresentanten att delta i olika möten och evenemang där man bygger upp förtroendet mellan teammedlemmarna.


För att kunna påverka organisationen konstaterade informanterna att leverantörerna borde ha tillträde till högre nivåer inom klientorganisationer. Informanterna ansåg att fördelarna av det agila betraktelsesättet borde diskuteras även i allmänhet. Detta skulle möjligen öka affärspublikens intresse och förståelse för agila aktiviteter. Informanterna rekommenderade att för att kunna påverka klientorganisationens förväntningar, inställning och attityd till systemutveckling och engagera dem till agila aktiviteter borde leverantörerna försöka utbilda organisationen genom roldeskriptioner och genom att visa att agila aktiviteter hämter värde och tillför större effektivitet med mindre kostnader till projektet. Därtill nämndes att man kunde utvidga kunskaper i det agila betraktelsesättet i affärsorganisationer genom att diskutera betraktelsesättet i praktiska
termer och genom att visa att metoderna kan användas även utanför systemutveckling. Dessutom ansåg informanterna att organisationerna borde vara mer öppna för förändringar i processer och även i fråga om omgivningen, detta för att kunna uppnå effektivitet och framgång i verksamheten.

Avslutning

Avhandlingen har presenterat olika klientrelaterade problem och dessutom lösningar till dessa problem när det gäller agil systemutveckling. Man kan dra slutsatsen att avhandlingen bidrar till fortsatt forskning och även i praktisk agil systemutveckling, och det på tre olika sätt. För det första kan man på basis av studien konstatera att klientrelaterade problem i agila systemutvecklingsprojekt oftast leder till förminskad projekteffektivitet. För det andra visar studien att leverantörerna använder olika tekniker för att kunna engagera klienten till att i praktiken följa och stödja det agila betraktelsesättet. För det tredje påvisar avhandlingen att leverantörerna kräver att det agila betraktelsesättet borde diskuteras bland allmänheten och i praktiska termer för att väcka affärspublikens uppmärksamhet.

Metoden som användes i studien var en kvalitativ forskningsmetod med en induktiv forskningsansats. Undersökningen utfördes genom att intervjua sex experter inom systemutveckling för att utreda deras kunskaper och erfarenheter i fråga om temat.

På basis av analysen och resultaten kan man konstatera att klientrelaterade problem i agila systemutvecklingsprojekt uppkommer på grund av följande faktorer: otillräcklig kunskap om behoven inom affärslivet, maktplacering i klientorganisationer, klientens tillgänglighet och klientorganisationers förväntningar, inställning och attityd till systemutveckling. Dessutom kan man konstatera att leverantörerna kan lösa vissa problem genom att introducera aktiviteter som stödjer det agila betraktelsesättet för klienten. Att engagera organisationer till att stödja agil systemutveckling ansågs vara svårare. Dock kunde man identifiera idéer och entusiasm för att kunna påverka organisationers förväntningar och attityder till systemutveckling.

I framtida forskning kunde man studera t.ex. kunskapsöverföring och dess effektivitet i agil omgivning och olika sätt att maximera värden av interaktionen mellan klienten och leverantören. Dessutom kunde man studera om affärspublikens intresse för agila aktiviteter i organisationer skulle öka ifall det agila betraktelsesättet och dess aktiviteter och normer diskuteras i praktiska termer.
REFERENCES


APPENDIX 1 INTERVIEW GUIDE IN ENGLISH

INTERVIEW GUIDE

The background of the interviewee

1. What type of experience do you have in agile software development practices?
   a. Do you use agile software development practices at work?
   b. Which methods do you have experience in?
   c. In what type of activities are you involved in? What is your job description in projects?

2. What type of experience do you have of working with client?
   a. What is the role of the client in the projects you have been involved in? (PO, user, shareholder)

What type of problems and issues occur in software development when the business client does not engage the agile approach and activities recommended by the supplier?

3. What type of problems have you encountered with and how did they emerge?
   Assisting topics:
   Have you encountered the following issues?
   a. Communication and requirements mapping
      i. Insufficient user-developer interaction
      ii. Vague requirements mapping from the client
      iii. Insufficient engagement in the agile activities e.g. meetings regarding upcoming release (retrospective)

   b. Availability and engagement
      i. The client does not have the required experience and knowledge in his/hers role in the project
      ii. The client is not available enough
      iii. The client does not support the agile approach through the project tasks
c. Contract specification and the complexity of the development
   i. The client wants specified contracts
   ii. The client strives to determine the cost and timetable of the project

d. Differentiating organisational cultures
   i. The client expresses mistrust in the agile approach
   ii. The higher management influences the agile activities and strive to apply traditional planning based development

4. Why do you believe these problems occur?
5. Where do these problems you mentioned lead to?
6. Have you experienced the same issues and problems in several projects?

**How can we (suppliers) increase the business client’s knowledge and engagement in agile practices?** (we shall discuss the problems you mentioned in the previous topic)

7. Have you used any specific concrete methods or practices?
8. What type of practices do you think would be useful? Practices that you have not used yet or have not been able to apply.

Assisting topics:
   a. Do you believe that creating shared goals with the client or the mutual understanding regarding the project expectation could increase the client’s motivation towards the agile approach?
   b. Do you believe that tools that have been said to improve communication could improve the communication between the supplier and the client?
   c. Do you believe that external consultants of agile coaches could improve the client engagement in agile practices?

9. Do you have any other topics you would like to discuss or bring up?
APPENDIX 2  INTERVIEW GUIDE IN FINNISH

HAASTATTELUOPAS

Haastateltavan kokemus

1. Millaista kokemusta sinulla on ketterien menetelmien käytännöistä?
   a. Käytätkö menetelmiä työssäsi?
   b. Mitä menetelmiä käytät?
   c. Millaisissa aktiviteeteissa olet mukana? Mikä on työnkuvasi projekteissa?

2. Millainen on kokemuksesi asiakkaiden kanssa toimimisesta
   a. Mikä on asiakkaan rooli projekteissa joista sinulla on kokemusta (PO, user, shareholder)

Millä tavoin asiakkaan tiedon tai sitoutuneisuuuden puutteellisuus ketterien menetelmien käytännöissä ilmenee?

3. Millaisia ongelmia sinä olet kohdannut ja kuinka ne ovat konkreettisesti tulleet esille?
   Apu-/jatkokysymyksiä:
   Oletko kohdannut seuraavia ongelmia
   a. Kommunikointi ja tarpeiden kartoitus
      i. Riittämätön käyttäjä-kehittäjä vuorovaikutus
      ii. Epäselvä tarpeiden ja vaatimusten kartoitus asiakkaan puolelta
      iii. Puutteellinen osallistuminen ketteriin aktiviteetteihin, esimerkiksi kokouksiin joissa keskustellaan tulevasta julkaisusta (retrospektiivi)

b. Saatavuus ja sitoutuneisuus
   i. Asiakas ei omaa riittävää kokemusta ja osaamista roolistaan projektissa
   ii. Asiakas ei ole saatavilla riittävässä määrin
   iii. Asiakas ei muokkaa projektiin liittyviä tehtäviä tehtäviään sopimaan ketterien käytäntöjen kanssa
c. Sopimusten suunnittelu ja kehitystyön monimutkaisuus
   i. Asiakas pyrkii tarkoin määritettyihin sopimuksiin
   ii. Asiakas pyrkii määrittämään kustannukset ja projektin keston

d. Eriävä organisaatiokulttuurit
   i. Asiakkaan epäilyks ketä menetelmän toimivuudesta
   ii. Korkeamman johdon sekaantuminen ketäntöihin ja pyrkimys viemään käytäntöjä perinteisempään suunnittelupohjaiseen suorittamiseen

4. Mistä luulet ongelmiin johtuvan?
5. Millaisi olettuloksiin mainitsemasi ongelmat ovat johtaneet?
6. Oletko kokenut samoja ongelmia eri projekteissa?

Millä tavoin voimme lisätä asiakkaan tietoisuutta ketteristä menetelmistä ja aktiviteeteista joissa heidän osaamista ja osallistumista tarvitaan? (lähetetään ajattelemaan niiden ongelmien kannalta joita mainitsit koskien edellistä teemaa)

7. Onko jotain tapoja/menetelmiä joita itse käytät/olet käyttänyt?
8. Onko jotain tapoja/menetelmiä mitä et ole käyttänyt, mutta uskoisit olevan hyödyksi?

Apu-/jatkokysymykset:
   a. Uskotko että molemmiluolin projektiodotusten ymmärrys tai yhteisten tavoitteiden luominen voisi lisätä asiakkaan motivaatiota ketteriä menetelmiä kohtaan?
   b. Uskotko että kommunikaatiota parantavat työkalut voisivat parantaa kommunikaatiota teidän ja asiakkaan välillä?
   c. Uskotko että ulkopuolisten konsulttien tai ketterien valmentajien tuominen mukaan projekteihin parantaisi asiakkaiden aktivoitumista ja sulautumista ketteriin käytäntöihin?

9. Onko sinulla mielessä muita aihepiirejä joita haluaisit nostaa esiin tässä keskustelussa?