Master's thesis

NTNU
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Agile coaching in Norway and the USA

The role of the agile coach in teamwork, organisational culture and leadership

Master's thesis in Work and Organisational Psychology
Supervisor: Karin Laumann
May 2020

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This master's thesis symbolises the end of my studies at the Norwegian University of Science and Technology. In this relation, I wish to thank people whose support was central for this thesis to be completed and even possible.

First of all, I would like to express my appreciation to the Department of Psychology at NTNU for the opportunity to study Work and Organisational Psychology. It is a fantastic study program where I have received precious insights into how psychology can be applied at the workplace.

I would also like to thank Kristin Wulff for connecting me to the research group Digital Process Innovation at SINTEF. This connection was decisive for my choice of the current topic and gave me a unique chance to collaborate with Nils Brede Moe and Viktoria Stray as co-supervisors of this thesis. Nils and Viktoria deserve special thanks for allowing me to be a temporary part of their research project. Their guidance, experience and enthusiasm were essential for this study's completion. They provided me with both academic, professional and personal support throughout the whole project, which I am really grateful for.

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Anastasiia Tkalich
Trondheim, 27th of April 2020

Sammendrag

Smidig coaching har nylig blitt innført for å støtte suksessfull anvendelse og bruk av smidige metoder i programvareutvikling. Imidlertid jobber smidige coacher med problemstillinger som også hører til arbeidspsykologi, blant annet teamkommunikasjon, arbeidsmiljø og ledelse. Formålet med denne studien er å beskrive hvordan smidig coaching er praktisert i Norge og USA. Femten kvalitative intervju med nåværende smidige coacher ble analysert gjennom en induktiv tematisk analyse, noe som resulterte i tre temaer: *teamarbeid, forretningsagilitet* og *bedre produkter*. Den tematiske strukturen er sammenlignet på tvers av landene. Oppgaven tar utgangspunktet i organisasjonspsykologisk litteratur for å drøfte hvilken rolle smidige coacher spiller i teamarbeid, organisasjonskultur og ledelse. Det er foreslått at smidig coaching kan forbedre teamarbeid gjennom å fremme teams interne koordineringsmekanismer. Det viser seg også at smidig coaching transformerer organisasjonskultur i tråd med prinsippene i smidig programvareutvikling. I tillegg, forsøker smidige coacher å støtte transformasjonsledelse, noe som kan være en god basis for smidig metodikk. Sammenligning av praksisene på tvers av landene tyder på at norske smidige coacher fokuserer mer på arbeidsmiljø enn deres amerikanske kollegaer, og at de samtidig bruker mindre tid på å trene ledere og kunder. Organisasjoner som ønsker å lykkes i å anvende og bruke smidig metodikk, anbefales å gi de smidige coachene tilstrekkelig påvirkning på konteksten rundt team. Norske smidige coacher kan dra nytte av å øke oppmerksomheten mot ledere og kunder.

Abstract

Agile coaching is a recently-emerged activity that is meant to promote successful implementation and use of agile methods of software development. However, agile coaches address issues that also lie within the field of organisational psychology, such as interaction in teams, organisational environment and leadership. The purpose of this study is to describe how agile coaching is practiced in Norway and the USA. Fifteen qualitative interviews with current agile coaches were analysed through an inductive thematic analysis and three overarching themes were identified: *teamwork*, *enterprise agility* and *better products.* The resulting thematic structure is compared across the informants from Norway and the USA. The thesis applies organisational psychology literature to discuss what role agile coaches play in teamwork, organisational culture and leadership in their organisations. It is suggested that agile coaching has the potential to improve teamwork by facilitating coordination mechanisms within teams. Moreover, it appears to transform organisational culture in line with agile principles. In addition, agile coaching seems to promote transformational leadership that is argued to be compatible with agile software development methods. The comparative analysis indicated that Norwegian agile coaches pay more attention to the quality of organisational environment than their American colleagues, while at the same time being less focused on coaching managers and customers. Companies who wish to successfully apply and use agile methods are recommended to give their agile coaches sufficient authority to influence context of the teams. Norwegian agile coaches are recommended to increase the amount of attention they pay to managers and business partners.

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Preface

This study is a part of a bigger research project conducted by SINTEF Digital. Data collected specifically for this project constituted approximately half of the current data material. These are qualitative interviews primarily with informants from the USA that were collected by my co-supervisors from SINTEF, Nils Brede Moe and Viktoria Stray. The rest of the data material was collected by me and consists of interviews with Norwegian informants. The data collection strategy (e.g. content of the interview guide and number of the informants) was formulated in collaboration with SINTEF.

The general idea of this study belongs to my co-supervisors, whereas I was the one who formulated the purpose of the study and the research question. I was also responsible for the transcription of all interviews, the data analysis and its subsequent interpretation. The whole text of this thesis was written by me.

Anastasiia Tkalich,
Trondheim, 27th of April 2020

Introduction

The phenomenon of *agile coaching* in today's technological organisations has attracted the attention of researchers from the field of software engineering (O'Connor & Duchonova, 2014; Rodriguez et al., 2016). At the same time, agile coaches appear to work with subjects that also lie within the interests of organisational psychologists: they improve collaboration in development teams, motivate individuals, guide leaders, and promote new organisational attitudes and habits (Bäcklander, 2019; O'Connor & Duchonova, 2014). The initial purpose of agile coaching is to support teams and organisations who wish to adopt and successfully use a particular model of software development, generally referred to as *agile methods*. Face-to-face interaction, collaborative decision-making and trust are at the core of these methods (Fowler et al., 2001), which makes *agile coaching* more a psycho-social than a technological phenomenon. Nevertheless, it has not yet been studied from an organisational-psychology perspective.

"Agile coach" is now the official name of a position that brings up more than 10 000 results from around the world when searched for on LinkedIn. The organisational interest in this role has been increasingly high ever since the success of agile coaches in the Swedish-based company Spotify, where they contributed to the personnel's autonomy, interpersonal interaction and technological innovation (Bäcklander, 2019). At the same time, there is high demand among knowledge organisations to adopt and apply *agile methods* (Carroll & Conboy, 2019; Fuchs & Hess, 2018), which creates an additional need for agile coaching. This together makes the role of agile coach an attractive subject for research, yet empirical knowledge about it is still scarce. In addition, the existing literature appears to lack theoretical understanding of how agile coaching impacts teams and organisations.

The current study seeks to fill this gap by both giving an empirical account of agile coaching and offering a theoretical perspective on this role from the perspective of organisational psychology. Specifically, it examines whether agile coaching can have an effect on the quality of teamwork, organisational culture and style of leadership. Bringing together the two independent streams of literature, this study attempts to provide an interdisciplinary insight that will be beneficial both for software engineering and for occupational psychology. The suggested theoretical foundation can guide further research within agile coaching and use of agile methods, whereas the psychological theory acquires examples of how its concepts can be applied in current technological organisations.

An additional contribution of this study is that it examines agile coaching practices in Norway, something that has never been studied before. These practices are analysed in their relation to similar practices in US companies, thus providing a unique insight into possible cultural differences in agile coaching between Norwegian and US-based practitioners. This leads me to the explicit statement of this study's research question.

Purpose of the Study and Research Question

The purpose of this thesis is to describe how agile coaching is practiced in Norway and the USA and to discuss the meaning of this role from the perspective of organisational psychology. The study examines the following research question: *which role do agile coaches play in teamwork, organisational culture and leadership?*

Structure of the Thesis

The manuscript contains five chapters, including empirical and theoretical background, method, results, discussion and conclusions. The first chapter introduces agile coaching and *agile software development,* along with theoretical frameworks associated with teamwork, organisational culture and leadership. In the next chapter, I describe the research methods and procedures that were adopted in this study. In the Result chapter, I present the discovered themes with quotes that illustrate how agile coaching is practiced both in Norway and the USA. In the discussion, I examine what my findings have to say for the empirical knowledge about agile coaching and how they can be understood through the prism of organisational psychology. I also discuss possible differences in agile coaching in both countries and give practical advice based on the results. I suggest directions for further research and address the study's strengths and limitations, before coming to the final conclusions.

Empirical and Theoretical Background

Agile coaching is becoming increasingly popular in software development teams and organisations. However, there is little knowledge of how exactly it is practiced. The existing empirical findings are not insufficiently anchored in the theoretical literature. This chapter first introduces *agile software development*, which is essential for understanding the concept of agile coaching. In the second part of this chapter, I will suggest several organisational-psychology theories that can be used to understand how agile coaching can impact teamwork, organisational culture and leadership. Additionally, I present some traditional differences in work life that characterise Norway and the US in order to establish the foundation for comparative analysis of agile coaching in these two countries.

Agile Software Development

In order to understand agile coaching, one first needs to understand the principles behind agile software development and concrete methods of work. This sub-section explains those principles and methods that are essential for introducing the main concept of this thesis; *agile coaching*.

Agile principles. *Agile software development* is a set of work principles that have been created by experienced software developers. The agile principles are often compared to the principles of lean in that they also seeks to reduce time waste, integrate customer-supplier relationships and manage change within product development (Conboy & Fitzgerald, 2004). The agile principles are general guidelines for how developers should collaborate to create good software products. These principles have been extremely influential among software engineering practitioners after they were summarised in the Agile Manifesto almost 20 years ago (Fowler et al., 2001). Their increasing popularity resulted in something that can be called "the agile movement" (Dikert et al., 2016, p. 88) that led companies of different sizes to work according to the recommendations of the Agile Manifesto.

The majority of the principles describe how developers should interact with each other and the customer. They also outline a model of workflow for software development. In this way, the agile principles combine both psycho-social and technical aspects of work, which makes them interesting to study from an organisational-psychology perspective. Examples of the principles from the Manifesto that I have chosen to highlight are *face-to-face communication, building a supportive environment for motivated individuals*, *daily collaboration between developers and "business people"* and *delivering working software frequently* (Fowler et al., 2001). I will now shortly explain the meaning of these principles (all 12 principles can be found in Appendix A)

***Face-to-face communication*.** Face-to-face communication is considered to be the most efficient and effective way to convey information in a software development team (Fowler et al., 2001). A team is, in turn, a foundation of agile methods. It is therefore recommended to work in co-located teams that can freely interact. Ideally, these teams should be self-organised, since teams who can make decisions themselves are assumed to respond better to rapidly changing software requirements (Hoda et al., 2013). Such development teams are also recommended to regularly reflect on how to become more effective, and make the required changes (Fowler et al., 2001).

Building a supportive environment. Agile framework also encourages the building of trustful work environments that will give individuals sufficient support "to get the job done" (Fowler et al., 2001). Management in agile teams is contrasted to the traditional command-and-control management style, since it trusts the teams to perform to their best potential and understands the importance of teams' autonomy. Management is also supposed to be focused on individuals' talents and skills to help them develop (Cockburn & Highsmith, 2001).

Daily collaboration between developers and "business people". Teams are recommended to work in the same place (co-location approach) and to have short daily planning sessions together (Schwaber & Sutherland, 2017). In this way they make sure their work is synchronised or "agile". The planning process should be performed in close collaboration with the customer or "business", who should provide constant feedback to the development team (Hoda et al., 2013). Daily collaboration allows team to adjust software in a timely way to possible changes in the customer's preferences. This is why agile teams often have a customer representative "on-site" who is available for discussing those preferences (Dybå & Dingsøyr, 2008).

Delivering working software frequently. According to the Agile Manifesto, working software is the primary measure of success (Fowler et al., 2001). Teams are recommended to deliver small fragments of software frequently, "from a couple of weeks to a couple of months" (Fowler et al., 2001). This model allows to create a better fit with the customer's expectations and is thus more resource-efficient. Frequent deliveries or "iterations" in agile software development can be contrasted with more traditional models, where fully specified software is delivered after a long period of time (e.g. after one year) (Dybå & Dingsøyr, 2008). If the client is not satisfied with the product, the cost of making changes increases and the changes can be more dramatic. If the software is delivered frequently in small portions, the customer can provide timely feedback on each portion while the development team can

quickly incorporate it. In this way the final product is more adjusted to customer's needs than those made by means of traditional development.

Agile methods: clarification of terms. The agile principles have given rise to concrete methods of agile software development. *Scrum* is among those often applied in today's digital organisations (Hamed & Abushama, 2013). *Scrum* can be seen as a project management framework within agile software development that prescribes certain roles and rituals which should characterise the software development process (Schwaber & Sutherland, 2017). Given the prevalence of this method and its terminology among the participants of this study, I will now describe some concepts from it based on the Scrum Guide created by Schwaber and Sutherland (2017).

Self-organising team. According to the Scrum Guide, software development teams should be *self-organising*, meaning that they are the only ones to decide how exactly they develop the required software features. Self-organising teams receive support from *Scrum Master* and *Product Owner* in planning the work, decision-making and coaching in self-organised teamwork.

Product Owner. The *Product Owner* is someone who is solely responsible for the value of the final product and communication between the team and the customer. The *Product Owner* converts the requirements of the client into concrete work tasks for the team. In collaboration with the client, this person also decides which features of the software should be developed during the current *sprint,* thus ensuring prioritisation of the tasks.

Scrum Master. The goal of the *Scrum Master* is to maximise the performance of both the team, the Product Owner and the organisation. The person in this role can ensure that the team understands the tasks formulated by Product Owner. The Scrum Master also conducts the agile ceremonies (such as *stand-up* and *retrospective*, described below) and coaches teams in self-organisation. In addition, they should coach the organisation in how to function in order to increase the productivity of the agile development team.

Sprint. A Scrum *Sprint* is a time-frame within which the software development work is performed. A *sprint* can last from one week to one month.

Stand-up. Each day of a sprint normally starts with a 15-minute meeting (*Daily Scrum* or *stand-up*) where the team collectively plans what it will work on for the next 24 hours.

Retrospective. *Retrospective* is a ritual that is recommended at the end of each sprint as a means to reflect on the team's performance and interaction. As a result of the retrospective, the team may agree on improvements in teamwork and workflow that should be made during the next sprint.

Now that the main concepts of agile methods have been outlined, it is possible to build on this to introduce *agile coaching*.

Agile coaching. The terms *agile coach* and *Scrum Master* were until recently used interchangeably (Hoda et al., 2011). The purpose of the both roles is to maximise teams' performance by training them in agile principles, values and practices (Hoda et al., 2011). However, the role of agile coach began to be differentiated from that of Scrum Master after the attention the former received through Spotify, where it became less associated with the Scrum framework and more with teamwork, performance and leadership (Bäcklander, 2019).

Since all agile software development methods are based on teamwork in self-organising teams, team coaching has become essential. The goal of an agile coach is to increase teams' capability to attain a higher level of accomplishment and is thus no different from that of a regular team coach (DeRue et al., 2010). The difference is, however, that agile coaches achieve this goal by using methods from the agile repertoire, such as *retrospective* meetings that allow team members to reflect on their performance or personal interaction. This role may be compared to that of a team leader in that an agile coach may stimulate a team's problem-solving, reinforce desirable behaviour and motivate individual team members (Rousseau et al., 2013). The crucial difference, however, is that an agile coach is not actually managing the team but is rather seeking to increase its self-organisational skills (Hoda et al., 2013). Agile coaches can be either hired consultants or existing project managers who take up a coaching role (Hoda et al., 2011).

Bäcklander (2019) makes a distinction between agile coaches who work with software teams and regular executive coaches who train management and executive teams on leadership style and personal development. Agile coaches are thus known primarily as team coaches and not organisational coaches. Some findings, however, indicate that organisations which want to adopt agile methods may generally benefit from agile coaching. Based on a literature review of 52 papers, Dikert and colleagues (2016) concluded that coaching was one of the major success factors for companies implementing agile methods. Qualitative interviews with 49 agile practitioners from 13 countries revealed that agile coaches guided managers, collaborated with HR departments and motivated customers to work in an agile way (Parizi et al., 2014). The impact of agile coaches is generally perceived as beneficial by the companies who adopt them (O'Connor & Duchonova, 2014). At the same time, a lack of agile coaching appears to impair implementation of self-organising teams (Paasivaara et al., 2018).

Earlier findings suggest that agile coaches may be beneficial to organisations who wish to introduce agile methods. Such help may be useful, considering that the implementation of agile framework is often challenging for the organisations that adopt it. Dikert et al. (2016) reported 35 common barriers that hinder the introduction of agile methods, such as hierarchical management, lack of interaction between teams, lack of investment and general resistance to change. These and similar challenges can explain why some companies choose to abandon agile methods before they are able to gain benefits from them (Carroll & Conboy, 2019).

It appears that agile coaching is beneficial for both teams and organisations who want to work according to agile software development methods. However, empirical accounts of how agile coaching is practiced in various contexts remain limited. Besides, a theoretical framework for understanding the impact of this role is lacking. The current study seeks to fill this gap by looking at agile coaching from the perspective of organisational psychology. Later in this chapter, I introduce a number of frameworks which, I believe, may provide a theoretical understanding of agile coaching and its effect on teams and organisations. These frameworks address teamwork, organisational culture and leadership. Since this study addresses agile coaching in both Norway and the USA, I additionally present literature on some cultural differences in work life between these two countries.

Teamwork and Team Coaching

One purpose of agile coaching is to improve teamwork quality in software teams. Therefore, I will now introduce a framework that describes components of successful teamwork, which is followed by a model of team coaching.

A theory of components in successful teamwork. *Teamwork* can be generally seen as a set of interrelated behaviours, thoughts and feelings of team members that interact in order to collectively coordinate the achievement of task objectives (Salas et al., 2005). A *team* is, in turn, an identifiable group of employees who have shared tasks and who operate in the context of their parent organisation (Hackman & Wageman, 2005). According to a theory of teamwork proposed by Salas et al. (2005), any team effort has five components that should be coordinated by three fundamental mechanisms. I will now draw on Salas et al. (2005) to present both the components and the coordinating mechanisms. I give special attention to the latter, because agile coaches seem to particularly target coordinating mechanisms of the teams.

The "Big Five" of teamwork. Salas et al. (2005) propose that teamwork requires five necessary components, which they called the "Big Five" in teamwork: *team leadership,*

mutual performance monitoring, back-up behaviour, team orientation and *adaptability.* I will now briefly describe these components in order to explain what is a successful teamwork.

The role of *team leadership* is to guide and structure teamwork. Team leaders should set expectation for team performance and track abilities of individual team members. *Mutual performance monitoring* refers to team members' ability to improve each other's performance through mutual feedback. This component of teamwork is especially important when a team is engaged in stressful tasks. Overloaded team members are likely to make errors and can therefore benefit from others' corrective feedback. *Back-up behaviour* should arise when a team member is not able to succeed in his or her individual task. In this case, others should provide assistance in the form of guidance or completing the problematic task instead of the initial team member. Back-up behaviour often requires *team orientation*, which is team members' willingness to improve each other's performance. Finally, *adaptability* refers to a team's utilisation of resources that allows it to readjust according to the situation. Priest et al. (2002) argues that adaptive teams successfully cope with *team stressors*, such as time pressure and workload. It is also proposed that adaptability can be increased by coaching teams in shared mental models and by providing feedback on the work process (Priest et al., 2002).

Coordinating mechanisms of teamwork. According to Salas et al. (2005) any team requires three fundamental mechanisms in order to successfully coordinate the teamwork: *shared mental models, closed-loop communication* and *mutual trust. Shared mental models* refer to team members' ability to understand their common goal and the individual tasks each member needs to perform in order to achieve it. Team members with shared mental models correctly identify each other's roles and can rely on each other's performance. The results of one meta-analysis indicate that a shared understanding of the situation in the team is strongly related to team's performance (DeChurch & Mesmer-Magnus, 2010).

Communication in a team is essential for teamwork to take place, yet successful communication can often be hindered due to a stressful environment or because team members may be occupied with their individual tasks. To reduce such hindrances Salas et al. (2005) propose *closed-loop communication.* This implies that the communicator follows up with the receiver to make sure that the message has been interpreted correctly. For example, the communicator may ask the receiver to repeat what was just said. Other theorists suggest alternative ways to improve communication, such as common control panels (Lanzetta & Roby, 1956). Implementation of such panels can make sure that all team members have access to full information at all times, which is also called *redundant information*. Morrissette

et al. (1975) have demonstrated that access to redundant information improves a team's performance.

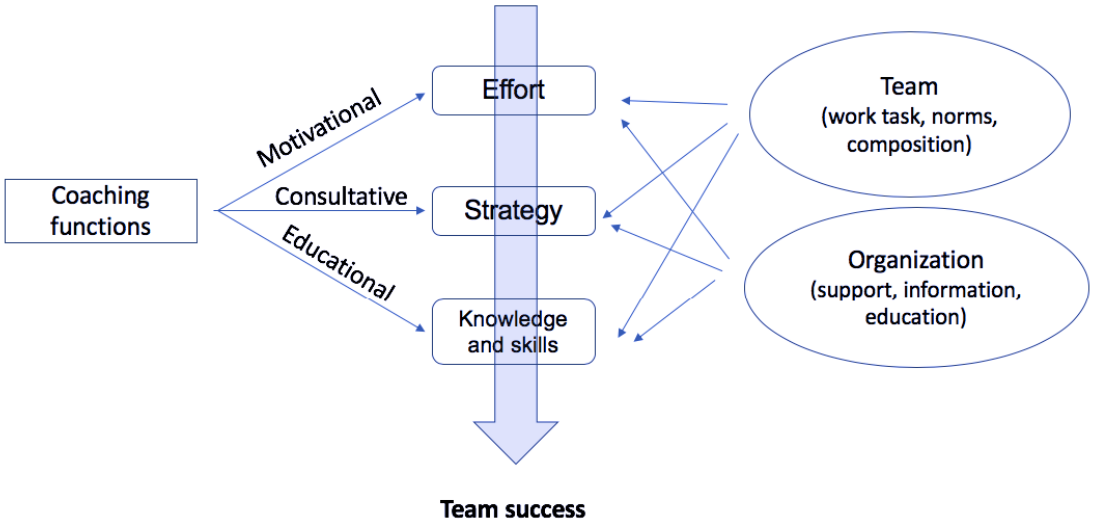
Mutual trust refers to individuals' shared perception that others will act to protect the interest of all the team members and to achieve the common goal. Mutual trust ensures that team members do not spend time inspecting each other's propositions or protecting their own opinions. In absence of trust, team members might be reluctant to share ideas since they do not feel that their input is valuable (Bandow, 2001). Therefore, Salas et al. (2005) argues that mutual trust is crucial for ensuring successful team collaboration.

Now that I have described the prerequisites of successful teamwork, I will turn to the concept of team coaching and how it can affect work teams.

A model of team coaching. Team coaching may be defined as direct interaction with a team intended to help team members use their collective effort and resources appropriately to the task (Hackman & Wageman, 2005, p. 269). Coaching is essential for effective team work, as a coach provides team members with support and helps identify performance gaps (Salas et al., 2015). Team coaching is sometimes understood as an activity typical for team leaders. However, leaders appear to allocate minimal time for team coaching compared to other leadership behaviours (such as structuring teamwork), which suggests that team coaching as an activity is different from team leadership (Hackman & Wageman, 2005). According to the team coaching model suggested by Hackman and Wageman (2005), coaching can increase team's success through three coaching functions: *motivational*, *consultative* and *educational* (Figure 1). The *motivational function* improves a team's ability to manifest and apply collective *effort* to solve a task. The *consultative function* of coaching is to help a team choose an appropriate work *strategy* that allows the time used for each task (time waste) to be reduced. The *educational function* is meant to provide team members with additional *knowledge and skills* that may be necessary for success.

Figure 1

Hackman's and Wageman's Team Coaching Model (2005)



The model proposes further that effort, strategy and knowledge and skills are the three aspects of a team that may lead to work success and are thus the ones that are to be addressed by coaching. These predictions were tested quantitively using a sample of 137 research and development teams from Taiwan (Liu et al., 2009). The results indicated that team coaching motivated team members to apply additional effort to successfully complete tasks. The overall level of teams' competence also increased as a result of coaching. Additionally, the increased effort and higher competence had a positive effect on teams' effectiveness.

However, the contextual factors of the organisation and of the team itself define whether team coaching leads to a desirable result (Hackman & Wageman, 2005). For example, team design defines the level of knowledge and skills a team has, and also how sensitive the team is to coaching. Based on a study of 32 self-managing teams at Xerox, Wageman (2001) concluded that teams with appropriate size, education and diversity of team members perform better as a result of coaching than do teams with poorer designs. Furthermore, a team's effort may be affected both by the type of task and the organisational constraints. Specifically, teams are more likely to invest their effort in tasks that are meaningful and where organisational constraints are low. For example, tasks designed to have variety, identity, significance, and autonomy may lead to higher levels of performance (Cohen et al., 1996). It is therefore likely that team coaching will be more successful in teams who work with meaningful tasks. However, even if teams are granted sufficient autonomy, their performance does not automatically improve. Sethi and Sethi (2009) found that strong focus on quality improvement in an organisation impairs the performance of software development teams with high degree of autonomy. Team coaching can thus show better results in companies where the organisational context does not constrain team performance.

The literature presented above indicates that organisational context plays an important role for teamwork and team coaching. To account for this, I will address theories on organisational culture and leadership in the following section.

Organisational Culture and Leadership

Organisational culture and leadership are mutually dependent and they both define organisational context. As mentioned above, context is likely to have an impact on the effectiveness of team coaching. Therefore, I now turn to the literature on organisational culture and leadership that I will use to explain the relationship between organisational context and agile coaching. To explain what I mean by organisational culture, I first introduce the "layered" model of Edgar Schein. Afterwards, I present the theory of transformational and transactional leadership and finally integrate both culture and leadership perspectives in the third subsections.

Schein's model of organisational culture. *Organisational culture* can encompass a wide range of organisational aspects, such as habits, attitudes, formal philosophy, mental model and corporate climate (Schein, 2010). Despite the fact that different researchers tend to disagree on concrete content of the concept, organisational culture can be broadly defined as a system of "organisational values communicated through behavioural norms and artefacts and observed in behavioural patterns" (Hogan & Coote, 2014, p. 1610). By building organisational cultures, organisations can influence their employees' behaviours through emphasising certain values and corresponding expectations. Edgar Schein has suggested a model that groups the aspects of culture according to how observable they are in an organisation (Schein, 2010). I have chosen this model as it explains why some aspects of organisational culture may be less receptive to coaching than others.

According to Schein (2010), only a limited part of organisational culture can be observed directly. These are aspects such as ceremonies, rituals, symbols, language and physical arrangement of work space. He calls such observable elements *artefacts* and argues that they are manifestations of the less visible aspects of organisational culture, such as *values* and *assumptions* (Schein, 2010). In this way the model describes artefacts as the surface *layer*, values as a deeper layer and assumptions as lying in the very foundation. *Assumptions* are defined as unconscious beliefs about the world that are often taken for granted (Schein, 2010). For example, it is generally assumed in business that the activity of work organisations should result in profit. Such assumptions guide people's *values*, which may be understood as work standards of what is considered to be "good" or "bad" (Dose, 1997; Schein, 2010). In some companies, such as Hewlett-Packard, individual competitiveness may, for example, be

valued higher than the collective success of a team (Packard et al., 1995). Values can, in their turn, define the tangible artefacts (Schein, 2010). Open office landscapes can, for example, reflect the underlying value of face-to-face collaboration. Agile ceremonies, such as stand-ups and retrospective meetings, described earlier, can be examples of rituals that reflect the values of self-organisation and continuous learning. According the Schein model, organisational culture is *stable*, *deep* and *broad*. *Stability* implies that this culture remains relatively similar over a long time and is hard to change. Its *depth* refers to the fact that people are often unaware that their work is influences by cultural aspects. Organisational culture is *broad* because it tends to influence all aspects of a company and how it operates.

The Schein's model does not explicitly describe how organisational culture relates to behaviours of the employees. However, other researchers suggest that behaviours are influenced by certain behavioural expectations that stem from organisational values and that take the form of specific group norms (Hogan & Coote, 2014; Homburg & Pflesser, 2000). Hogan and Coote (2014) examined whether innovative behaviours could be predicted by organisational values that support innovation. Their results suggest that the values have only indirect effect on the behaviours, whereas behavioural norms and artefacts are better predictors. The researchers concluded that innovative behaviour is likely to occur in workplaces where an innovative mindset is promoted both through related values (e.g. willingness to challenge status quo) and artefacts (such as availability of common discussion areas).

Other empirical findings tend to support the importance of norms in predicting occupational behaviours. In organisations where high sales are expected, employees tend to be more sensitive about the preferences of their customers, thus showing market-oriented behaviour (Homburg & Pflesser, 2000). In this way, market-oriented organisational cultures could increase their profitability by promoting the behavioural norms of market orientation among their employees. In work teams, shared norms can also influence team performance by affecting the behaviour of the team members. Stray et al. (2016) reported that the norm of supportive communication helped software developers communicate mistakes in the code more openly within the team, which lead to better code quality.

Schein's theory proposes that leadership is crucial for the development and maintenance or workplace values and behaviours. Leaders are the ones that establish cultures and communicate the underlying assumptions through, for example, their own actions and what they choose to reward or address (Schein, 2010). Empirical findings suggest that organisations with visionary leaders tend to be more open to innovation, as such leaders

provide sufficient resources and attention to support the creative ideas of their workers (Sarros et al., 2008). Leaders also have the potential to change organisational culture if needed (Schein, 2010). Recognising the central role of leaders' behaviour for organisational culture, I will in the next section introduce the concepts of *transformational* and *transactional leadership*.

Transformational and transactional leadership. The concept of leadership is very broad and numerous theories exist that address its different aspects. Findings in the current study suggest that middle- and top-managers are a subject of agile coaching and that management's role is crucial for the success of agile coaching. In order to explain this mechanism I therefore draw on an influential leadership framework first suggested by Bernard Bass and Bruce Avolio (Bass & Avolio, 1994). I have chosen this framework because it focuses on leadership behaviour and thus can be used to explain how managers can shape organisational context. In addition, it offers a perspective on organisational culture as a reflection of a leader's characteristics.

According to Bass and Avolio (1994), effective leadership is often determined by two major styles of leadership behaviour: *transactional* and *transformational*. *Transactional leadership* is typically based on the exchange relationships between leaders and followers, where the follower receives *contingent reward* for having achieved the results set by the leader (Bass & Avolio, 1994). In such a way, managers may motivate employees to work by promising them some goods in return, such as financial support or personal acknowledgement. Transactional leadership using contingent reward is positively related to the organisational commitment of the followers (Avolio et al., 2004). Another form of transactional leadership is *management-by-exception*, where the leader tends to interfere only when there is a need to correct or punish the follower (e.g. in the event of mistakes of low performance) (Bass & Avolio, 1994). Transactional leadership is generally associated with employee performance. However, contingent reward and management-by-exception can in certain cases impair performance (Howell & Avolio, 1993), which led researchers to the conclusion that transactional leadership alone is not sufficient for success of the followers. Instead, it is proposed that *transformational leadership* may be helpful to promote both motivation and better performance (Bass & Avolio, 1994; Howell & Avolio, 1993).

Transformational leaders tend to show four patterns of behaviour: *idealised influence, inspirational motivation, intellectual stimulation* and *individualised consideration* (Bass et al., 2003). The same article states that leaders manifest *idealised influence* when their guidance is consistent with some underlying ethical principles. Such leaders consider their followers'

needs prior to the needs of their own. *Inspirational motivation* reflects leader's ability to set both challenging and meaningful goals. Leaders that show this form of transformational leadership attempt to make followers positive and genuinely enthusiastic about the goals. Through *intellectual stimulation* leaders may encourage employees to be creative and innovative in approaching complicated problems. This form of transactional leadership also implies that leader does not criticise followers for their mistakes, thus creating a foundation for experimenting. *Individualised consideration* describes leaders that attend to followers' personal development by functioning as coaches or mentors. Such leaders create a supportive learning environment that also takes into consideration individual needs for growth. Transformational leadership is often found to predict numerous positive outcomes, such as employees' organisational commitment , better group collaboration and job satisfaction (Choi et al., 2016; Guzzo et al., 1993; Tse, 2008).

Transactional and transformational cultures. Bass and Avolio (1993) argue that leadership style may be reflected in the qualities of organisational culture. Purely *transactional cultures* are characterised by discipline, rules and sanctions. Employees in such cultures avoid cooperation with others, and their motivation is proportional to the reward they receive. Transactional environments tend to be conservative and less receptive to innovation. Managers in such cultures function as supervisors and resource allocators. In contrast, purely *transformational cultures* rely more on common norms and values instead of relying on rules (Bass & Avolio, 1993). There is no strict discipline or expectation of particular reward in return to the effort. People's motivation stems from their commitment to the organisation and desire for personal development. The role of management resembles coaches who make sure that employees share the same culture. Transformational cultures are said to be compatible with innovation and change. Based on responses from 1 158 managers, Sarros et al. (2008) found that transformational behaviour from leaders is positively related to innovative and creative organisational culture primarily due to the ability of transformational leaders to articulate common visions and goals. However, some degree of transactional leadership is also recommended for innovative cultures in order to achieve optimal motivation and success, since transactional leadership is a foundation of the relationship between leaders and followers (Bass et al., 2003).

Now that the central theoretical literature has been presented, I will proceed to the cultural differences that one may expected between the different organisational contexts in Norway and the USA.

Workplaces in Norway and the USA

Since one purpose of this study is to compare Norwegian and US agile coaching practices, I chose to address cultural aspects that shed light on possible differences in work life in the both countries.

Market orientation. Norway and the USA differ in their types of welfare state which can in turn affect the work life. Since the US is a liberal welfare state where citizens are dependent on selling their labour to the market, work there is strongly market-oriented (Esping-Andersen, 1990). In contrast, Norway is a social-democratic welfare state where citizens' dependence on the market is reduced by its system of social policy, provided by the government. As a consequence, market orientation in Norway is not as strong (Esping-Andersen, 1990).

Individualism versus cooperation. Birkelund and Sandnes (2003) argue that in liberal welfare states such as the USA, there is a strong focus on individual achievement. This can be illustrated by work culture in the US-based company Hewlett-Packard, mentioned earlier. Individual effort there is traditionally perceived as more valuable than group effort (Packard et al., 1995). Accordingly, the understanding of leadership in the US is often linked to a single person who leads others. This perception is sometimes referred to as the "Great Man" theory of leadership (Crevani et al., 2007).

Compared to that of the USA, Norwegian work life is less characterised by individualism (Birkelund & Sandnes, 2003). Traditionally, Norway and other Nordic countries have emphasised cooperation and democratic elements in work design, such as systematic use of teams and personnel management (Byrkjeflot, 2002). The Nordic perspective on leadership does not necessarily relate to one person but can be understood as a function in a group or an aspect of organisational culture. For example, nursing managers in Swedish health institutions were encouraged to work in leadership dyads to reduce the burden of workload (Rosengren & Bondas, 2010). This illustrates that collective leadership in the Nordic countries may be valued more than individual leadership.

Focus on work environment. Norwegian workplaces are generally characterised by a strong focus on occupational health (Christensen et al., 2017). This is reflected in the Norwegian Work Environment Act which protects employees' autonomy and the variety and meaningful character of work (Ministry of Labour and Social Affairs, 2006). These aspects are often assumed to promote both a healthy and productive workplace (Christensen, 2017). Such emphasis on work health is an oft-mentioned feature of the so-called Nordic model of work life in the Nordic countries (Gustavsen, 2011). The Nordic social-democratic model is

sometimes contrasted with liberal economies such as the USA, where the focus on the occupational health is not so strong.

Method

According to Yardley (2015), transparency in the description of the methods and procedures is a way to increase the validity of qualitative research. With this in mind, I will now describe how this study was conducted and justify methodological choices made. This section begins with the presentation of the chosen research paradigm and then continues by outlining the process of data collection and the analysis procedures. In the final part, I address ethical considerations.

Research Paradigm

The current study is inspired by the post-positivistic approach to knowledge, which is based on the assumption about existence of the objective reality (Guba & Lincoln, 1994). Post-positivism postulates that, even though research does not have capacity to fully reflect the objective world, we are still able to understand the reality through creating approximate representations of it with the help of scientific method (Guba & Lincoln, 1994). In this way post-positivism is characterised by critical realism, meaning that findings in any research only indicate truth, but are not absolute truth.

In addition, the study is guided by the participatory view on research. The essence of this view is that scientific enquiry should attempt to solve practical problems while at the same time developing new theoretical insights (Mathiassen, 2017). The research design therefore aimed to provide results that can be potentially beneficial for software development organisations and are also valuable knowledge of organisational psychology.

Background of the Study

This thesis is the result of my collaboration with my co-supervisors from SINTEF, which is an independent research organisation. The study was conducted as part of a larger research project which focused on self-managing software development teams. My co-supervisors, Viktoria Stray and Nils Brede Moe, conducted a number of interviews with agile coaches from the USA and allowed me to use some of these interviews as the source data for this thesis. They also allowed me to participate in some of their interviews, where I had the opportunity to ask participants questions. My co-supervisors and I collectively made several decisions on different aspects of the research strategy, such as the research questions, the content of the interview guide, data collection and data analysis. I was solely responsible for recruiting and carrying out interviews with informants from Norway, as well as for all data transcription and analysis.

Qualitative Methods

As argued by Brown and Clarke (2006), it is crucial for the research methods to be adjusted to what the researcher intends to know. Since the purpose of this study was essentially to examine what agile coaches do, I chose qualitative methods that are best suitable for studying "the how" of the research object (Kvale & Brinkmann, 2015). Another reason is that qualitative methods are often recommended for unexplored research topics (Kvale & Brinkmann, 2015). By the start of the current study, there was only limited scientific literature that summarised and discussed the organisational role of an agile coach. Thus, it was a relatively new research area that was suitable for being studied qualitatively. According to Braun and Clarke (2006), qualitative methods provide useful tools for conducting an inductive study. Such studies make general conclusions based on examining and summarising specific observations about the phenomenon under research ("bottom-up" approach). Since I was interested in summarising concrete examples of agile coaching, I chose the inductive approach for this project, which I also applied while conducting the thematic analysis (see below).

Work Practices

The purpose of the study was to explore how agile coaches worked, so it was decided to choose research methods that focus on concrete *practices* applied by the informants. The term practice has many different definitions (Nicolini, 2012), but in this study it is used to signify sets of concrete tasks and tools that are used to achieve certain goals. It is consistent with the view that practices include both perceived ends and concrete techniques that aim to achieve those ends (Nicolini, 2012). The techniques could be both verbal (for example, one-on-one conversations) and technological (e.g. using digital task boards). The examples of the ends could be to motivate team members or to create understanding of agile values.

Data Collection

In this section I describe the data collection processes and procedures, which included developing the interview guide, receiving approval from Norwegian Centre for Research Data (NSD), recruitment of the informants, carrying out the interviews and subsequent data processing (data storage). I will start by addressing qualitative interviewing, which was chosen as the data collection method.

Qualitative interviewing. Qualitative interviewing is one of the most commonly used methods of data collection within qualitative research (Legard et al., 2003). Consistent with the understanding of work practices in Nicolini (2012), my co-supervisors and I were interested in techniques and procedures used by agile coaches, along with their motivation

behind these. Seeing that in many cases we were not able to observe the practices directly (due for example to participants living in other counties or cities), we chose qualitative interviewing as a means to collect the data.

Given that we had only limited knowledge on what agile coaches do at work and why, our initial interview guide consisted of open questions that would allow participants to answer broadly. In order to be able to adjust our questions to what is being said, we chose to use a semi-structured interview form (Kvale & Brinkmann, 2009).

Interview guide. The interview guide was informed by the literature on agile software development methods. The document was developed prior to the data collection and consisted of several sections (see Appendix B). It was structured according to the model recommended by Kvale and Brinkman (2009) with an introduction, a main section and a debrief. The introductory section consisted of two sub-sections: *Practical details* and *Background*. In *Practical details* we summarised the informants' rights in relation to our research project and to the participants' informed consent participate the project. *Background* contained "warm-up" questions that would be simple to answer (such as *Could you describe your typical work day?*). This was in line with recommendations of Tjora (2012) that such questions prepare the participant for the main section.

The main section consisted of several sub-sections labelled *Agile, Organisation, Teams, Self-organised teams* and *Coaching*. The first three sub-sections explored the context of the informants' organisations, such as the typical work processes, the composition of the teams and the organisations' attitudes towards the agile framework. Questions in the last two sub-sections were focused on participants' practices as agile coaches (e.g. *How do you coach?*) and to trigger their reflections on these practices (e.g. *What are the factors that hinder your teams from being truly self-organised?* and *What is the purpose of an agile coach?*). We attempted to formulate questions in such a way that they encouraged the subjects to recall concrete descriptions of work situations (e.g. *Could you give examples of how your teams functions as self-organised?*). In addition, we avoided using academic terms such as *work demands* and *coaching techniques* in order to keep the language more informal and easily understandable for the participants.

The debrief or closing section's purpose was to prepare participants for the end of the interview and to open up for the topics that had not been touched by the previous sections (with questions like *Is there anything you want to add that you feel we haven't covered?)* and to thank for the participation. Kvale and Brinkman (2009) emphasised the importance of the debrief for the participants' emotional comfort.

The interview guide was partly refined during the data collection process according to the insights gained from the interviews and our reflections on the role of the agile coach. For example, we included a section with questions linked to personal and professional characteristics which was not initially on the question list. We also increased attention to the *Coaching* topic and reduced the number of questions about teams as it became apparent that agile coaches do not work solely with teams.

NSD-notification. According to the general data protection regulations, I submitted a notification about the data collection to Norwegian Centre for Research Data (NSD). The notification was evaluated prior to the beginning of the data collection and was concluded to be in line with the personal data legislation (see Appendix C). Specifically, the recruitment procedures, the data collection and data processing were confirmed to be in line with the participants' rights to protect their personal information. The procedures reported in the notification were followed in the subsequent data collection performed in Norway. Further on in this sub-section, I describe these procedures in detail.

Recruitment of the informants. The recruitment method can be described as purposive and snowball non-probability sampling (Tashakkori & Teddlie, 1998). In using purposive sampling, we were searching for participants based on their specific characteristics (work as agile coaches). After the interviews we asked participants whether they knew other agile coaches who might be interested in participating in the study (snowball sampling). Normally, the informants received an invitation to participate, accompanied by the information letter about our study (Appendix D). The letter was in line with the recommendations of the NSD and contained our research question, the description of the project´s purpose and what participation involved (e.g. 45 minutes interview). We also included information about the project coordinators, the personal data processing and the informants' rights with regard to their participation. Specifically, we reassured that participation was voluntary, anonymous and based on consent which could be withdrawn at any time. The letter also contained a consent form. If someone agreed to become an informant, they were asked to sign this form and send the scanned copy to me, as the project coordinator, prior to the interview.

Informants. There are a total of 14 interviews from 15 agile coaches used in this study, including one group interview with two participants from the same company (see Table 1). Eight participants were employed in US companies, whereas seven participants were from Norway. There were seven women and eight men in the sample, indicating that both sexes were represented evenly. Four coaches were contractors hired to their current organisations

through external consulting agencies. One of the participants had a clear leadership responsibility in addition to being an agile coach. Five US-based participants were employed at the same organisation (Alpha), a matter which I will later address in the discussion (section "strengths and limitations"). The other coaches were employed in different organisations.

Table 1

The Informants

N	County	Sex	Hired consultants	Leader responsibilities outside coaching	Approx. company's size (n employees)	Company's code name
1	USA	F			29 000	Gamma
2	USA	M			125 000	Alpha
3	USA	M			201 000	Beta
4	USA	M		x	201 000	Beta
5	Norway	M		x	600	Delta
6	Norway	F		x	400	Epsilon
7	USA	M	x		125 000	Alpha
8	Norway	F			400	Zeta
9	Norway	M			150	Eta
10	Norway	M	x		11 000	Theta
11	Norway	F	x		900	Iota
12	Norway	F	x		11 000	Theta
13	USA	F			125 000	Alpha
14	USA	M			125 000	Alpha
15	USA	F			125 000	Alpha

Conducting the interviews. The majority of the interviews were conducted online with the use of digital meeting tools like Zoom and GoToMeeting, whereas two meetings were carried out in person. The interviews were scheduled in advance to make sure that the participants had the required amount of time to dedicate to the conversation. During the interviews, informants were typically in their offices or meeting rooms. The estimated length of an interview was 45 minutes, but this ranged from 30 minutes for the shortest interview to 90 minutes for the longest one. I conducted the interviews with five participants from Norway and was a co-interviewer in four interviews with US-based agile coaches. The rest of the interviews were carried out by my co-supervisors from SINTEF independently.

Several scholars emphasise the importance of a safe, relaxed relationship with informants during the interview, which has an influence on the data quality (Kvale & Brinkmann, 2015; Tjora, 2012). To account for this, we attempted to keep the interview tone friendly and informal. At first we would normally present ourselves and the project and

remind the subjects that participation was anonymous and voluntary. We would then ask for permission to record the conversation and start with the warm-up questions.

Given the semi-structured nature of the interviews, the interview guide was not followed strictly, in order to preserve the natural flow of the conversation. We, for example, sometimes changed the order of the question and the question formulation to adapt to what was being said. We also asked many follow-up questions in an attempt to increase the number of concrete descriptions in the data (Legard et al., 2003). For example, when participants used term like "tools" we could asked them to give an example of that. If a practice was mentioned (e.g. a stand-up meeting), we would encourage the participant to describe how this happens in that person's respective organisation.

Audio from both online and offline interviews was recorded. All informants were asked whether they were comfortable with being recorded and gave a positive answer.

Data Analysis

This section gives an overview of the data analysis method used in this study. I start by presenting the variant of qualitative approach that I chose, which is thematic analysis, and then continue by giving a step-by-step description of the analysis process.

Thematic analysis. For this study I used thematic analysis, as described by Braun and Clarke (2006). They define thematic analysis as a method of identifying, analysing and reporting patterns within data, which are called *themes*. A theme should reflect something significant about data that is able to answer the research question. The final set of themes should structure the data and represent it in a meaningful way.

Inductive approach. As mentioned earlier, agile coaching is not well explored in academic literature which is why I chose the more inductive version of the thematic analysis. According to the recommendation of Braun and Clarke (2006), such an approach allows the analysis to be performed in a way that is closely linked to the data. Certain deductive characteristics of the analysis should be acknowledged, however, since in the process of identifying, labelling and describing the themes, I inevitably incorporated theoretical concepts found in the literature of occupational psychology (e.g. organisational culture, leader, etc.).

Semantic thematic analysis. Given that I was interested in relatively concrete ways agile coaches functioned at work, I was not focusing on participants' implicit intentions and assumptions behind what was being said, but analysed the actual content of their speech. My approach can thus be compared to what Braun and Clarke (2006) define as the *semantic approach*, which is opposed to the *interpretative approach* that seeks to uncover hidden intentions behind the statements. However, the current analysis process did involve a certain

degree of interpretative thinking, which was necessary to understand the significance of the discovered data patterns for the research question (Braun and Clarke, 2006). Specifically, I relied on my own interpretation of what can and cannot be considered a practice.

Analysis process. The data analysis was conducted with the use of NVivo 12. The process can be described in six phases: 1) familiarisation with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) defining and naming themes and 6) writing the report, which is informed by Braun and Clarke (2006). In the following sub-sections I describe how I analysed at each particular phase, which will contribute to the transparency of how I came to the current results.

Phase 1. Familiarisation with the data. Braun and Clarke (2006) recommend that the analyst become familiar with the data's content and what is interesting in the dataset because it allows them to get the initial idea of a possible coding pattern. I followed this recommendation by transcribing all the interviews myself while at the same time creating memos to note my thoughts on the content. Since we took a semantic approach to the analysis, I chose not to include repetitions and small speech errors in the final transcripts if they did not seem to add anything significant to the actual content. This was done in order to improve the "readability" and sharpen the essence of what was being said, thus retaining the important information (Braun & Clarke, 2006).

Phase 2. Generating initial codes. This phase implies identification of the basic elements of the raw data which are called "codes" (Braun & Clarke, 2006). To complete this and the following phases I used NVivo (Version 12), which is a software for coding and analysing qualitative data. At the coding stage I was focused on content that could contribute to describing agile coaching practices. Such content was linked to one or sometimes several codes in a way that allows for repetitive use of the same code for different parts of data. Each individual transcript was coded in this fashion one-by-one, as recommended by Braun and Clarke (2006).

Phase 3. Searching for themes. After all transcripts had been coded, the codes were sorted out in an attempt to collect similar codes within the potential themes. Related codes (for example codes for practices that were used for similar purposes) were grouped together and preliminary names for themes and sub-themes were given, which is in line with Braun and Clarke (2006).

Phase 4. Reviewing the themes. At this phase the themes were revised in order to represent relevant parts of the data in a meaningful way. According to the recommendations, some code groups were broken down, whereas others were collected into bigger blocks in an

attempt to achieve internal coherence within the future themes and sub-themes (Braun & Clarke, 2006). At this stage many sub-themes were grouped according to which organisational impact the practices in these sub-themes were aiming for. Following the guidance from Braun and Clarke (2006), the whole data set was revisited at this point in order to evaluate its fit with the current thematic structure.

Phase 5 and 6. Naming the themes and writing the report. When the thematic structure was satisfactory for reflecting the content of the data set, the themes and the respective sub-themes were given their final names and definitions. This process was combined with the parallel writing of the report, which allowed for better reflection on each theme's unique contribution in representing the data. As recommended by Braun and Clarke (2006), vivid examples were included in the report to illustrate each sub-theme. I also included examples of work practices within each sub-theme to demonstrate that each practice is sufficiently grounded in the data. At this stage, the Norwegian extracts included in the report were translated to English.

Comparative analysis. The frequency of codes from the final thematic structure was compared between the informants from Norway and the USA using NVivo. This was done in attempt to explore possible country-specific differences in terms of agile coaching approaches.

Results

The purpose of the study was to examine the function of agile coaching. This section presents the results of the thematic analysis that focused on the informants' descriptions of their work practices. Prior to presenting the thematic structure, I will describe the organisational context of the informants. In the final part of this section, I will present the results of comparative analysis of agile coaching in Norway and the USA.

Context of the informants

Agile coaches in this study came from various companies that significantly differed in size and domain of activity, and represented two different countries (Norway and the US). Therefore, there was no single organisational context all informants belonged to, which only allows me to be very general in describing it. However, I will now roughly outline some contextual similarities and differences in the organisational and professional background of the informants. I will also address barriers that were described as typical challenges for agile coaching and how the function of this role could differ from context to context.

Organisational background. All organisations produced software in some form, although not all of them had software development as their main domain. Other domains were banking, chemistry, energy and entertainment. Probably, the most significant similarity across all organisations was their decision to use agile software methods and to introduce agile coaching. However, the companies differed in how long they had had this role, with some having done it for several years and others making their first attempts. Almost all organisations operated in the private sector, whereas one Norwegian company was public.

In smaller companies (up to 1000 employees) there would typically be one or two agile coaches. In contrast, bigger companies could have entire agile departments with up to 30 agile coaches of different degrees of competence and length of experience. Such departments had their own leadership, team structure and recruitment and training programs.

Professional background. "Agile coach" was the official title of most of the informants. The informants confessed that this title was not in high demand on the job market until a couple of years ago. In terms of their professional background, all agile coaches could be roughly divided into two groups. Informants in one group used to work in software teams as either developers or testers prior to becoming agile coaches. These were experienced technologists who after a while acquired leadership skills due to their expertise. The majority of the informants came from this first group. The second group contained people with a background in project management or business and administration. They could be defined as middle managers with technological understanding who had competence within the agile

project management framework. Informants from both groups were certified in agile project management after completing some form of training (for example a 3-day Scrum Master course).

Many agile coaches, especially the ones from Norway, were hired consultants. Often, these consultants belonged to the group with technological background. The informants who were not consultants, usually had been working in their organisations for several years prior to becoming agile coaches. These could be people with both a technological and a business background.

Typical barriers. Despite the differences in organisational and professional background, the informants mostly agreed on challenges that they typically faced in their work. These challenges were primarily linked to introduction of agile methods. The central barrier was misunderstanding of the value of the agile framework for software development among employees and managers. People tended to perceive agile methods as a set of ceremonies, such as daily stand-ups and retrospective meetings. However, the essence of agile software development, according to the informants, lay in its ability to make planning and decision-making processes more flexible and tailored to the needs of the customer. This essence was not always perceived by management that tended to constrain the work of software teams with specifications and top-down control.

Such misunderstanding often resulted in what the informants called “fake agile”. “Fake agile” arises in organisations where teams are allowed to apply agile ceremonies but are not actually able to influence their planning and decision making to the extent necessary for fully benefitting from the agile methods. The informants believed that “fake agile” is caused by the people’s “mindset” being very hard to change in accordance with agile framework. They suggested that the reason behind this conflict was that “culture” in many organisations was different from the culture that was required for the agile methods to thrive. Some other challenges could be considered the consequences of fake agile. For example, middle managers often resisted the introduction of agile methods or did not see value in it. Other agile coaches, especially those with project management background, did not always provide teams with the required support for their teamwork and autonomy.

Function of agile coach. The content of agile coaching seemed to largely depend on organisational context. Agile coaches often adapted to the needs of their organisations. For example, some informants were hired to improve agile competence in software teams, whereas others were expected to improve agile competence in entire companies. However, the concrete tasks of agile coaches were seldom specified by organisations, which made this role

very flexible. One informant complained that he was confused about what exactly the hiring company expected him to do. It thus appears that agile coaches have a lot of freedom in what and how they do in their organisations. This also implies that the function of an agile coach may vary significantly from company to company.

Now that the contextual factors have been outlined, I will proceed to description of the main results of the thematic analysis.

Thematic Structure

The thematic analysis indicated three major themes in the data set: *Teamwork, Enterprise agility* and *Better products* with each theme having a number of sub-themes (see Table 2). *Teamwork* collects examples of practices that aim to enhance work in software development teams. The practices are grouped into sub-themes according to which purpose the agile coaches appeared to pursue by using them: *Create awareness of the work process, Help teams learn and adapt, Promote good psychosocial environment* and *Support Product Owner and Scrum Master. Enterprise agility* contains practices that target various organisational aspects that were not directly related to teamwork. The sub-themes illustrate different aspects of the companies that the informants were seeking to address: *Remove bottlenecks, Teach agile methods, Get everyone on the same page, Change organisational culture, Coach leaders, Collaborate with HR department* and *Set-up work process.* Data in the last theme was associated with improvement of the software products and received the name *Better products*. The respective sub-themes summarize how agile coaches synchronise developers and customers by *Increasing the team's understanding of the product* on the one hand and by *Coaching business* on the other hand. The next few sub-sections describe the themes and the sub-themes in detail.

Table 2

Overview of the thematic structure

Overarching theme	Sub-themes
1. Teamwork	Create awareness of the work process
	Help teams learn and adapt
	Promote good psychosocial environment
	Support Product Owner and Scrum Master
2. Enterprise agility	Remove bottlenecks
	Teach agile methods
	Get everyone on the same page
	Change organisational culture
	Coach leaders
	Collaborate with HR department

		Set-up work process
3.	Better products	Increase team's understanding of the product
		Coach business

Teamwork

The agile coach's role is primarily associated with software developer teams. This topic summarises practices that are meant to improve work in development teams by creating awareness of the work process, helping teams to learn and adapt, promoting a better psychosocial environment and supporting Product Owner and Scrum Master (see Table 3 for the illustrative quotes).

Create awareness of the work process. In line with the agile framework, coaches are supposed to help teams with planning the work by, for example, facilitating stand-up meetings, which was also the case for agile coaches in the current sample. Apart from that, the majority of agile coaches described two issues with the work process that they commonly addressed in their teams. The first issue had to do with high workload, when teams typically worked on several tasks at a time. That could, according to the informants, have negative consequences for the developers' level of stress. The second issue concerned the implicit nature of working rules within teams. Little awareness about how to work together could create unrealistic expectations among team members towards each other. Here is how these issues were described by one of the agile coaches: "*The problem is that we do too much at the same time, so we become stressed and the quality goes down, and we deliver less, and the relationships are weakened because we become stressed and then become a bit aggressive. <…> Another thing is that we are not that good at defining the work process, so there a lot of misunderstandings and things maybe fall between two stools, because I thought that you should do that and you thought that I should do that*" (Informant 12).

Agile coaches usually attempted to solve these two issues by coaching teams for what they called "a better team process". They encouraged teams to control their workload and be mindful of their prioritisation. The related coaching practices involved use of different visualisation tools (quote 1). For example, many informants encouraged their teams to use task boards such as Trello to monitor their work progress (Appendix E contains an example of how a Trello board may look). These tools allow the user to create and delegate tasks to different team members and to keep track of the workload of each individual and team as a whole. This information is visualised in a simple and intuitive way and can be accessed by every team member at all times. Instead of working with several tasks at a time, the informants often made teams break the tasks down into individual steps, and then address

them one-by-one (quotes 2 and 3). This approach was based on the observation that several parallel tasks were harder to handle than one single task that the team fully dedicated to.

Agile coaches increased awareness of work rules within teams by using exercises that helped team members agree on how they should work together. “Team canvas” was often mentioned as an example of such exercise (see Appendix F for a template that is often used to conduct this exercise). This exercise allows the facilitation of a discussion about the common goals, roles, values and activities in the team. These four aspects represent four fields on the template that is used to conduct the exercise. The agile coaches usually invited team members to place post-it notes on each of the four fields and to discuss them with the rest of the team. The rules that the team agrees upon were commonly followed up on later by the agile coach and revised by the teams if necessary. Examples of team rules could concern common working hours and the mode of interaction (i.e. face-to-face vs. online, see quote 4).

Help teams learn and adapt. Continuous learning based on monitoring the team’s work process is central for the agile framework. In line with this, the coaches made considerable effort to help teams learn and adapt throughout the cycle of product development. One informant described the adaptation process as a constant evaluation of the team’s work practices in terms of their effect on the work results. The practices with negative effect should be rejected and replaced by more functional ones: “*With any agile method, the most important thing for me, personally, is that you inspect and you adapt, or you have a retrospective, you know, it was inspecting your process and learning, you know what is working for us and what should we continue to do, as well as talking about the things that aren't working so well, and try and come up with solutions to make those things better*” (Informant 3).

Typical ways to enhance teams’ learning and adaptability were through making them continuously evaluate their work process (see Table 3). Based on that, agile coaches invited teams to explore new ways of working. Retrospective meetings were often described as an arena for agile coaches to encourage the evaluation process in their teams. They commonly opened up for team discussions about what had been working well in the last work period and what had not. Based on the team members’ conclusions, agile coaches stimulated them to agree on which improvements should be made. A usual technique used to facilitate such discussions was asking teams open-ended questions that were supposed to boost people’s “thinking process” (quote 5). Some agile coaches also used retrospective meetings to encourage teams to count the number of hours spent on different types of tasks. One

informant believed that counting hours will help team members to estimate the length of a similar task in the future (quote 6).

Furthermore, a team could be asked to take a survey that gives an anonymised insight into how the team processes are experienced by the individual members (see Appendix G for examples of questions in such surveys, e.g. "Comparative Agility"). One coach used the results of such surveys in order to make team reflect on them (quote 7). The goal was to let the team members give mutual feedback and discuss which improvements could be made. The role of an agile coach in this process was to make sure that the teams took steps ("action items") to change the dysfunctional processes and/or adopt more adaptive ones (quote 8). Most of the time, agile coaches took responsibility for following up such "action items" to help teams incorporate their own decisions.

In order to help teams to find better work processes, agile coaches often encouraged them to explore new ways to collaborate (quote 9 and 10). Retrospective meetings could be used to help teams solve concrete tasks and make complex decisions. The agile coaches could facilitate teams' common thinking process by helping them visualise how exactly a certain work process will be conducted ("road maps"). For example, one agile coach told how he used a retrospective to help teams to visualise a process linked to the product's support (quote 11).

Promote good psychosocial environment. As mentioned above, learning and adaptability was considered by the informants to be central for successful teamwork. A considerable effort was therefore spent to promote a good psychosocial environment that could, according to the agile coaches, boost learning. A good learning environment was linked to the extent to which a team feels comfortable about failing. Many informants emphasised the importance of teams feeling safe to fail for their ability to learn and succeed: "*There's a lot of times that with agility we want to learn. And teams who are agile view failing as a learning experience, a learning opportunity, getting feedback, course correcting and moving on*" (Informant 4). Agile coaches were thus the ones promoting good psychosocial environment both within and outside software teams. Some informants could consciously allow teams to fail to reduce their fear of making mistakes and demonstrate its benefits for learning (quote 12). If a team actually failed, an agile coach could help reformulate the situation in a positive way to motivate for further exploration (quote 13).

In order to stimulate a good psychosocial environment, coaches invested in trustful relationships within teams. They could, for example, stimulate constructive dialogue within the team if they observed that certain team members tended to work in isolation for a longer

time (quote 14). It was also important for the agile coaches not to be perceived by teams as dominant, controlling or threatening. One informant spent several weeks in order to establish personal relationships with team members by searching for common interests and letting them grow used to her presence (quote 15). One could also improve team members' psychosocial environment by promoting higher motivation and enthusiasm. One agile coach engaged in dialogues with the team members to get insight into what motivated them (quote 16).

Support Product Owner and Scrum Master. Almost all agile coaches who worked with teams supported the Scrum Master and the Product Owner (PO) that belonged to these teams. People in these roles are crucial for teams' planning and prioritisation. Agile coaches trained them to conduct retrospective meetings and other agile rituals with their teams. The informants could also plan these meetings together with the Scrum Master and/or PO (quote 17). In addition, it was also usual to have one-on-one conversations with Product Owner in which agile coaches made them reflect on the way to successfully prioritise tasks within a work period or sprint (quote 18).

Table 3

Practices and illustrative quotes associated with the theme Teamwork

Practice	Examples	Illustrative quotes
Create awareness of the work process	Encourage to control the workload	**Quote 1** "And with regard to address that we have too much going on at the same time, it is often… often people use one or another tool to have their tasks in, either Jira or Trello, or a board. If we don't have that, this is the first step to get done, one or another way to visualize the work" (Informant 12).
	Help brake the tasks down	**Quote 2** "So a part of the problem they are struggling with it is maybe they are not able to prioritize in a good enough way. There have been examples of how one could work together five people towards one goal. Now we are only going to work with <product> for example. And then everyone works with the tasks linked to that. And collaborate much better and with a much better experience of how the sprint goes. So we wish to try to coach them a bit in this direction to find just one goal that they can work for" (Informant 9).
		Quote 3 "I've actually started to work saying, showing them where we want to make sure that we're more involved with breaking things down further, not just taking this big old chunk of work and throwing it at them and trying to build the backlog (Informant 14).
	Make team rules explicit	**Quote 4** "They work a lot with team dynamics, because they are trying to become a team. So we have worked with "Team canvas", which is an exercise to work towards common goal and have an overview. As a type of team contract, actually. So we have done this and I am following this up. <…> In the start phase in another team we have one exercise like this to create team rules. <…> For example that they should not meet before 12 o'clock, they should mark their absence in Outlook, they should have dialog face-to-face and not online. And then we follow these up during retrospectives <…> if they should be changed" (Informant 11).
Help teams learn and adapt	Make evaluate the work process	**Quote 5** "You should in a way ask good questions that trigger a thinking process in the team members, that makes it possible for them to make the changes themselves" (Informant 8).

	Encourage to explore better work processes	**Quote 6** “When we log down our work hours we can actually see that we <…> learn from the hours that we have logged down. So the next time it will be easier to estimate” (Informant 6). **Quote 7** “I really enjoy “Comparative agility” because it allows the teams to express their thoughts as they look at those statements. And I go in and I gather the team together and I say «Well, what do you think about this? This is what your team is concerned about». And so I have conversations about «what do you think?», «what would you do to improve?» ” (Informant 2). **Quote 8** “What I'll do is I actually take my retrospectives, and I gear them towards what I'm trying to get from the teams. And then I'll take that information and coach the teams with action items, and then follow up <…> on their action items” (Informant 4). **Quote 9** “So what I try to do is to encourage them to explore how they can do things differently” (Informant 2). **Quote 10** “I really enjoy using training sessions and methods as tools to inspire and help them figure out how they can go back and do things differently right off the bat” (Informant 15).
	Facilitate complex decision-making	**Quote 11** “They were having a real struggle om how to handle support issues. <…> They were discussing whether they should allocate 10% of their time to support, how do they handle those? And <…> I said “Well, what would be this magic wand idea of how to approach support?” <…> And as a result of half an hour discussion we mapped out process. <…> As a result they don´t have to reserve time, they just have to follow the process. And they can make decisions” (Informant 2).
Promote good psychological environment	allow teams to fail, give praise for mistakes, address relationships within teams, build relationships with teams, make small sacrifices for engagement	**Quote 12** “If they <team members> suggest a decision, I can feel “It is not gonna work”. Then I might still let them fail. Because there is so much learning in failing that it might be worth it” (Informant 9). **Quote 13** “Each team down there needs to be able to make their own operative decisions then and there with absolutely no criticism. And be allowed to try and fail and get praise for doing so: “It is fantastic that you have chosen this technology! Without asking us and actually made a version of the solution. Unfortunately that doesn’t work and we cannot maintain it because we don’t know the technology. So you need to write it once again. But! This is really fantastic that you did it!”, right? So you need to have this culture for that” (Informant 5). **Quote 14** “So one of the team members for some reason had gotten into this habit of working by himself in a silo. And nobody knew what he was doing, whether he was even working, and the other team members, as the manager knew about it, but we decided that the team has to first talk to him” (Informant 13). **Quote 15** “The one of them was wearing a Star Wars t-shirt. I'm like «Hey, I like Star Wars!» and kind of got in till they, you know, saw that I wasn't scary. And I wasn't going to make them do things and yell at them. And then after probably less than... I don't know, less than three weeks, definitely less than a month, then they started asking me questions. <...> so this team was called <team>. And they started calling me the «<team> whisperer». And now they're, they're an amazing team” (Informant 15). **Quote 16** “So what I try to do is to find out what is it that drives this person and what are things we need to talk about and focus on, that help this person become super motivated and feels there is something valuable to it” (Informant 5).
Support Product Owner and Scrum Master	Train how to conduct meetings	**Quote 17** “With the teams it goes actually through the Scrum Master. Since there are 5 teams I have to kind of distribute my time somehow. So I join retrospectives. But then I kind of support the Scrum Master in how he leads the meeting. And the product owner. So we can often have preparation meetings so I can kind of coach them by telling how to conduct a good meeting in practice <...>” (Informant 11).
	Train how to prioritise	**Quote 18** “Just as yesterday when I talked with a PO and we agreed on a meeting that we will have tomorrow when we gonna talk about the PO-role <…>. When you then face four customers, potentially four different goal within one

sprint. How, if you were to choose one, how would you choose? And then I force him to make some choice" (Informant 9).

Enterprise Agility

The majority of informants emphasised the importance of working with the whole organisation in order to achieve positive results at the team level. Agile coaches could represent teams' interest in the organisations for the issues that lie outside of the teams' authority, such as financing and the teams' composition: *"In the teams one discovers things that are not optimal. Some of those things can be fixed by the team itself. But other things they cannot fix on their own. Typically these are processes that are on organisational level. Examples can be how the task is being financed, how the teams are established. So this is what I am supposed to focus on" (Informant 12).*

It became apparent from the interviews that agile coaching can be practiced both at team and organisational level. Agile coaches were involved into optimisation of the organisational processes through integrating individual employees, teams and management. Some informants who practiced this, called it *enterprise agility*, which also gave name to this theme. The theme's practices and their respective quotes are summarised in the Table 4.

Remove bottlenecks. Coaches perceived themselves to be the ones detecting and removing bottlenecks in their organisations. This is how one informant described it: *"It is almost an intuitive process, that you enter organisation and then try to sense it as good as possible. Ok, what is it that grates here? Where in the mechanism does that strange sound come from? Which parts are the ones that need to be screwed and tightened?"* (Informant 5). Typical bottlenecks that were mentioned had to do with so-called "cross-team dependencies" where one team had to rely on another one in order to deliver its part of the work. In order to reduce dependencies, coaches sometimes worked across teams to facilitate their collective planning and communication. Other teams' representatives were invited to the coached team's stand-up meetings (quote 19). Such cross-team collaboration allowed the dependent teams to plan together. Teams were also trained to detect their own dependencies during daily stand-up meetings. Informant 14 was sure it was important for success in the team (quote 20).

Another example of a "bottleneck" could be employees' meeting behaviour. Agile methods require high degree of face-to-face collaboration between employees, which often leads to an increased number of meetings. Some employees may be negative about this, which can impair collaboration. To cope with this, some of the informants coached employees in productive meeting behaviour. For example, informant 9 created a chart that was illustrating

how to decide whether one should attend a meeting or not and how to make meetings effective. He then shared this chart with all employees (quote 21).

The bottlenecks that the informants addressed could also be linked to the issues that require immediate organisational response but were not directly related to software development. For example, one agile coach in a quickly growing organisation took responsibility for setting up the onboarding process. It was important to constantly recruit and educate new employees in the agile methods due to the increased growth of the company, something the informant called a "pain point" (quote 22).

Teach agile methods. By removing the bottlenecks, coaches contributed to solving current organisational constraints that teams faced. Another approach was to adjust the organisations in order to avoid similar challenges in future. Agile coaches in big companies often taught agile methods and created a shared understanding of agile values across the entire organisations. In one big US company such an approach was referred to as "full-stack coaching": "*We call it full-stack coaching. So, from the teams and then, managers, product managers, product owners, executives, just all. Anybody the team touches, business partners and things like that*" (Informant 15).

In order to teach agile, the informants applied classical educational tools such as classes and workshops. Some of such classes were available for employees at all levels, whereas other classes targeted specific departments or groups of leaders (quote 23 and 24). The informants pointed out that the existing agile competence that Scrum Masters and Product Owners had, often was not sufficient and needed to be developed further. SMs and ROs were trained through one-on-one discussions with the agile coach. The purpose of such discussions was to increase their understand of how agile methods can be applied within the context of a respective company (quote 25). Agile coaches themselves were continuously developing their own competencies through monitoring online agile resources or discussing their work with their superiors. Informant 9 described such discussion as very useful because he was new to agile coaching and experienced that the discussions helped him to learn faster (quote 26).

Get everyone on the same page. The majority of coaches sought to align their organisations by creating common understanding across different organisational units. This understanding could concern values, visions and technologies applied by employees. Some coaches, together with the employees, customised the agile values and principles of work to the context of their organisations. One informant conducted interactive workshops for different groups of employees in order to agree on what it means for them all to work "agile"

and what concrete examples of that may be (quote 27). Some interviewees also established networks and common communication platforms to motivate different departments to come to a common understanding of agile methods by exchanging experience from their current work. One agile coach conducted weekly meetings where employees from different departments discussed the progress of their projects, which was called a "weekly demo" (quote 28). Networks were also established across the software teams. One agile coach told that if a team had particular challenges, she would put it in contact with other teams that had experienced similar struggles in the past (quote 29).

Change organisational culture. The informants often perceived themselves as "cultural change agents" and talked about the agile framework as a revolutionary way to approach organisational culture in general: "*It is this revolution that I am working with, which is to change peoples' mindset, pattern of thought and decision*" (Informant 8). It is apparent from this quote that introducing agile methods is not a purely technical process; it implies a change in people's attitudes, their way of thinking and, eventually, their values. Many informants agreed that such change was essentially a change in culture which they tried to facilitate.

A typical example of cultural change that agile coaches promoted was a transition from "project culture" to "team culture". The main difference is that in the project culture, employees work relatively independently from each other under the guidance of manager who is responsible for the final results. In the team culture, employees work as a team and take collective responsibility for the results. Introduction of the team culture and self-organising teams is an important component of agile software development. Some informants were willing to introduce the team culture in their departments but met resistance from their leadership. One Norwegian informant tried to overcome this by explaining the benefits of a team-based project approach to the leadership, which she referred to as "a battle" (quote 30). Team culture was therefore not always welcome in organizations.

Another consequence of the project culture as the informants perceived it, was that management typically controlled employees' work processes with various sanctions. Informant 11 described, for example, that prior to the introduction of agile methods in her team, the employees were punished with sanctions for imprecise estimation of their working hours for a project (quote 31). As a result of her coaching, such restrictions were removed.

Coach leaders. As it appears from the previous sub-theme, management could in some cases hinder the introduction of agile methods. In fact, many informants considered resistance of middle management to be a major barrier for agile software development and

teamwork in agile teams. Here is how one informant described it: "*Our delivery managers typically had the responsibility to deliver. Now we've shifted that responsibility to the team. So the leaders now feel like they don't have as much responsibility as they did before, but they do have accountability. Helping them understand the differences with driving are shifting priorities on a team has been a challenge*" (Informant 1). The quote illustrates that managers were struggling to understand their role in the agile teams that did not require as much control as before. It was therefore important to reduce their uncertainty by providing leaders with better information and training.

The informants described how they informed and coached leaders at both middle and top level. Just as other employees, middle managers were educated through courses, workshops or discussions (see *Teach agile methods*). Additionally, some agile coaches (primarily in the US) conducted leadership training sessions in order to help managers transition from a controlling leadership ("command-and-control") to a style that is more in line with the agile framework. That style was referred to as "empowering" leadership (quote 32). One informant trained managers to lead agile ceremonies through so-called "situational coaching" where she supported her coachees in conducting meetings by coming with suggestions throughout the ceremony. Such sessions could be combined with informal one-on-one conversations where the agile coach and the managers discussed the outcomes of the meeting (quote 33).

Collaborate with HR department. As mentioned above, some agile coaches sometimes worked with areas outside software development, such as onboarding and psychosocial climate within teams, which is typically a responsibility of the human resources unit. The interviews suggested that agile coaches could also be involved in other HR areas and directly collaborate with HR personnel. One informant participated in regular evaluation of the employees' perceptions and attitudes toward their work: "*I also work towards HR. We have this one question that we ask every other week to measure temperature in the organisation. So I participate in finding out which questions we should ask and what is it that we are wondering about. And then I was taking part in making development discussions*" (Informant 8). The quote also suggests that agile coaches may take active part in development discussions with employees and thus participate in their career management. Another informant confirmed this. She was a head of a whole agile coaching unit and described that the unit was systematically increasing middle management's awareness of career paths for employees (quote 34). It thus appeared that some agile coaches were also taking part in personnel management.

Set-up work process. Many informants had authority to influence the way employees work, both within and outside teams. They emphasised the importance of changing "work processes" in order to achieve technological success with agile software methods. This is how one informant talked about it: "*In order for it to work, you need to make changes and actively work towards the organisation, how you organise work processes*" (Informant 5). An example of organising work in teams was establishing new teams and deciding how the team should work. Informant 12 was an experienced agile coach who helped her less experienced colleague to create a new team. Establishing team design and processes was important to help the team to self-organise in the future (quote 35). In such way the agile coaches affected team's composition and what competencies it possessed. Another informant described how he restructured a big team because of its low productivity. The team was not able to complete its tasks in time, which led the agile coach to break the team down in two smaller teams (quote 36). He then instructed both teams how to work with tasks in order to improve the performance. In this way agile coaches appeared to both create new teams and reorganize work processes in the existing teams.

Not only did an agile coaches instruct teams on how to work, but they could also influence work processes in the entire company. Informant 8 was one of the rare examples of an agile coache who decided which roles, responsibilities and routines her company needed to have in order to indeed be agile (quote 37). Essentially, she established a system of teams and decided how the emerging organisation should function in order to support them. This case illustrates that agile methods can guide young companies to build their entire organisational structure around the principles of agile software development. However, the activity of the informant in this case appeared to be more similar to leadership than to pure agile coaching. Later I will discuss whether Informant 8 can be called an "agile coach" in the same way as others.

Table 4

Practices and illustrative quotes associated with the theme Enterprise Agility

Practices	Examples	Illustrative quotes
Remove bottlenecks	Invite other teams' representatives to daily stand-ups, use stand-ups to detect team's dependencies, agile coach participates in creating onboarding process	**Quote 19** "Right now one of our biggest fights is <Team>. I actually have taken the time and I've gone to <Team> and said, "Can you please send one of your people to one of our stand-ups, at least two to three times a week? So we can we can collaborate and figure out how we're going to handle this data <…>" (Informant 14) **Quote 20** "When you go through the your daily stand-ups, you know, you identify your dependencies, and you kind of go from there. I try to identify those as fast as possible. And the reason why I do is so that way the team, you know, is still able to function as much as they can" (Informant 14).

		Quote 21 "I showed you a little chart earlier which I drew, on how you get more effective meetings. <…> So I felt that something that they…. Again, I very often heard the repeatedly "Meetings, there are so many meetings". And then I thought, maybe this is something I can make about it to remove this feeling that… that there are a lot of meetings. Can we maybe get to shift it to something positive that one sees meetings as a very good work form and such". (Informant 9). **Quote 22** "I say that I work with organisational pains, and this can be something else that what is directly linked to development. It can be onboarding of people, for example" (Informant 8).
Teach agile methods	Open classes on agile theory for the whole organisations or certain employee groups, develop existing agile competence of Scrum Masters and Product Owners in application to the organisation's context, agile coaches develop own competence on agile	**Quote 23** "One explains what agile is both from a theoretical perspective and also puts it in the context of <customer organisation>. Others are more like... So we ran someone how one breaks down tasks and how one prioritizes" (Informant 12). **Quote 24** "I have worked with senior leaders to come up with our agile transformation approach. As agile coaches we have the mandate to do education, coaching, mentorship, facilitation, and any type of other education or learning to help the organisation move forward in our transformation effort" (Informant 1). **Quote 25** "You need to develop your competence together with… How does one work, then? How is it one is a Scrum Master, how is one agile in our development context? And the experiences they have they share in the networks we have, for Scrum Masters and product owners" (Informant 11). **Quote 26** "Since the role is so fresh and unknown I have these weekly meetings with HR boss and my own boss where we discuss every Friday common problems linked to the role. <…> It is a lot to learn every day" (Informant 9).
Get everyone on the same page	Redefine agile values within respective organisational context, establish networks and common communication platforms, connect teams with similar challenges	**Quote 27** "We used a lot of time to agree on what we mean when we say agile. So that <organisation> has the same understanding of what agile means. So we have used a lot of time to form our own principles in relation to the <customer organisation>'s values and then examples of practices. So it was both lectures to explain what is agile from a theoretical perspective, but also what it means in <organisation>'s context" (Informant 12). **Quote 28** "We have this kind of demo every second week for the whole <organisation>, so everyone shows a little of what they work with. So this is what we steer" (Informant 8). **Quote 29** "<...> and in some cases, I might even hook them up later with other teams that have had similar struggles so they can talk to their peers about what happened, just letting them know they're not... They're not alone" (Informant 15).
Change organisational culture	Explain benefits of team culture to management, reduce sanctions	**Quote 30** "I ran a big battle with regard to going from thinking project culture to thinking team culture. So coach here in <organisation> has actually been much more to explain why... I mean the benefits so to speak of being a team and of understanding that you are a part of this unit" (Informant 6). **Quote 31** "It was a culture from before that if they estimated 100 hours and then used 102 hours, then someone came and beheaded them. So it was this culture that was changed" (Informant 11).
Coach leaders	Leadership training in "empowering" teams, "situational coaching" with leaders during meetings	**Quote 32** "We do leadership training, to help with the soft skills to transition from being a command-and-control leader to more of a leader that is empowering their team" (Informant 1). **Quote 33** "Sometimes it's just courses. But most of the time in my experience I am unable to do courses because the leaders don't have time. And spend those many hours. So the way I call it is situational coaching, which is in the middle in the meeting, I kind of speak up and say, can we do this? What do you think? And then one-on-ones. Get times with them" (Informant 13).
Collaborate with HR department	Development discussions with employees, make middle management aware of importance of the employee's carrier paths	**Quote 34** "We've been trying to help middle management understand the importance of career management. And we have a case study, I'll put it in this way, our example of where we have shifted one managers role to be... just focusing on the career development of three other teams, where before they were delivery manager" (Informant 1).
Set-up work process	Create teams, reorganise teams when needed, establish key roles and responsibilities to create an agile organisation	**Quote 35** "One <agile coach> is currently building up some teams. So it is a lot of discussions about how one best organises the teams, how can we best find a way for them to self-organise" (Informant 12). **Quote 36** "I took some small critical issues that we wanted to focus on and created a very small team. <...> The other team, I made one large team out of the remainder of the people that was around 14 people" (Informant 2). **Quote 37** "It has to do with building-up work processes, an agile organisation. So it has to do with, right, how we should organise ourselves, which roles we should have, how should we work and…

the process. It is kind of just a small part of it because it is many processes, you can say, in all that. So this is what I worked with the last year and a half" (Informant 8).

Better Products

«Create value» was an expression used by the majority of the informants. In line with the agile framework, the coaches saw their purpose in drawing teams' attention to the value of the product that was being developed. According to one of the informants, this value-based approach was contrasted by a more traditional «time to market» view, in which the value of the product is measured by the amount of time spent for its development: "*we must be working value-based and not so much result-based. Meaning which value we create for which user, and not so much like the number of hours used for X and Y*" (Informant 11). Many practices were thus supposed to increase teams' understanding of the product that they were developing and how to maximise its value for the client and the end-users. Some of the informants additionally interacted with the customers in an attempt to increase their understanding of the agile principles. This theme collects examples of practices that relate to these two outcomes (see Table 5 for the associated quotes).

Increase team's understanding of the product. The majority of informants talked about importance of the final software product and that it should be valuable for the market: "*Actually every organisation is known by the product. It is like Google. <…> Most people don't know that Google is run by Alphabet, they just know Google. <…> Yeah, so, it's the product that overrides everything*" (Informant 7). The hope to design better software solutions appeared to be a reason why many organisations desired to transition to a team-oriented product development model and the agile framework. Agile coaches in the sample thus worked to help teams understand the product and its value for the customer and the market. Some coaches meant such understanding was more important to address than the relationships between the team members (quote 38).

In order to increase awareness around the product's value, coaches made teams reflect on the customer's intentions for the desired functionality. One informant asked team members questions such as "what is the customer really asking for?" (quote 39). Another way to enhance product understanding was by training the Product Owner (PO), something that was a focus of almost all agile coaches interviewed. POs play a crucial role in connecting team and customer because these two sides often speak different languages and can misunderstand each other. One-on-one coaching sessions with POs were used by several informants to teach them about how to function as a link between the developers and "the business side" (quote

40 and 41). In addition, team members were often discouraged from direct communication with the customer. Instead an agile coach could instruct them to involve the Product Owner to converse on the team's behalf (quote 42). This is because PO should, according to the informants, function as a "technical filter" that adapts the client's needs to the team's workflow.

Coach business. Many informants acknowledged a need for agile coaching at all organisational levels, including not only the team and management, but also the customer. Involvement of business partners in the development process was described as crucial for the product's success: "*Business engagement is key. This definitely started out as IT-initiative. And we see the best results when we have business by their support and engagement. Having business leaders being able to advocate for this way of working and understanding why we do what we do, and the benefits that has had for their customers and then getting feedback at every level* <...>" (Informant 1). The quote reveals that business partners should understand the value of the agile framework for their own needs. Therefore, some agile coaches helped the customer understand iterative software development (work in sprints), teams' self-organisation and autonomy (quote 43). One informant used drawings to collaborate with the customer on prioritising the most important tasks that the team should focus on in order for the customer "to be happy right now" (quote 44). This is because with agile software development, the team delivers small parts of functionality frequently, and thus requires a relatively small number of tasks to work with within each sprint. This can be hard to understand for customers who rather wish to receive "everything" after a long period of time.

Table 5

Practices and illustrative quotes associated with Better products

Practice	Examples	Illustrative quotes
Increase team's understanding of the product	Make team reflect on customer's intentions	**Quote 38** "We want <...> teams that support their products. So we were doing less discovery around the people and their relationships and more discovery around the product, which is where the focus should be <...> And we're also trying to help discover what the people who are asking us to build, what they actually want" (Informant 4). **Quote 39** "And I said "What is she really asking for when she is asking for a screen change? It is not just how it looks. What is she really asking for? What´s the use of it? How is the user going to interact with it differently?" They didn´t know. They just stopped at the level that it is gonna look different on the other screens. And so by digging into finding out "What she was really asking for" that they could understand there is probably a workflow change or something that was not being satisfied in terms of the end user. So it was thinking deep" (Informant 2).
	Teach Product Owner to connect team and customer	**Quote 40** "The Product Owner <...> are the ones that need to be fully empowered so that they reach out to the business when they have something to discuss and share. Likewise, the business contacts the Product Owner directly if they have additional needs. <...> Well, what I try to instruct them… teach them about is the idea that they need to know, on the product perspective, everything that is going on. They need to know their product to be able to speak to it, they need to know

		about what is going on in the team, they need to understand in detail what the team needs from the business. If they make a request… if they want a new feature, for instance, they need to be able to know whom to ask…. in the team so the team will be able to prepare and deliver it. So they are fully capable and responsible for the product and the full communication" (Informant 2).
		Quote 41 "So I coach the Product Owner, and say, and I told him, you're the technical filter, you're the one that you know, they say, hey, I want a button and I want this button to do this. And you can be sure that when you go down to the team, you say, hey, team, for the business, we need to create a button, it needs to be able to do this" (Informant 14).
	Discourage teams from direct communication with customer	**Quote 42** "Instead of the business coming in and trying to you know, mingle with the teams. I teach them how to pull away and say, you know, Product Owner, you know, it's your job, to call the team, say, "Hey, what kind of information you need from there?" (Informant 14).
Coach business	Educate customers on agile	**Quote 43** «When I move towards the business, then I most of the time is helping them understand why and what... the "what" and the "why" of agile. Because in agile, we promote a lot of self-optimization, autonomy, which is new to leaders and manager. So I spend a lot of time teaching that» (Informant 13)
	Identify limited portion of highly prioritised functionality	**Quote 44** "When you're coaching the business, you got to make sure that you kind of go in and you know, more trying to help them and show them value in like, okay, so is there anything that I need to do for you? <...> what is it that we have to get done so you're happy? And sometimes they are like «Give me everything!» And you're like «Nope! Can´t give you everything?» So we are like making the drawings on the board, you can say, what is it right here that will make you happy right now? <...>". (Informant 14)

Comparative Analysis Between Norway and the USA

Table 6 shows differences in the frequency of thematic coding between Norwegian and US informants. There was no significant difference for the overarching themes. Furthermore, nearly all sub-themes of *Teamwork* were coded with similar frequency in the data from both countries. At the same time, Norwegian informants were slightly more often coded for the sub-theme *Support Product Owner and Scrum Master.* The sub-theme *Set-up work processes* was identified in the data from 5 Norwegian coaches, which is much higher than in the American sample (1 informant). US data were also slightly more often coded on *Coach leaders*, whereas Norwegian informants talked much more often about *Collaborating with HR department* and *Changing organisational culture,* than did their American colleagues. Finally, there was no Norwegian informant who was coded for *Coaching business*, although in the majority of American interviews this sub-theme was present.

Table 6

Country-specific differences in the frequency of thematic coding

Overarching themes	Sub-themes	USA (N=8)	Norway (N=7)	Total (N=15)
Teamwork		8	7	15
	Create awareness of the work process	4	6	10
	Help teams learn and adapt	6	7	13

	Promote good psychosocial environment	5	6	11
	Support Product Owner and Scrum Master	**3**	**6**	**9**
Enterprise agility		7	7	14
	Remove bottlenecks	3	4	7
	Teach agile methods	3	2	5
	Get everyone on the same page	4	4	8
	Change organisational culture	**0**	**5**	**5**
	Coach leaders	**5**	**3**	**8**
	Collaborate with HR department	**2**	**7**	**7**
	Set up work process	**1**	**5**	**6**
Better products		6	5	11
	Increase team's understanding of the product	5	5	10
	Coaching business	**5**	**0**	**5**
Total		8	7	15

Discussion

The purpose of this study is to describe how agile coaching is practiced in Norway and the USA. Therefore, I will now summarise the results of the thematic analysis which demonstrates how agile coaches work to improve *teamwork*, to achieve *enterprise agility* and *better products.* I will also summarise the results of comparisons between participants from Norway and the USA.

In the remaining parts of this chapter I will draw on the theoretical end empirical literature, presented earlier, in order to discuss the research question, specifically, which role agile coaches play regarding work in software development teams, organisational culture and leadership in their companies. In addition, I will argue that the demonstrated differences in the thematic coding between both countries may reflect the actual differences in agile coaching practices.

Summary of the Result

The seeming purpose of an agile coach is to help organisations adopt and effectively use agile software development methods. However, since this role is flexible in nature, it is nearly impossible to describe agile coaching in a way that would be valid for all contexts. An agile coach is meant to adapt to organisational needs. Therefore, the content of his or her work will (and should) always depend on particular organisational background. This section thus does not attempt to provide a universal account of how agile coaching is exercised, but rather gives a general idea of which areas *may* be impacted by an agile coach and how.

The results suggest that agile coaches interact with different aspects of the organisations, including teams, employees in various departments, several levels of management and customers. One can thus make a distinction between different levels of agile coaching: team coaching, enterprise coaching and customer coaching. Team-level agile coaches focus primarily on software teams, whereas enterprise-level agile coaches work mostly with agile education and management training. This distinction is, however, not always strict and in many cases one agile coach can be operating on both levels. Some coaches also work with customers to improve their understanding of agile methods. The data give indication that the purpose of this coaching is to increase the overall quality of software products by involving business partners in the continuous product development. I will now turn to the main results and present them according to the three overarching themes that resulted from the data analysis: *teamwork, enterprise agility* and *better products*.

Teamwork. The current results suggest that software teams are the main target of agile coaching. Team-level coaches may either be invited to improve agile competence in the

existing teams or be the ones creating new teams. Agile coaches help teams to monitor their work process by drawing attention to stressful aspects, such as workload. They also seek to improve teams' ability to collaborate by drawing attention to malfunctional interpersonal processes and suggesting ways to improve them. In addition, coaches may initiate exercises that raise team members' awareness of their roles in the team and what their common goal is. Teams are encouraged to agree on what they can and cannot expect from each other.

Agile coaches make teams reflect on different aspects of their planning and teamwork. The purpose of this is to help teams learn and better adapt to the changing circumstances. The majority of agile coaches conduct regular retrospective meetings where teams are invited to evaluate how they have worked since the last "retrospective". During such evaluations, agile coaches encourage team members to think broadly and try innovative solutions. They also make sure that such evaluations result in concrete suggestions on what team thinks should be improved and how. The suggested improvements are subsequently followed-up by agile coaches, thus helping teams be consistent with their own decisions.

Assuming that one performs best in a safe learning environment, agile coaches develop a supportive psychosocial climate, which is supposed to boost creativity in development teams. They encourage constructive dialogue to increase mutual trust among the team members. At the same time, agile coaches make sure individuals are enthusiastic about their work.

Close attention is also paid to the ability to plan and prioritise work, which within the agile framework is normally delegated to the Product Owner. Agile coaches spend a considerable time on individual sessions with Product Owners, improving their ability to collect information about the product under development, prioritise tasks and facilitate the team's own planning through the agile rituals.

Enterprise agility. The results suggest that agile coaching is also practiced outside software development teams. Enterprise-level agile coaches synchronise various organisational units and management in their understanding of how agile methods best work in the context of their organisation. Where possible, agile coaches seek to identify and remove dependencies between teams. Their work increases people's overall competence in agile methods through classes for both personnel and management. Furthermore, it stimulates communication and sharing of experience across different departments and groups of employees. Agile coaches were the ones who often guarded organisational culture against excessive top-down control and sanctions. Some coaching focuses on training middle and sometimes top managers in an attempt to make their leadership style less controlling and more

"empowering". In addition, agile coaches collaborate with HR departments and sometimes have overlapping functions in that they plan recruitment strategies and the career paths of the personnel. Finally, they may set up work processes by, for example, establishing software teams and deciding who will be part of these teams.

Better product. An idea behind the agile philosophy is to improve software products through better collaboration between developers and customers. The current results demonstrate how agile coaches make teams reflect on the value of the developed products. The findings also offer insight into how agile coaching increases customers' acceptance of the agile approach through informing and collaborating with them on continuous planning of the desired software.

Differences between Norwegian and US informants. Comparative analysis of the frequency in thematic coding indicates that team-level coaching is practiced in similar ways both in Norway and the USA, since all sub-themes of *teamwork* were observed equally frequently. However, there were several differences in the theme *enterprise agility*, which suggests that agile coaching at the enterprise-level is practiced differently in the two countries. Even though there were fewer enterprise-level coaches in Norway, they seemed to have more authority in comparison to the enterprise-level coaches in the US. Specifically, Norwegian agile coaches reported having broader responsibilities associated with personnel management (e.g. onboarding, recruitment, development conversations with employees) and sometimes functioned similarly to leaders. Furthermore, Norwegian agile coaches seem much more concerned with organisational culture and personnel management than their American colleagues. US-based agile coaches, in contrast, appear to train managers slightly more often than do their Norwegian practitioners. Another apparent difference was that American agile coaches reported that they were involved with the clients helping them understand the value of agile methods, whereas no Norwegian coach described that.

Now that the main findings have been summarised, I will in the next section discuss them in light of other empirical findings on agile coaching and the theoretical literature, presented earlier.

Improving Teamwork Through Agile Coaching

The findings on the role of the agile coach in software teams are consistent with earlier findings that agile coaches enhance teams' sharing, discussing and exploration (Bäcklander, 2019). It was also found earlier that agile coaches improve teams' planning by supporting the Product Owner (Bäcklander, 2019). One can thus expect agile coaching to increase the quality of teamwork, which is one of the intentions behind hiring an agile coach.

Acknowledging this, I will now offer a theoretical perspective on the effects of agile coaching on team performance by discussing the current results in light of the teamwork literature, introduced earlier.

Findings in light of the teamwork components. The results indicate that agile coaches increase teams' shared understanding, communication and mutual trust. Similar aspects have been described by Salas et al. (2005) as coordinating mechanisms of teamwork. I will now discuss how the findings relate to these mechanisms in detail. After that, I will focus on the role of the concept of team adaptability in agile coaching, as it appears that this component of teamwork is the most central coaching area in agile teams.

Shared mental models. The findings reveal that agile coaching activities help teams understand the common goal and what team members can expect from each other in terms of performance. Exercises such as "team canvas", where developers are encouraged to discuss their roles and common work rules, offer the opportunity to reflect on the work process and to better understand each other's contributions. Using terminology from the teamwork framework (Salas et al., 2005), it seems that agile coaching provides team with training in shared mental models. Given that shared mental models have been found to be beneficial for team performance (Mohammed et al., 2000), agile coaches who boost a team's understanding of their goals and rules may improve teamwork in software teams.

Communication. Many agile coaches apply digital tools in order to help teams visualise their work flow. The usual goal is that each team member has access to the information on the work progress in the whole team at all times. In this way everyone in the team is informed on what others are working on. Such digital visualisations contribute to redundancy in the team's communication and information flow, which, according to the research, may improve performance in teams (Morrissette et al., 1975). Furthermore, some findings suggest that, under pressure, verbal communication in teams can be less effective than non-verbal (e.g. figures and charts) (Cannon-Bowers et al., 1990). Visual non-verbal representations of the workflow that agile coaches introduce may thus facilitate the team's communication also when the work load is high.

According to Salas et al. (2005), closed-loop communication is crucial for teamwork, since it allows team members to make sure that they understand each other's input. However, agile coaches in the current study did not seem to train teams in closed-loop communication. This may mean that such communication is not as central for agile teams as redundant communication. At the same time, there is a possibility that agile coaches should pay more attention to training teams in closed-loop communication if they notice a need for it.

Mutual trust. Trustful relationships within teams was a major focus of the agile coaches in the study. The level of trust could be increased by activities that helped to agree on a common set of work rules, as such rules allow for justified expectations of the behaviours of others. Mutual trust is considered decisive for a team's successful coordination and functioning, allowing team members to share inputs freely and willingly (Salas et al., 2005). Moreover, a trustful environment in-team should make team members more open to monitoring each other's feedback and to offering help (back-up). Salas et al (2005) predict that performance feedback and back-up behaviour should lead to increased performance in teams. Therefore, agile coaches who make team members' relationships more trustful can contribute to their success.

Adaptability. The results indicate that agile coaches invite teams to reflect on their work processes in order to better learn and adapt. Salas et al. (2005) consider adaptability one of the five components of teamwork. According to the proposition of Priest at el. (2002), adaptable teams may be likely to successfully cope with workload and time pressure. Moreover, team adaptability can be increased by, for example, mutual feedback on the work process (Priest et al., 2002). When coaches open up for a team reflection on their past performance during retrospective meetings, they create opportunities for such a feedback. A field study of 46 cross-functional teams revealed that reflecting about a task after completing it leads to increased learning and performance in the teams (De Dreu, 2007). Agile coaching may thus be beneficial for teams' adaptability and subsequent ability to cope with stressors.

The concept of team stressors should be additionally discussed with regard to the findings. Many agile coaching activities draw the team's attention to their workload. The goal is to teach teams how to regulate their current workload, since excessive workload is described as stressful and impairing for interpersonal relationships and interaction within the team. Factors such as workload are sometimes described as team stressors (Priest et al., 2002). Research has shown that stressful situations may impair team performance due to, for example, team members ignoring each other's input (Driskell & Salas, 1992). It may thus be advantageous for software teams to receive training on how to control their workload, which can potentially increase their performance.

If I now turn to the agile coaching model of Hackman and Wageman (2005), I will be able to discuss how findings on agile coaching can be understood with regard to the organisational context of the agile teams.

Findings in light of the team coaching model. According to the team coaching model of Hackman and Wageman (2005), coaching has the strongest effect on a team's

success when it addresses the team's effort, strategy or knowledge and skills. The current results suggest that agile coaches address all three of these aspects. Agile coaching seeks to motivate software teams to be successful problem-solvers and stay engaged with their work. Teams are also invited to reflect on their teamwork and to negotiate how best to address the challenges identified in the work process. Agile coaches develop teams' overall knowledge and skills by informing team members on agile methods. The suggested team coaching model can thus be successfully applied to understand agile coaching.

One of the strengths of the model is that it describes how aspects of team context, such as team composition and organisational constraints, relate to its coaching. I have therefore chosen to address these two aspects and their relation to agile coaching.

Team composition. The team coaching model predicts that the effect of coaching on a team's performance will depend on aspects of team design, such as team composition (Hackman & Wageman, 2005). Given that many agile coaches appear to have authority to influence the team's composition, they may enhance the effects of their own coaching. For example, some agile coaches in the current sample created software teams by nominating team members and deciding over the team size. If agile coaches succeed in creating a team with a good design, one can indeed expect that in such teams both the effect of agile coaching and performance will increase. However, the concept of team design is often multidimensional. Wageman (2001) operationalised it in terms of both team composition (number of team members or their skills) and organisational variables (available information, resources, task complexity). It is therefore unclear whether agile coaches can expect to improve a team's overall design, and eventually performance, by influencing team composition alone.

Organisational constraints. The results of this study demonstrate how agile coaches set up necessary information flow between the coached team and other teams and departments. The improved information flow may reduce teams' dependencies and thus eliminate the surrounding organisational constraints. According to Hackman and Wageman (2005), organisational constraints can eliminate the positive effects of coaching on team performance. Therefore by reducing dependencies, agile coaches can make their own coaching more effective. However, the direct link between necessary information provided by the organisation, and team performance has not been empirically confirmed (Wageman, 2001). Magpili and Paroz (2018) suggest that good information flow is required for improved decision-making and innovative thinking in teams. The link between sufficient communication to the outside of the team and the team's performance may, therefore, be

indirect. Accordingly, agile coaches may indirectly improve team performance by facilitating its communication with other teams and departments.

So far in this sub-section, I have argued that agile coaches can improve performance of software development teams because their activities contribute to several outcomes that, according to the teamwork literature, lead to successful coordination and decision-making in teams. In addition, agile coaches can make their own coaching more effective if they are able to influence the context around the development teams, such as team composition and organisational factors that constrain work in the agile teams. In the next sub-section, I turn to the relationship between agile coaching and organisational culture.

Findings in Light of Organisational Culture

The results of this study suggest that agile coaches have a strong influence on the organisational context of the companies where they work. Among other things, they try to reduce top-down control and sanctions to make organisational culture more agile-friendly. This inspired me to look at these findings in light of the presented literature on organisational culture. In this section, I show how the practices of an agile coach can change different components of organisational culture to make employees and managers behave in a more "agile" way. I start by incorporating my results in an empirical context by comparing them to previous findings on enterprise-level agile coaching.

Other findings on enterprise-level agile coaching. Prior to this piece of research, agile coaching was primarily associated with software development teams (Bäcklander, 2019). The current results offer an insight into how agile coaching can be practiced at organisational level, which is rarely addressed in the literature. Research on the implementation of agile methods suggests that organisations may often constrain teams who wish to adopt them (Conboy & Carroll, 2019; Fuchs & Hess, 2018). However, few studies specifically explore the role of agile coaching in this mechanism. Parizi et al. (2014) found that agile coaches can suggest adjustments to provide a better fit between organisations and the adopted agile practices. Agile coaches at Ericsson also spent considerable time on customising the agile approach to better fit the organisation (Paasivaara et al., 2018). The current results are consistent with these findings. They show that agile coaches indeed play an important role in customising agile methods to organisational contexts. Moreover, the results give an insight into how agile coaches synchronise employees, departments and management in their understanding of how agile methods best work in the context of their organisation.

The goal of agile coaching as it appears in this study is to promote behaviours and reactions that are in line with the agile framework. It appeared from the result that in order to

do that, agile coaches had to change the entire organisational culture. They seem to transform organisational norms, values and rituals in order to change employees' work practices. Many informants were aware of their role as "culture change agents". It thus seems reasonable to discuss the findings on enterprise-level coaching in relation to the Schein's model of organisational culture that links behavioural norms, values and rituals to employee behaviour (Hogan & Coote, 2014; Schein, 2010).

Agile coaching and Schein's model of organisational culture. According to Schein's model of organisational culture, employees' behaviour is related to the kind of values, behavioural norms and observed artefacts in the company (Schein, 2010). As mentioned above, agile coaches from this study promoted organisational behaviours that are compatible with the way agile works. Examples of such behaviours could be frequent exchange of experience between organisational units, decreased manager control over developer teams or adoption of new tools and work processes. Agile coaches also introduced and sustained cultural artefacts that supported the agile behaviours. This could be specific roles (e.g. Product Owner) and ceremonies (such as stand-ups and retrospective meetings). According to empirical findings, change in both norms and artefacts can promote a related change in employees' behaviour (Hogan & Coote, 2014). One may thus expect that agile coaches who establish agile-friendly behavioural norms and rituals, can successfully make employees behave in a way that is in line with agile methods. In addition, agile coaches promoted the norms of trustful communication in the development teams. The norm of supportive communication was shown to improve success in the agile teams (Stray et al., 2016). The change in organisational culture that is promoted by agile coaches at team level can thus be beneficial for the employees' performance.

Many informants in this study held courses and workshops on the agile software engineering methods and how it affects project management. These platforms were used to explain the reasoning behind the agile artefacts and how exactly agile practices may be beneficial for this particular organisation. In this way agile coaches could influence organisational values by making them more aligned with the values of agile thinking, such as continuous learning, team authority and collaborative decision-making. The data gives impression that the informants were more concerned with changing the «*people's mindset*» and «*pattern of thought*», rather than changing their actual behaviour. This may be interpreted as support for Schein's layered structure of organisational culture where the values and implicit assumptions are more fundamental than the artefacts. As stated by Beck (2000), if a company's climate is characterised by secrecy, complexity and isolation, introduction of work

practices with a set of opposing values may cause trouble rather than leading to success. Agile coaches who both focus on agile ceremonies and promote the underlying agile values, should thus be likely to maximise the positive effects of implementing the agile methods.

On the other hand, the interviews made it evident that changing people's underlying values and assumptions was a difficult and lengthy endeavour. As described in the section "Informants' context", it was a big challenge to change people's habits and attitudes (or "mindset"), which could often result in so-called "fake agile". In companies with "fake agile", teams were allowed to perform agile ceremonies but could not exercise their autonomy and decision-making practically in the way that is recommended by agile methods. The results indicated that one reason for this was rooted in the organisational values required by the agile thinking. Such values should include low managerial control, flexible planning and lack of sanctions. Therefore, an organisational culture of the companies with "fake agile" was able to change on the surface (agile artefacts and ceremonies), but not in depth (values of autonomy and innovation). In other words, agile ceremonies and norms, when introduced in development teams, are of little worth in companies where employees and managers do not think "in an agile way". This corresponds well to the reasoning of Schein, who describes organisational culture as stable and deep, meaning that it is hard to change, partly because of its implicit character (Schein, 2010). If the introduction of agile methods indeed needs to be accompanied by a change in the underlying organisational culture, the process is likely to demand considerable effort and time, which organisations should be well aware of.

In summary, I have shown that agile coaching can be studied through the lens of the concept *organisational culture*. Agile coaches can promote the implementation of agile software development methods by promoting change in different components of organisational culture. The majority of coaches introduce agile artefacts such as *retrospective* and *stand-up* at team level. However, changing the artefacts may not be sufficient to promote agile, as this only transforms the surface of the organisational culture. Moreover, changing only the surface level may lead to negative consequences such as "fake agile". Therefore, it is crucial to combine the agile ceremonies with activities that change the underlying organisational values. This means that enterprise-level agile coaching with classes for employees and managers is beneficial for the adoption of agile methods. Related to this, I will now discuss how agile coaching can make leadership more agile-friendly by looking at the findings from the *transformational* and *transactional leadership* perspectives.

Agile Coaching and Transformational and Transactional Leadership

According to the current results, agile coaches strive to create an organisational environment that encourages collaboration between individuals, teams and units. Strong focus is on forming common values, rather than strict rules and discipline. The coaching seems to promote leadership behaviour that manifests less control and more "empowerment" of the team's own decision-making and problem-solving. Managers are taught to decrease their degree of control and attend to employees' needs for personal growth and development instead. Such "empowering" leadership behaviour resembles the transformational leadership style as described by Bass and Avolio (1994). Accordingly, the culture that agile coaches seem to promote has characteristics of transformational organisational culture (Bass & Avolio, 1993).

Findings in light of transformational and transactional leadership and culture. If the transformational behaviour of leaders can indeed lead to organisational cultures with transformational characteristics, it appears meaningful that some agile coaches focus on coaching top- and middle management. By encouraging managers to adopt more transformational behaviour, agile coaches may start the mechanism of changing the organisational culture from within. Transformational leadership is often associated with employees' organisational commitment and job satisfaction (Choi et al., 2016). Therefore, agile coaching may indirectly lead to more committed and happy employees at their organisations. This can happen if the coached leaders start to focus less on discipline, control and hierarchical planning and more on common values and vision. In such a way the transactional characteristics of the culture may decrease over time, whereas transformational characteristics become more prominent.

Transformational organisational cultures appear to be well-suited for innovative companies who wish to enhance their employee's creativity, collaboration and problem-solving (Sarros et al., 2008). Agile methods also require the kind of context that supports flexible thinking, cooperative teamwork and innovative approaches to problems. Based on their examination of 9 software projects in the UK and New Zealand, Strode et al. (2009) concluded that organisations that value such aspects as teamwork, face-to-face communication and interactive learning, often adopt agile methods. Therefore, agile software development seems to be compatible with transformational cultures as described by Bass and Avolio (1993). It thus makes theoretical sense for agile coaches to promote organisational environments with transformational characteristics. Some empirical findings also seem to support this reasoning. For example, van Kelle et al. (2015) reported that the level of

transformational leadership had a stronger effect on success in agile projects even compared to other characteristics of the project (e.g. the project's size).

According to the framework proposed by Bass et al. (2003), organisational cultures cannot and should not be fully transformational. Some transactional characteristics are required for optimal performance, since transactional leadership specifies employee's expectations, clarifies responsibilities and provides recognition for achieving the expected performance (Bass et al., 2003). At the same time, it may appear that one purpose of agile coaching is to convert management into following a purely transformational style. If this impression is correct, such purpose should be seen with caution. No organisation can survive in the absence of transactional management. While transformational leadership may lead employees to higher achievement in the existing settings, transactional leadership serves as a mere foundation for work and performance.

Are agile coaches transformational leaders? So far I have discussed how agile coaching may influence other leaders. But can agile coaches themselves be considered transformational leaders? They seek to make developer teams more enthusiastic about their work, which resembles *inspirational motivation*. They also manifest idealised influence in that they base their activities on a set of underlying values of agile. They encourage exploration and creativity and function as facilitators for people they coach, something reminiscent of *intellectual stimulation*. In line with this, it is reasonable to discuss to which extent agile coaches are also leader figures. Bäcklander (2019) studied agile coaches in Spotify from the leadership perspective and argued that agile coaching is an informal form of team leadership. She suggested that agile coaching is a leadership "inside out" that micro-manages software teams by helping to create their own set of guidelines for common work. Rather than complying with organisational regulations, which would be more in the spirit of transactional leadership, agile coaching helps teams to acknowledge the need to create their own set of guiding principles. The difference is that such principles can be adjusted at any time, which is more in line of transformational cultures that focus on general behavioural norms and values, rather than on rigid rules and sanctions for violating them. In this sense, agile coaches can be compared to leaders with transformational characteristics. At the same time, they usually avoid supervising their teams and do not motivate them by *contingent reward*. This indicates that agile coaching as a figure shows very few transactional behaviours and thus should not be compared to managers of the traditional command-and-control kind.

The purpose of this sub-section was to discuss agile coaching in relation to transformational and transactional leadership. Agile coaches train managers to be less

controlling and to attend to their employees' personal growth, which I compared to transformational leadership behaviours. I suggested that leadership training sessions provided by agile coaches can contribute to work environments with more transformational and less transactional characteristics, which should be beneficial for the implementation of agile methods. In addition, I concluded that agile coaches can be seen as team leaders in the transformational, but not so much in the transactional sense. The following part of the discussion focuses on the possible differences in agile coaching between Norwegian and American practitioners.

Different Agile Coaching in Norway and the USA?

According to the current findings, the Norwegian agile coaching style may be more concerned with changing organisational culture and psychological work environment, whereas US practitioners may focus more on coaching management and business partners. These results should be interpreted with caution, since the comparative analysis is merely explorative in nature and is based on the qualitative categorisation of data. However, the suggested differences make sense in light of the cultural contrasts between Norway and the USA. In this section I argue that the results may reflect the actual variation in agile coaching because of the cultural differences in understanding work environment, focus on individual leaders and in market orientation.

Focus on work environment. Norwegian agile coaching seems to be characterized by more focus on personnel management and organisational culture than in that in the USA. These results may make sense, given that work life is the Nordic countries is traditionally more attentive to the quality of work environment (Christensen et al., 2017). Norwegian practitioners may thus perceive agile tools as a way to promote a more positive work climate for the employees. Norwegians also seemed to be more active in promoting agile-related culture change in their organisations. One suggestion may be that since large-scale application of agile methods still remains relatively new to Norwegian companies, the practitioners need to apply more effort to implement agile culture than their US colleagues. Another explanation can be linked to the different perspectives on leadership in the two countries, which stem from differences in level of individualism at the workplace.

Individualism versus cooperation. Since work culture in the US is more individualistic than in Norway and has stronger focus on single leaders (Birkelund & Sandnes, 2003), agile framework may be promoted primarily through changing attitudes of individual managers. It appears that coaching of top- and middle managers is more central for the informants from the US compared to their Norwegian colleagues. This may be explained

by the cultural differences in the understanding of leadership. In Norway, where occupational values are less individualistic with more attention paid to cooperative work designs, agile coaching is less focused on changing the behaviour of particular leaders. Instead, Norwegian practitioners are more concerned with changing routines and rituals in order to achieve more agile organisational culture.

Market orientation. Another finding is that American agile coaches were more involved with their business partners than those from Norway were. Empirical findings show that clients can often be sceptical towards agile development because it is both unknown to them and gives less predictable results compared to the traditional long-term planning approach (Conboy & Carroll, 2019). American agile coaches seem to play a crucial role in maintaining long-term relationships with clients. However, no interaction with customers was mentioned by Norwegian informants. This may reflect higher awareness of the customer's centricity among the US-based participants. Since American labour is traditionally more liberal and more market-oriented, than in social-democratic Norway, agile coaching practices there may also be more focused on creating competitive software products and maintaining relationships with the customer.

In summary, the observed difference in agile coaching practices may reflect the actual differences in agile coaching between Norway and the USA. Because Norwegian work life is more characterised by attention to work environment and cooperative leadership, agile coaches may focus more on improving work climate and values and not so much on changing concrete leaders, as was the case in the USA. At the same time, American practitioners may be traditionally more sensitive to the needs of the market, which may explain why the informants from the US worked more with business partners in comparison with their Norwegian colleagues.

Now that the main findings have been discussed, I will outline their implication for software development organisations.

Practical Implications

The methods of this study are rooted in the participatory paradigm that inspires researchers not only to develop theoretical insights, but also to solve practical problems (Mathiassen, 2017). In line with this paradigm, this section contains practical recommendations based on the results and reasoning in the current study. The recommendations are linked to work teams, to organisational culture and leadership in organisations who wish to implement agile methods. I will also address recommendations for practitioners in Norway that are informed by the conclusions of the comparative analysis.

Teamwork. Following the reasoning of this study, agile coaches may improve teamwork in software teams. Agile coaching may thus be a valuable asset for companies who have work teams. Since agile roles and ceremonies provide general support for product development and do not necessarily have to relate to software engineering, agile coaching may be potentially employed also in other sectors where teams develop products (for example design or architecture). Another implication of the study is that agile coaches should not be expected to achieve sound results in companies that are not ready to adjust to the needs of their teams. Today many agile coaches can to some extent regulate design of the coached teams and reduce organisational constraints surrounding their work. This is positive for successful coaching, as its success is largely dependent on the organisational context and how the teams are arranged. However, not all organisations provide their agile coaches with sufficient authority, which reduces the effect of agile coaching and even puts them under pressure. Without being able to change the organisational context, agile coaches sometimes cannot assist their teams in demonstrating their full potential.

Organisational culture. Related to the previous paragraph, agile coaching seems to be beneficial when it addresses the entire organisation. Agile software methods cannot be applied only in one isolated team because by their nature they often require different organisational procedures, modes of interaction and, not least, values. Therefore, the use of agile methods may require a change in the organisational culture. This kind of change is a lengthy process which can be especially challenging for organisations with numerous regulations, a high degree of control and no habit of collaboration. Such organisations should be cautious in their choice to hire an agile coach, since the effects of agile coaching in highly structured environments may be limited.

Another implication of this study is that an introduction and use of agile ceremonies and roles does not necessarily lead to the desired success in teams. If the attributes of agile software methods are not supported by understanding of their value among employees and managers, the effects of the implementation may even be the opposite of what is desired. Therefore, a change in concrete working procedures should be accompanied by a related change in organisational values.

Leadership. If organisational environments with high degree of structure are not recommended for agile coaching, it can be well compatible with cultures that value innovative thinking, interactive collaboration and personal development of their employees. In other words, one can expect that the effects of agile coaching in cultures with prominent transformational characteristics will be the highest. One way to achieve such organisational

characteristics is by training management in transformational leadership style. Many agile coaches from the current study did provide leadership training, but not all. Organisations with the intention of adopting agile methods may thus be recommended to combine agile coaching in teams with agile coaching of management.

Many agile coaches appear to promote transformational leadership that is highly in line with the principles behind agile software development. However, this leadership style cannot exist without its transactional "relative". Transactional leadership is a foundation of organisational structure that sets expectations to employees and provides recognition for their work. Agile practitioners should thus be mindful in their attempts to make management purely transformational, which appears both detrimental and, of course, impossible.

Recommendation to Norwegian practitioners. Based on the identified differences in agile coaching between Norway and the USA, agile coaches in the latter seem to provide their organisations with a smoother implementation of agile methods than Norwegian coaches, since they have a stronger focus on training managers. In Norway, it was only in big companies that agile coaches seemed to be working with leaders. At the same time, the leaders are to understand agile methods in order to lead agile teams and organisations. Norwegian practitioners may, therefore, be advised to increase their attention to the training of management.

According to the current results, Norwegian agile coaches focus less on guiding their customers than their American colleagues do. However, adoption of agile methods may often require that the customer understands and supports this mode of software development. Norwegian practitioners may thus be encouraged to apply more effort to more involve their customers in the product development process by providing more guidance in agile practices and values.

I will now turn to the implications of this for further research.

Further Research

This study is an attempt to link empirical knowledge on agile coaching to organisational-psychological theory. This theoretical foundation can guide further research on agile coaching and implementation of agile methods at large organisational scale.

Since agile coaching is initially a form of team coaching, it is often assumed to improve the quality of teamwork and teams' success. However, there is little empirical evidence that supports this assumption. I have proposed that agile coaching can affect team performance by, for example, developing shared mental models, encouraging redundant communication and reducing team stressors. These propositions may be further examined in

the future. Additionally, it is possible to explore the potential effects of agile coaching outside software development. Since agile ceremonies and roles are rather generic and do not necessarily have to do with software engineering, one may test whether agile coaching may improve teamwork also in other domains.

This study suggests that apart from developing software teams, agile coaches may also develop organisations. Enterprise-level agile coaching is not yet well understood and requires further examination. This study made several propositions about how agile coaching and implementation of agile methods may relate to organisational culture and leadership. For example, it may be easier to adopt agile methods in the contexts with high level of transformational leadership. Besides, agile coaching may be more beneficial in such environments compared to organisational cultures with a high degree of structure and control. Finally, one can expect that agile coaching of managers will lead them to adopt a more transformational leadership style. All these propositions are suitable for further investigation.

To my knowledge, the current results are the first attempt to compare agile coaching in Norway and the USA. The presented comparative analysis has, however, a merely explorative character. The observed difference in how agile coaches address organisational culture, customers and coaching of leaders should be validated by the future research.

Strengths and Limitations

I now turn to the evaluation of different aspects of the presented study that can be considered either its strengths or limitations. These aspects are primarily linked to the chosen study design, data collection and data analysis.

Study design. The strength of this study is that it offers a thorough account of how agile coaching is practiced, which is acquired inductively. In other words, my initial analysis of the data material was not constrained by theoretical concepts, which allowed agile coaching to be described in its breadth and to discover aspects of agile coaching that were not known from before. Specifically, the role of agile coaches in organisational development and relationships with clients became more apparent. My choice of the inductive approach was guided by the research topic itself. Since agile coaching is not well studied, it was appropriate to approach it inductively. In this way the current study shows coherence between the research topic and the methods applied to answer it. According to Yardley (2015), such coherence is one way to demonstrate the validity of a piece of qualitative research. However, exactly the breadth of agile coaching as a phenomenon makes it hard to study theoretically. Since agile coaching relates to so many aspects of organisations, one may rely on several theoretical frameworks to examine it. I chose to look at it through the lens of organisational

culture and leadership, since these concepts appeared central for the current analysis results and originated from my field of study. However, I acknowledge that other theoretical backgrounds can be used, if different aspects of agile coaching are to be addressed.

Another strength of this study is that it is interdisciplinary in nature, meaning that it seeks to address phenomena of software engineering from the perspective of organisational psychology. Such an approach may be beneficial, offering new perspectives for the both fields. For example, theoretical insights from this study can be applied by both practitioners and researchers in the field of software engineering. The practical importance of a qualitative research, speaks for its quality (Yardley, 2015), which is why interdisciplinarity should be considered the study's strength. At the same time, my background in organisational psychology should be taken into account, as it inevitably influenced my interpretation of the software engineering context. Specifically, the informants did not explicitly state that the purpose of agile coaching was to change organisational culture or make leaders have a more "transformational" style. The link between the studied work practices and psychological concepts such as organisational culture and leadership is a result of my interpretation. At the same time, subjective interpretations are inseparable from qualitative research and should not be considered limitations, as long as they are explicitly acknowledged (Yardley, 2015). My perspective on agile coaching as an organisational psychologist, should thus not be problematic.

Data collection and informants. Even though I was the one who transcribed all the interviews, some informants from the US were not interviewed by me. Data from the US informants was collected either by my co-supervisors alone or with me as a co-interviewer. This could have affected the data material, as in some American interviews I was not always able to ask follow-up questions or address some topics in detail. Therefore, my interpretations of such data had to rely more on my or my co-supervisor's interpretations than in the cases where I did participate as an interviewer. This consideration should be taken into account especially when interpreting the comparative analysis between Norway and the USA. Some of the reported cultural differences may be due to different data collection procedures in the respective countries. However, all informants were asked a very similar set of questions as all data collectors relied on the same interview guide. The mentioned country-specific differences in the data collection should, therefore, be minimal.

Another consideration related to collection of data is linked to the participants. The study makes conclusions based on a sample of very different informants. Not only did they have different backgrounds and work in companies that varied significantly in size, but they

also had different roles in their organisations and even represented different counties. For example, Informant 8 appeared to function more like a leader than like an agile coach, which makes it difficult to compare her account with the other ones. However, the wide range of the informants' backgrounds might, in fact, be another strengths of this study if we consider its purpose. According to Yardley (2015), if one's intention is to study an unknown phenomenon, the informants' characteristics should vary in order to demonstrate a sufficient variety of contexts. Since the purpose of the study was to examine a relatively unknown role of agile coaches, the variation in the sample should be considered this study's strength. Future researchers should, however, be aware that the degree of leadership responsibilities among different agile coaches may vary a lot.

The last consideration linked to the informants is that the majority of agile coaches from the USA were employed in the same company. Therefore, the specific context of this company inevitably affected my conclusions about US agile coaching. The current findings on US agile coaching cannot be generalised to all US companies. At the same time, generalisability should not be a purpose of a qualitative research. Yardley (2015) argues that while generalisability is a traditional quality mark of quantitative research, it is impossible to expect qualitative findings to be generalisable. Instead, a qualitative researcher can hope that his insights may be useful in similar contexts. The main contextual characteristic of all US informants was the size of their companies. All the companies could be characterised as big (29 000 to 210 000 employees). The current insight on agile coaching in the US may thus be especially useful in big organisations.

Data analysis. I chose work practices as the main unit of the qualitative analysis. Nevertheless, there is a wide range of different definition of "practices", where some address only concrete actions and others also include the aims of the actions. My understanding of practices during the analysis process was closer to the latter, as it makes little sense to study what agile coaches do in the absence of connection to why they do it. For example, if a coach facilitated meetings, it was crucial to know what exactly she desired to achieve by the facilitation. This understanding of work practices should be taken into consideration when interpreting the current findings. At the same time, I provided a thorough description of my analysis method along with the reasoning behind the methodological choices I made. Such description should contribute to the transparency of this study, which is, according to Yardley (2015), a sign of the validity of qualitative research. The transparency of the data analysis is therefore another strength of this study.

This comparative analysis of agile coaching practices in Norway and the USA has only an explorative character and does not pretend to fully represent agile coaching in the respective countries. Moreover, some differences may be partly due to many agile coaches in the Norwegian sample having actual managerial and/or personnel responsibilities in addition to agile coaching. Even though the work title of all Norwegian informants was “agile coach”, some of them more resembled leaders who also promoted agile. One can thus raise the question of to which extent Norwegian and US agile coaching can actually be compared. The fact that the role of the agile coach in Norway is not always well distinguished from that of leader could contribute to the impression that agile coaching in Norway is more personnel-oriented than in the US.

Conclusions

The purpose of this study was to examine how agile coaching is practiced in Norway and the USA and to offer an organisational-psychology perspective on the role of the agile coach. After looking at agile coaching through the lens of the literature on teamwork, organisational culture and leadership, I can conclude that organisational-psychology theory can be successfully applied in order to understand and study agile coaching. In general, agile coaches play a more important role in their organisations than was previously assumed. In addition to working with specific software development teams and improving the quality of software products, they seem to also promote the agile principles by changing organisational culture and influencing the leadership style of concrete managers. Looking at how agile coaching is practiced through the lens of the existing teamwork theories, I concluded that agile coaches may increase the performance of software teams and all teams that develop products. Moreover, this role appears to have a strong influence on organisational culture, attempting to transform peoples' habits, expectations and values according to agile thinking. Agile coaches who train leaders seem to promote leadership behaviours that resemble the transformational style, which I suggest may help organisations successfully implement and use agile software development methods. This study indicates, further, that agile coaching in Norway may focus more on quality of work environment and less on working with particular managers and business partners, compared to how it is practiced in the US. Norwegian agile coaches may thus be recommended to attend more to leadership and customers. Other practical implications invite organisations to consider the potential pitfalls of agile coaching, and what should be in place to draw the most benefits from it. The study calls for more attention to be paid by organisational psychologists towards the phenomenon of agile coaching, which can be successfully used to acquire more empirical knowledge on teamwork, organisational culture and leadership.

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Appendix A. Principles behind the Agile Manifesto

(https://agilemanifesto.org/principles.html)

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

Appendix B. The interview guide

Practical details

- Present ourselves and the project
- Thank you for participating
- Confirm confidentiality and anonymity. Inform about privacy and voluntary participation. The publication will be supported by quotes and statements. Information from the interviews will be used as empiricism in order to answer the research questions of the project. Your personal information will be treated confidentially, and in the thesis, you as a respondent will be anonymised. Participating in this interview is voluntary, and your consent can be withdrawn at any time
- Inform about use of audio recordings
- Ask the respondent if use of tape recorder during the interview is accepted. Only the interviewers will have access to the recording, and all recorded material will be deleted when the project is over
- Estimate time length of interview (ca. 45 minutes)
- Ask if the respondent has any questions before interview starts
- OK to record?

Background (short)

- What sort of background do you have? Education, work experience etc.?
- Could you briefly tell about the projects you are currently responsible for?
- How long have you been working for the company?
- Do you have other responsibilities with regard to your team(s)/organisation?
- Could you describe your typical work day?

Agile

- What does **in short** agile mean to you?
- Which agile practices do you use?
- What are the agile practices your teams use?

Organisation

- Could you shortly describe your company/department?
- What is your position in the company?
- Self-organised teams are often considered essential for agile. To which extent does your company rely on self-organised teams?
    - What does it mean to be self-organised in your company?
    - Why does your company choose to incorporate such teams?
    - Does your company accomplish its goals by incorporating self-organised teams?

Teams

- Could you shortly describe the structure of teams you are working with?
    - How many members?
    - Permanent vs. temporary members?
- How does leadership manifest in your teams?
- What are the teams responsible for?

Self-organised teams

- To which extent can the teams you are working with be considered self-organised?
- Could you give examples of how your teams functions as self-organised?
- Can you recall instances when being self-organised led to success in your teams?
- Can you recall instances when it was a disadvantage for the teams to be self-organised?
- What are the factors that hinder your teams from being truly self-organised?

Coaching

- What is the purpose of an agile coach?
- How did you become an agile coach?
    - Course, training literature, own experience, other?
- What do you do to foster self-organised teams?
    - How do you do it?
- What are the challenges that you encounter coaching self-organised teams?
    - Individual level
    - Team level
    - Organisational level
- What helps you succeed in coaching self-organised teams?

Closing

- Is there anything you want to add that you feel we haven't covered?
- Do you have any questions for me?
- Thank you for participating. Don't hesitate to contact us at a later time if there is anything you would like us to know.

Appendix C. Approval of the data collection by NSD

NSD NORSK SENTER FOR FORSKNINGSDATA

NSD sin vurdering

Prosjekttittel

Agile coaching in IT-teams

Referansenummer

879364

Registrert

04.10.2019 av Anastasiia Tkalich - anastatk@stud.ntnu.no

Behandlingsansvarlig institusjon

Norges teknisk-naturvitenskapelige universitet NTNU / Fakultet for samfunns- og utdanningsvitenskap (SU) / Institutt for psykologi

Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)

Karin Laumann, karin.laumann@ntnu.no, tlf: 73590993

Felles behandlingsansvarlige institusjoner

Sintef / SINTEF Digital
Universitetet i Oslo / Det matematisk-naturvitenskapelige fakultet / Institutt for informatikk

Type prosjekt

Studentprosjekt, masterstudium

Kontaktinformasjon, student

Anastasiia Tkalich, nsondor@gmail.com, tlf: 48395473

Prosjektperiode

01.09.2019 - 31.12.2020

Status

08.10.2019 - Vurdert

Vurdering (1)

08.10.2019 - Vurdert

Det er vår vurdering at behandlingen av personopplysninger i prosjektet vil være i samsvar med personvernlovgivningen så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjemaet med vedlegg den 8.10.2019, samt i meldingsdialogen mellom innmelder og NSD. Behandlingen kan starte.

MELD VESENTLIGE ENDRINGER

Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til NSD ved å oppdatere meldeskjemaet. Før du melder inn en endring, oppfordrer vi deg til å lese om hvilke type endringer det er nødvendig å melde:

https://nsd.no/personvernombud/meld_prosjekt/meld_endringer.html

Du må vente på svar fra NSD før endringen gjennomføres.

TYPE OPPLYSNINGER OG VARIGHET
Prosjektet vil behandle alminnelige kategorier av personopplysninger frem til 31.12.2020.

LOVLIG GRUNNLAG
Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Vår vurdering er at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 og 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse som kan dokumenteres, og som den registrerte kan trekke tilbake. Lovlig grunnlag for behandlingen vil dermed være den registrertes samtykke, jf. personvernforordningen art. 6 nr. 1 bokstav a.

PERSONVERNPRINSIPPER
NSD vurderer at den planlagte behandlingen av personopplysninger vil følge prinsippene i personvernforordningen om:

- lovlighet, rettferdighet og åpenhet (art. 5.1 a), ved at de registrerte får tilfredsstillende informasjon om og samtykker til behandlingen
- formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål, og ikke behandles til nye, uforenlige formål
- dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
- lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet

DE REGISTRERTES RETTIGHETER
Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: åpenhet (art. 12), informasjon (art. 13), innsyn (art. 15), retting (art. 16), sletting (art. 17), begrensning (art. 18), underretning (art. 19), dataportabilitet (art. 20).

NSD vurderer at informasjonen om behandlingen som de registrerte vil motta oppfyller lovens krav til form og innhold, jf. art. 12.1 og art. 13.

Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har behandlingsansvarlig institusjon plikt til å svare innen en måned.

FØLG DIN INSTITUSJONS RETNINGSLINJER
NSD legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1. f) og sikkerhet (art. 32).

Sintef Digital og Universitetet i Oslo er felles behandlingsansvarlige institusjoner. NSD legger til grunn at behandlingen oppfyller kravene til felles behandlingsansvar, jf. personvernforordningen art. 26.

For å forsikre dere om at kravene oppfylles, må dere følge interne retningslinjer og/eller rådføre dere med behandlingsansvarlig institusjon.

OPPFØLGING AV PROSJEKTET
NSD vil følge opp ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet.

Lykke til med prosjektet!

Tlf. Personverntjenester: 55 58 21 17 (tast 1)

Appendix D. Information letter and informed consent

Er du interessert i å delta i forskningsprosjektet

"Coaching i smidige IT-team"?

Dette er en forespørsel om å delta i forskningsprosjektet som sikter på å studere hvordan coacher i Norge og utlandet jobber med smidige IT-team. I dette skrivet finner du nærmere informasjon om prosjektets formål og hva det innebærer for deg å delta.

Formål

Formålet med prosjektet er å få kunnskap om hvordan coacher jobber med smidige IT-team i ledende norske og utenlandske bedrifter.
Vi skal blant annet se på hvilke teknikker coacher benytter seg av når de utvikler team, hva er rollen av selvstyrte team i ulike bedrifter og hvilke forskjeller og likheter finnes mellom norske og utenlandske tilnærminger til agile coaching.
Prosjektet utføres i forbindelse med masteroppgave i arbeids- og organisasjonspsykologi (Norges teknisk-naturvitenskapelige universitet - NTNU).

Hvem er ansvarlig for forskningsprosjektet?
Anastasiia Tkalich (masterstudent, NTNU) og professor Karin Laumann (veileder, Institutt for psykologi, NTNU) er ansvarlige for dette prosjektet. Forskningen gjennomføres i samarbeid med Professor Viktoria Stray (Universitetet i Oslo) og Nils Brede Moe (forskningsleder ved SINTEF Digital). Samarbeidet innebærer at vi i fellesskap fastsetter formålet for prosjekt og/eller midlene som benyttes.

Hvorfor får du spørsmål om å delta?
Vi fikk vite fra deg at du fungerer som en agile coach eller din bedrift anbefalte deg som en verdifull person å snakke om agile coaching med.

Hva innebærer det for deg å delta?

Hvis du velger å delta i prosjektet, innebære dette at du blir intervjuet i ca. 45. min. Det blir tatt lydopptak og notater fra intervjuet.

Det er frivillig å delta
Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykke tilbake uten å oppgi noen grunn. Alle opplysninger om deg vil da bli anonymisert. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger
Vi vil bare bruke opplysningene om deg (f.eks. navn, e-postadresse, stillingsinformasjon) til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

- Det er kun Anastasiia Tkalich og Karin Laumann (NTNU) som vil ha tilgang til dine personopplysninger
- Alle personopplysninger vil behandles konfidensielt. Navnet og kontaktopplysningene dine vil erstattes med en kode som lagres på egen navneliste adskilt fra øvrige data
- Opplysningene vil lagres i en egen fil og vil være innelåst

- Lydopptaket gjennomføres med utstyr som tilhører behandlingsinstitusjonen (NTNU)
- Lydopptaket vil oppbevares kryptert på en minnepinne som tilhører behandlingsinstitusjonen.
- Ingen navn, e-postadresser eller andre personopplysninger vil brukes i publikasjonen forbundet med dette prosjektet

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?
Prosjektet skal etter planen avsluttes senest i desember 2020. Alle personopplysningene vil være slettet når prosjektet er avsluttet og all resterende data vil være anonymisert. Alle elektroniske opptak vil slettes.

Dine rettigheter
Så lenge du kan identifiseres i datamaterialet, har du rett til:
- innsyn i hvilke personopplysninger som er registrert om deg,
- å få rettet personopplysninger om deg,
- få slettet personopplysninger om deg,
- få utlevert en kopi av dine personopplysninger (dataportabilitet), og
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av dine personopplysninger.

Hva gir oss rett til å behandle personopplysninger om deg?
Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra Institutt for psykologi på NTNU har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvor kan jeg finne ut mer?
Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med:
- NTNU ved Anastasiia Tkalich (anastatk@ntnu.no, telefon: 483 95 473) og professor Karin Laumann (karin.laumann@ntnu.no, telefon: 735 90 993).
- Vårt personvernombud ved NTNU: Thomas Helgesen (thomas.helgesen@ntnu.no, telefon: 930 79 038)
- NSD – Norsk senter for forskningsdata AS, på epost (personverntjenester@nsd.no) eller telefon: 55 58 21 17.

Med vennlig hilsen

Karin Laumann	Anastasiia Tkalich
(Forsker/veileder)	(masterstudent)

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet *Coaching i smidige IT-team*, og har fått anledning til å stille spørsmål.

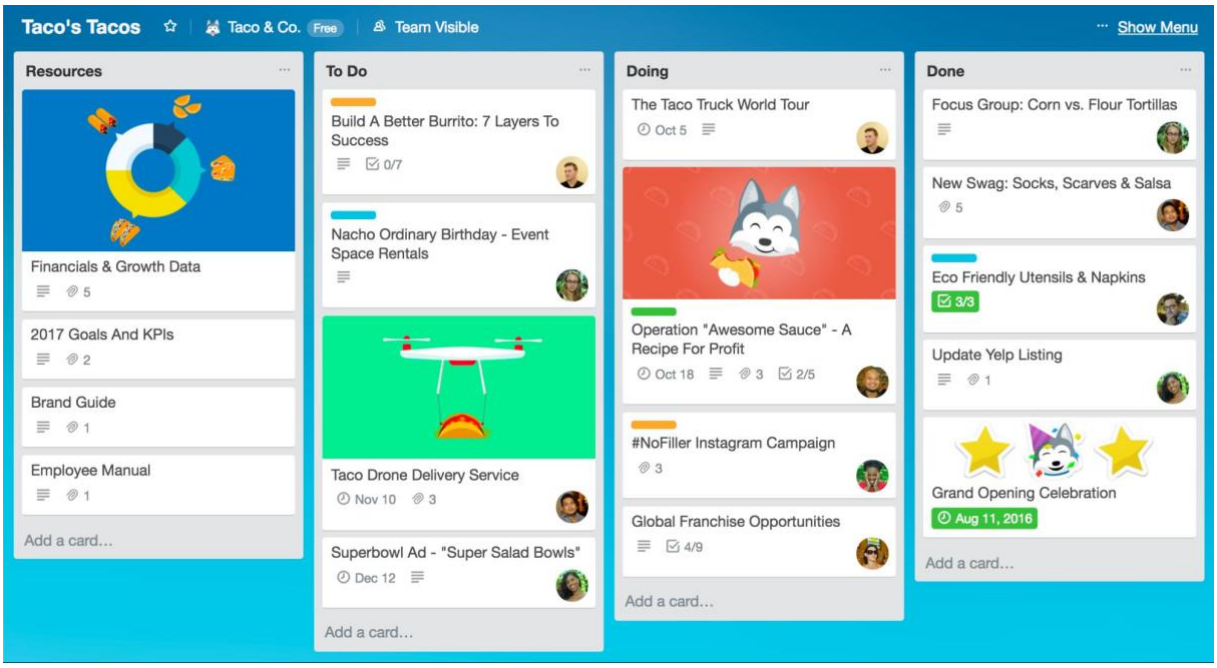
Jeg samtykker til å delta i intervju.

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet, ca. desember 2020.

(Signert av prosjektdeltaker, dato)

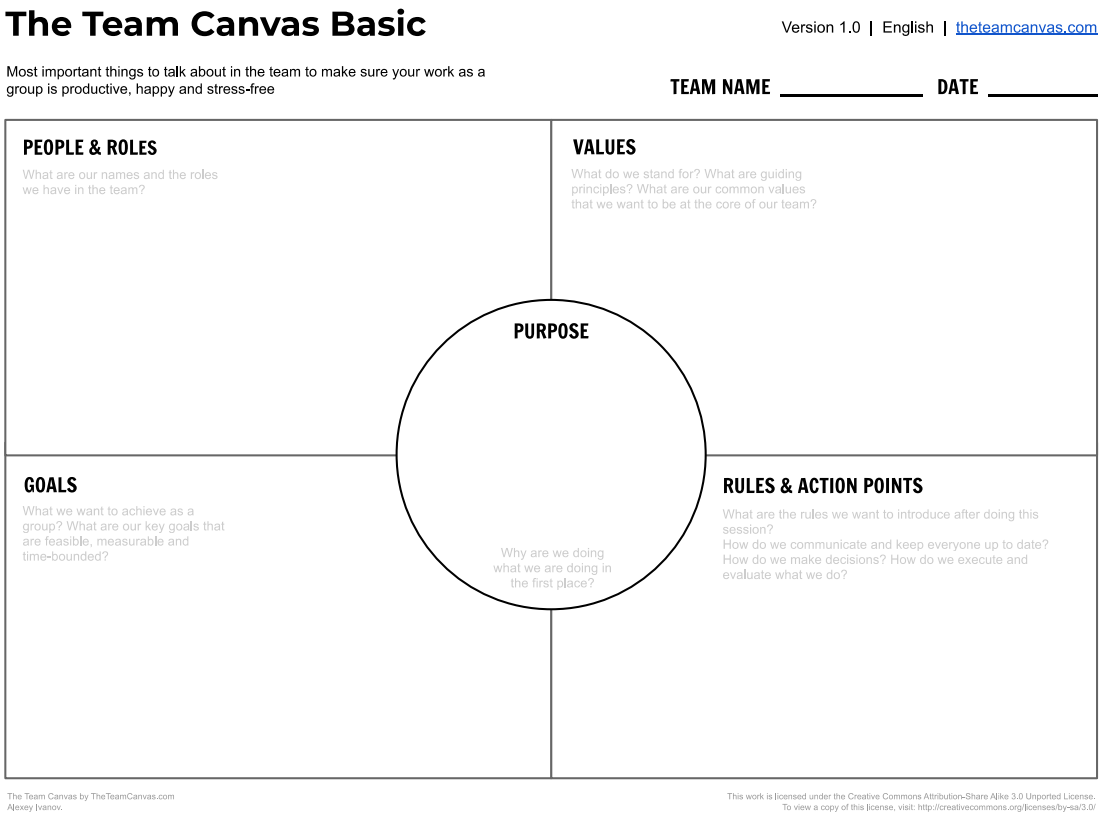
Appendix E. Example of a Trello board

Tools such as Trello board are used in order to monitor team's workload and work progress. Work tasks can be created in the column "To do" where they are also delegated to a particular team member. When the respective team member starts working with the task, she moves it to the column "Doing". When the task is completed, it is moved to the column "Done".



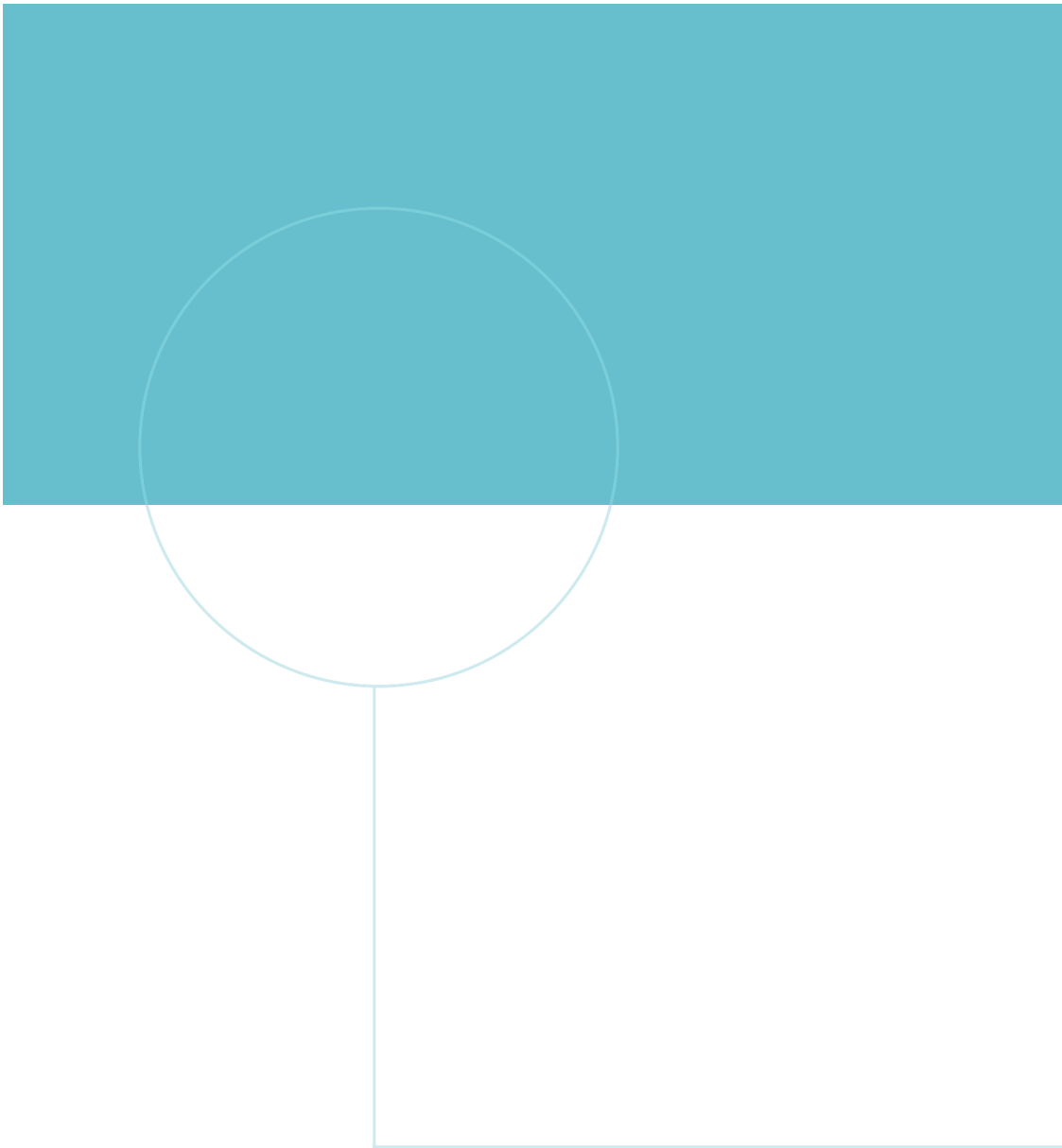
Appendix F. Template for the «Team canvas» exercise

The template I used to facilitate the team discussion on each of the four fields, which corresponds to team's roles, values, goals and rules. Team members are invited to create post--it notes and place them on the respective fields in order to discuss. Results of the discussion may be used by teams or agile coaches in the future (e.g. in case of conflicts about how to work together).



Appendix G . “Comparative agility” survey

“Comparative agility” refers to a set of tools that helps assess the level of agility in a team and organisation and compare it to other organisations (https://www.comparativeagility.com/). “Comparative agility” includes a questionnaire that serves as a data-collection tool to evaluate teams. These are some examples of items in the questionnaire (adopted from https://app.comparativeagility.com/survey/Ca):



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