JÖNKÖPING UNIVERSITY
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Scrum in Practice-
Multiple case study on three different levels

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Abstract

Scrum is an agile framework which originates in the early 90's by Ken Schwaber and Jeff Sutherland. They meant that Scrum can be implemented directly in any project and workflow. But as Scrum is implemented in different organizations, Scrum is changed, or by leaving parts of Scrum out or by combining Scrum with another agile method.

This study will address how teams in three different organizations have followed Scrum. In the case of changes in Scrum, these changes will be described as well as what cause these changes. This paper will only include IT-organizations that are currently working with Scrum, located in Jönköping.

The study is done by conducting a multiple case study as a method, with interviews as well as questionnaires as techniques to gather data. For validity and credibility reasons this study will also be using data triangulation. The interviews will be on three different levels; Manager, Scrum Master and Development Team Member. In total there will be 22 interviews.

The authors found that a pure Scrum method is rarely implemented in the teams. The major factors for not following a pure Scrum was that the teams either lacked personnel, knowledge or experience in Scrum or Scrum combined with Kanban and LeSS. According to our results Scrum cannot be applied directly in any given projects, but rather needs to be adjusted to fit the company's projects.

Keywords: Scrum, Agile methods, Adjustment, Common factors, Scrum-team, Scrum Master, Development Team Member, Product Owner

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1. Introduction

This chapter presents an introduction to the topic and problem statement, purpose, scope and outline of further chapters.

In 2001, 17 people met to discuss a new way of developing software. They had reacted to unsuccessful IT development projects that were bound to unrealistic project plans. Plans that suffered from heavy documentation and a too detailed requirement specifications as well as contract writing instead of working communication between customer and supplier. From these 17 people, "The Agile Manifesto" emerged. This changed how the industry works. (Agilemanifesto.org, 2001). The manifesto contains four values and twelve principles reflecting the agile way of thinking. The four values state the following:

- **Individuals and interactions** over processes and tools.
- **Working software** over comprehensive documentation.
- **Customer collaboration** over contract negotiation.
- **Responding to change** over following a plan.

The Agile Manifesto shows which values are worth-while within the agile system development. Even though all values are considered, the bold values on the left are fulfilled first. All these values are what reflect the agile mindset (Agilemanifesto.org, 2001).

One of the development methods which uses the agile way of thinking is *Scrum* (Schwaber & Sutherland, 2017). Scrum was created by Ken Schwaber and Jeff Sutherland in the early 90s. The word Scrum comes from the sport of Rugby, where it is a method for the player to set the ball into play by forming their heads tightly together. This method is a metaphor for how the Developers of a Scrum-team work together. Scrum is described as an agile framework which uses the agile way of thinking. Scrum handles an iteration process that involves client collaboration to ensure the client's needs.

Schwaber and Sutherland (2017) explains that Scrum consist of three roles, five events and three different artifacts. The Product Owner, the Development Team Members and the Scrum Master forms the three roles, and each of them have their own responsibilities. The Product Owner is responsible for optimizing the value of the product. The Development Team Members develop the product. The Scrum Master's responsibilities are to make sure that the team members understand Scrum theory, rules, values and practices. Together, the team will conduct several *Sprints*. During the Sprint approach, the team will conduct five different types of Scrum events, namely; *Daily Standup*, *Backlog Grooming*, *Sprint Planning*, *Sprint Review* and *Sprint Retrospective*. With all these events, the *Product Backlog*, *Sprint Backlog* and the *Product Increment* are created, which are also called the *Scrum Artifacts*. Both the Product Backlog and the Sprint Backlog describes the work to be done whilst the Product Increment speaks for the done part of a product during a Sprint (Scrumalliance, 2017). The Scrum artifacts are transparent, in which both the team and the client can inspect and adapt. Together, all these elements form the agile method Scrum. The elements will be described more fully in chapter 3 *Theoretical Background*.

Due to the flexibility of the agile methods, companies often customize the methods to fit their specific projects (Tripp & Armstrong, 2018). Different characteristics and environmental context of the projects will most likely require the methods to be customized. The agile methods are often

combined, where Extreme Programming (XP) and Scrum being a common combination. D. A. Mishra (2011) explains that the methods complement each other well were both have different responsibilities. In one example, Scrum is addressed to the actions taken while XP shall ensure the quality of the software. The example included the usage of XP's one- or two-weeks iterations to get customer feedback frequently, instead of Scrum's 30-day iteration (D. A. Mishra, 2011). A lot of researchers and practitioners have tried to evolve Scrum to address the challenges of adopting Scrum. Most of the researchers have tried to optimize the method to more of a realistic adoption of reality (Ashraf & Aftab, 2017). But issues with implementing Scrum into organizations are still commonly seen (Campanelli & Parreiras, 2015)

1.1 Problem statement

VersionOnes thirteenth State of Agile survey 2019, the world's biggest agile survey, reports that 97% of the respondents are practicing the agile method in their organization (VersionOne, 2019). The same survey also showed that 54% are practicing Scrum and 32% are practicing Hybrids of Scrum, these are the most common agile methodologies used in the industries. The result from the survey could mean that Scrum exists in many combinations. The combinations of Scrum could vary due to the company's projects, meaning Scrum is very flexible. Cho (2009) explains that Hybrid of Scum is a combination of Scrum with other agile methods.

Campanelli and Parreiras (2015) point out the benefits of the agile methods such as increased quality, productivity and enhanced flexibility, but the challenge is to implement agile within the organization. Campanelli and Parreiras also say that the whole organization needs to embrace the agile way of thinking, including the management level. One of the main reasons for Scrum failing is the lack of knowledge or experience of Scrum (Papatheocharous & Andreou, 2014). Papatheocharous and Andreou (2014) showed this in a major study on agile methods worldwide and found that tailor-made and company-specific agile methods, in addition to Scrum was occurring. Kuhrmann et al. (2017) found that a combination of agile methods, which is known as hybrid-approaches, was the most common.
The method that occurs frequently when talking about adjustment of agile methods is a tailored version of Scrum, meaning parts of Scrum being left out or adjusted (Scrumalliance, 2017). Scrumalliance describes that the reason for this being is that it can be applied to all types of projects and products. The method is often not conducted as Scrum is defined, but rather adjusted to the company's needs (Eloranta, Koskimies & Mikkonen, 2015).

Before the Agile manifesto was created, a book written by Brown, Malveau, McCormick and Mowbray (1998) describes the most common problems when developing software. They recognize these as Antipatterns, where they believe that it is an effective way to communicate software knowledge. In later days Eloranta et al. (2015) released a report on the most common Scrum anti-patterns. One them is often referred as "ScrumBut". This means that different parts of Scrum are modified. A paragraph in Scrum.org (2009) describes "We use Scrum, but retrospectives are a waste of time so, we do not use them" (Scrum.org, 2009).
These Scrum anti-patterns, also associated with deviations could lead to important parts of Scrum being left out (Eloranta et al., 2015). As stated earlier in this section, Scrum is a method which easily can be adapted to different projects. Therefore, companies oftentimes have their own variation of Scrum.

1.2 Objective

As stated in *1.1 Problem statement*, the most common agile method is Scrum or Hybrid of Scrum. Scrum is described as a flexible method which gives the companies and the teams within the companies the opportunity to adapt Scrum to their needs. The adjustment of Scrum could result in companies leaving out important parts of Scrum. According to Schwaber and Sutherland (2017), Scrum must contain all parts defined for it to be called just Scrum. Otherwise it is not Scrum, and hence, various interpretations of the method. Therefore, different companies can have their own Scrum Standard for their teams to follow. With this said, the aim of this research is:

To contribute to a deeper understanding about how Scrum-teams are working with the method within their companies.

The research will be conducted on three different companies. To find out if the companies define Scrum as Schwaber and Sutherlands say or if the companies have their own definition of Scrum, the following research question has been formulated as:

RQ1. How do companies follow defined Scrum?

Furthermore, it will be of interest to see if the Scrum-teams within the company are following the companies Scrum Standard, as it is the Scrum-team that practices Scrum. For this reason, the second research question is stated as following:

RQ2. To what extent does the Scrum- teams follow the companies' Scrum Standard?

This will be done by interviewing members of Scrum-teams; Scrum Masters and Development Teams Member.

To get a deeper understanding of why Scrum in some cases need to be tailored, the research will include common factors that might be the cause of the adjustments of Schwaber and Sutherland (2017) definition of Scrum, with the following research question:

RQ3. What common factors lead to the adjustment in Scrum-teams?

Ultimately, this study moves away from studying Scrum on company level. Instead this study will be focusing on the Scrum-teams on three different levels, which is this study's uniqueness.

1.3 Scope

This research will only include IT-businesses and parties that actively work with the agile method Scrum. This research will investigate ten different Scrum-teams and a Manager at each company, in Jönköping. In total there are 22 interviews divided into three companies. The focus will not be on Hybrids of Scrum, ScrumBut or other agile methods but there are still going to be mentioned because they are commonly seen. The authors will assume that all parties are telling the truth and speaks on behalf of respective teams.

When discussing Scrum in this study, the authors will refer to Schwaber and Sutherland (2017) as the defined Scrum. How Scrum is defined is presented in chapter *3 Theoretical Background.*

1.4 Thesis outline

- **Chapter 2 – Method and Implementation**
  Method and Implementation chapter explains the different approaches used to collect data for the study.

- **Chapter 3 – Theoretical background**
  This chapter describes the agile method Scrum and its parts.

- **Chapter 4 – Results**
  Result of the collected data will be presented here.

- **Chapter 5 – Analysis**
  The gathered data will be analyzed in this chapter.

- **Chapter 6 – Discussion and Conclusion**
  This chapter presents the conclusion of the study and as well discussion about the presented data. Further research will also be covered.

2. Method implementations

The chapter provides an overview of the study's process. Furthermore, the study's approach and design are described. In addition, the study's data collection and data analysis are described. The chapter concludes with a discussion about the study's credibility.

2.1 Research Design

A multiple case study is the choice of research design in this study. When using a multiple case study, the collected data required can be gathered in many ways, making a multiple case study suitable for answering the study's objective (Blomkvist & Hallin, 2017). Blomkvist and Hallin continues to describe that the multiple case study could focus on several individual cases, to get a profound knowledge of the bigger picture. The bigger picture is reflected by reality, resulting in an easier comparison between Scrum in practice and in theory. The method will approach a systematic way of working, meaning transparency of how the multiple case study has been conducted as well as the choices of the techniques used in this paper (Blomkvist & Hallin, 2017).

A multiple case study will generate detailed empirics, compared to when experiments or a questionnaire, is the sole source of collecting data. A multiple case study comes handy when to increase knowledge of the studies area (Blomkvist & Hallin, 2017). The research aims to increase the knowledge as well as understanding of different aspects of the studied area. The studied area will later be compared to see what differentiates from one and other (Blomkvist & Hallin, 2017).

Höst & Runeson (2008), mentions that research in software engineering mentions that software engineering research usually involves researching and finding new discoveries. How different parties, like software engineers and stakeholders for example, work under different conditions. These parties have important roles in development. Without them, there would not be anyone who owned the product or developed the product (Höst & Runeson, 2008). This paper will only address key roles in development to understand their work under different condition. This includes different companies within development as well.

A multiple case study is a series of experiments that can be considered as replications, contrast and even extensions for the emerging of a result (Eisenhardt & Graebner, 2007). Eisenhardt and Graebner (2007) continues to explain that case studies are one of the best approaches to compare practice and theory. This suits the research, because this is how chapter *5 Analysis* will we conducted, comparing the practical and the theoretical.

Stake (1995) states that when studying several individual cases, it is possible that the same generalization can be drawn. With further observations, numerous cases can deviate from that generalization. This does not mean that the generalization is invalid but can be redefined. In other words, it is not a new generalization, but rather it is a modified generalization. Along the way of this study, many generalizations can be drawn, but they are so called "petite generalizations" and has their meaning in occurring often. Particularly for this study, the "grand generalization" is of interest, the bigger picture (Stake, 1995).

In later researches, Stake (2006) mentions that a multiple case study is resourceful due to the fact that a multiple case study is a collection of cases. The collection of cases shares a common objective. Stake (2006) uses the quintain as a metaphor. When dueling in a quintain-battle, one wants to hit the opponent to win the battle. To hit the opponent, it is all about the aim, if you do not aim, you will miss and lose the battle. In terms of multiple case study, it is about being able to

see the context of the cases, and how the context can be recognized in all the studied cases. Stake (2006) means that the aim in all cases should reflect to the same objective (Stake, 2006). This is what will be done during the interviews for the research, aiming to reflect the same objective.

2.2 Techniques

To collect data, semi-structured interviews and questionnaires will be conducted. This will generate a thorough overview regarding the area of Scrum in different organizations. The questionnaires are done first to reinforce the reliability and credibility of the interviews. The collected data will be based on ten different Scrum-teams. A literature study will assist in identifying further references, in which can be used for additional literature study and article findings. These sources of information can later help to identify authors as well as group of researchers whereupon further material can be found (Blomkvist & Hallin, 2017). To get a deeper understanding of the deviations regarding Scrum, problems within implementation of Scrum will also be studied.

Blomkvist & Hallin (2017) states that semi-structured interviews as a technique can generate a wide range of data and new discoveries. But also, when wanting to gather a profound knowledge of a studied area as well as discovering new dimensions to get extensive answers from the participants. The interviews will be semi-structured, meaning each level shall be asked different questions, but everyone on the same level shall receive same questions. The supplementary questions on the other hand may vary based on what the interviewee answers, in which will lead to more discussion (Patel & Davidson, 2011).

Denscombe (2016) describes that by completing a semi-structured interview, the answers may be more profound as they are detailed, compared to other types of interviews, thus the choice of technique. The interviews will be face to face. By having face to face interviews, it can prevent possible misunderstandings between the interviewer and the interviewee (Denscombe, 2016). Moreover, the interviews will be around 30 minutes and be recorded with the interviewee's consent, whilst being confidential. Aside from the interviews being recorded, note taking will be happening simultaneously.

2.3 Approach

Qualitative methods will answer questions like "why" and "how", while quantitative methods will answer questions in "how many" and "in what proportion" for example. The qualitative methods are rather open-ended questions, leaving the interviewer with a wide range of information (Blomkvist & Hallin 2017).

Silverman (2010) explains that a quantitative research lacks the ability of including scientific terms such as causes and effects. This means that conducting a purely quantitative study within this paper will result in vague answers. This study has its meaning in not only receiving an answer, but understanding the studied cases, hence the choice of qualitative method (Silverman, 2010).

2.4 Working procedure

According to Runeson and Höst (2008) there are five different steps that needs to be fulfilled when conducting a multiple case study. These five steps also introduce how the authors proceed with the working procedure. The first step in the process is called "Case study design", meaning the objective needs to be defined as well as a plan of the study. The plan consists of the conducted methods and techniques when collecting data, which is included in the study along with previous studies in the same area to define the research questions.

The second step is the "Preparation for data collection". This means the planning of the interviews and questionnaires. The questionnaires were formed first, in which the focus was on gathering metadata from the participants. As the questionnaires were formed, the interview questions were defined. The interviews' purpose was to get as much information as possible.

The third step is called "Collecting Evidence". In this step the questionnaires were sent out through email to each participant. Then the interviews took place to collect data. The interviews were face to face and the data was collected in real time (Lethbridge, Sim & Singer, 2005).

The fourth step is the "Analysis of collected data", which means that the interviews and questionnaires were analyzed. This can be read about in the section 2.6 *Data analysis*.

The last step is "Reporting", were all the findings are written down and based on the findings, conclusions are drawn. The *figure 1* represents the working procedure of this research.
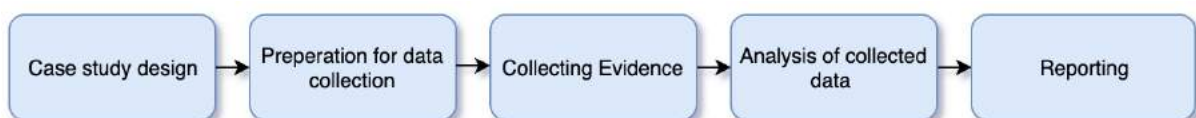
Figure 1. Authors own figure of the working procedure.

The small black dots in the *figure 2* below represents the interviews conducted in each company. All the rings around the dots represents one case in each company. This will be regarded in chapter *4 Results.* In chapter *5 Analysis,* the companies will then be treated as individual cases instead, meaning this study will reflect three cases, Company X, Y and Z. The reason for Company Z having two dots in the same circle and one Product Owner is explained in chapter *4 Results.*
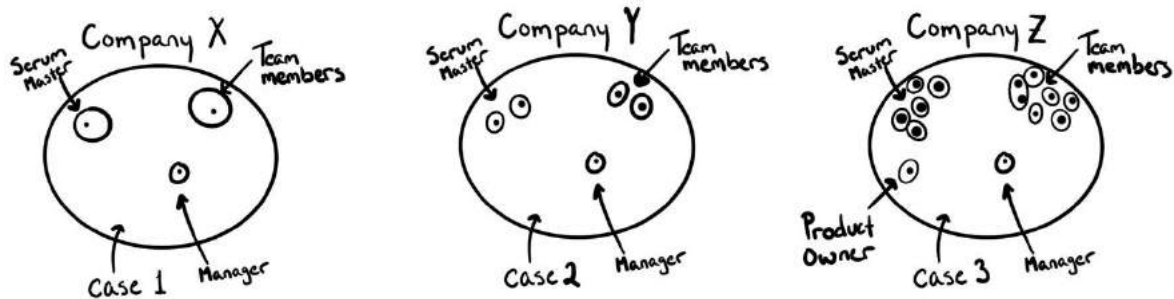
Figure 2. Authors own figure of the Multiple cases.

2.5 Selection

The interviews and questionnaires will be conducted on three different levels, meaning the Manager from each company, one Scrum Master and one member of the Development from each team. Benbasat, Goldstein and Mead (1987) describes that it is important to collect data from different selected aspects for analyzing in a comparative study. However, in practice these selections can be limited due to the availability.

When choosing which companies that the authors would study, five companies were contacted, but only three of them answered. The choice of these five companies was due to the fact that the authors knew that they were working with Scrum, but not to what extent. How the authors knew this cannot be revealed for the risk of breaking the confidentiality.

In choosing which candidate that would participate in the interviews, they were selected by the coordinators or the Managers of the companies. When contacting them it was clearly mentioned that the chosen interviewees had to be actively working with Scrum. Any candidate who had previous experience, but not currently working with Scrum was not of interest. It is important for this paper's validity that the participants are up to date with the company's implementations, hence the deselection.

2.6 Data analysis

The analytic procedure will be conducted with a qualitative data analysis. Yin (2014) explains that the purpose of an analysis is to draw conclusions from the data to get a clear chain of evidence. In short, the reader should be able to follow the results and conclusion from the collected data, meaning every studied step and every decision must be presented (Yin, 2014).

As Runeson and Höst (2008) says, it is beneficial for the paper if multiple researchers conduct the analysis to reduce the bias by individual researchers. Therefore, when conducting the data analysis, a discussion between the authors will be made before presenting each conclusion. If the authors cannot agree in a joint conclusion, each conclusion will be considered as a preliminary and then be merged into a common conclusion (Runeson & Höst, 2008).

2.7 Credibility of the data collected

Qualitative research is often judged after its credibility. Therefore, it is important that the data gathering is accurate and reproducible (Patel & Davidson, 2011). When doing the interviews, it is important that the participant understand the questions asked. In order to prevent the answers from being misinterpreted, a supplementary question will be asked to confirm the answer. Questions that will be asked on the interviews will be extensive, to ensure extensive answers. The credibility is also confirmed by the questionnaires that are being sent out in beforehand, where the participants will answer questions about their educational background and experience in Scrum. This gives a clear picture about the participants when interviewing them. But this comes at a cost, alerting the people considered for selection about the general topic that is investigated. This means that the people considered can prepare fixed answers.

Choice of method is argued in previous sections and are considered to be a relevant method for this type of study. It will also be of importance to note that there are two types of reality. When interviewing the participants, they will describe their reality at the company, which could look different from how it really is. However, to get a grasp of the real reality, this paper will use triangulation.

Stake (1995) mentions the importance in triangulation. Triangulation will help the study to increase the precision of the empirics. It means that the same object is studied, but from different angles which can give a deeper understanding of a phenomenon. Stake (1995) says there are four different types of triangulation, but in this paper, one of them will be used.
The triangulation used in this paper is data triangulation, which is conducted when using more than one data source (Stake, 1995). Particularly, in this paper the data source is used in three different aspects; team, company and techniques. This is to validate the empirics.
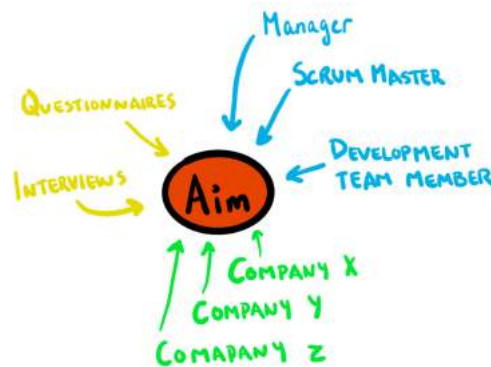
Figure 3. Authors own figure of the data triangulation.

3. Theoretical background

In this chapter an overview of Scrum in theory will be described. This theoretical overview is the basis for the analytics of the gathered data.

3.1 Overview of Scrum

Scrum is used for developing, delivering and sustaining complex products. The definition of Scrum is:

A framework within which people can address complex adaptive problems, while productively and creatively delivering products of the highest possible value.

(Schwaber & Sutherland, 2017, p. 3)

Schwaber and Sutherland (2017) continues to describe that Scrum is not a process, technique or definitive method. Instead they describe it as a framework to employ different techniques and processes. According to Schwaber and Beedle (2001), it is the Scrum-teams that selects the choice of method and how the product should be developed.

Scrum make use of an iterative and incremental approach to make sure to optimize predictability and control the risks. In Scrum this is called Sprints and can be seen as milestones where some parts of the product will be delivered (Schwaber & Sutherland, 2017). The *figure 3* below shows a graphical overview of how a Sprint is conducted. Before a Sprint, the Scrum-teams gathers input from the end-users, customers or other stakeholders which then is put into the Product Backlog. Then, a meeting is held, a so-called Sprint Planning meeting where it is determined how much the Scrum-teams will commit during the Sprint. These commits are broken down into tasks and put into the Sprint Backlog. This is the start of a Sprint. Daily Scrum (Daily Standups) is held every day during the Sprint and Product Backlog Refinement (Backlog Grooming) is held to polish the Product Backlog. At the end of Sprint, a Sprint Review is held for the customers to show the product. After the Sprint Review, the Scrum-teams will conduct a Sprint Retrospective. In this event, the Scrum-teams discusses how the Sprint went and what could be better.
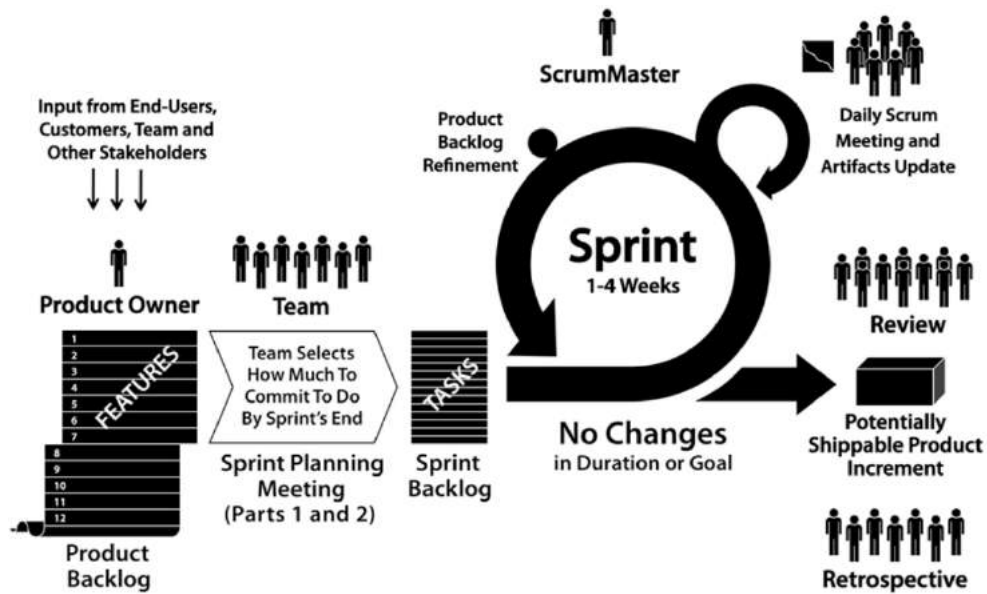
Figure 4.The Sprint process (Deemer, Benefield, Larman & Vodde, 2010).

3.2 The Scrum Team and Scrum Roles

In a Scrum-team there are three roles, the Development team, the Product Owner and the Scrum Master, each role carries its own responsibility. A Scrum-team should have the competence of being multi-functional. This means that the team should have the knowledge of working in any assigned role. The purpose of this team design is to optimize flexibility, creativity and productivity (Schwaber & Sutherland, 2017).

3.2.1 Development team

As Schwaber and Sutherland (2017) explains there exist no titles within the Development team. The Development Team Members consist of Developers with different areas of expertise.

Depending on the project, not all responsibilities need to be fulfilled, whilst someone can be assigned more than one responsibility. The Development Team Members has the support from their organization to manage their own work, meaning that they decide upon how to work on the Sprint Backlog. It is important for the Development Team Members to be multi-functional, to create a Product Increment.

Scrum does not categorize a person by responsibility. An individual may have specialized skills, but the work done by an individual is accounted by the Development team as a whole (Schwaber & Sutherland, 2017).

3.2.2 Product Owner

This role has its focus on maximizing the value of a product made from the Development team. As the name suggests, this role owns the developed product. How the Product Owner manages the maximization of a product varies, it has no sets of rules of how this is done (Schwaber & Sutherland, 2017).

Schwaber & Sutherland (2017) explain the Product Owner not only own the finished product but also the Product Backlog. This means that this role also is the owner of the finished part of a product. The Product Owner is in charge of ordering items needed for the Development team, to the Product Backlog as well. The Product Owner has to know the importance in always having the Product Backlog visible, transparent, as well as understanding it, to show what tasks to deal with next.

What is stated above is either done by the Product Owner or the Development team, in any case, it is the Product Owner that holds accounted for. If the Development team needs to make changes in the Product Backlog, the Product Owner has to be addressed (Schwaber & Sutherland, 2017).

3.2.3 Scrum Master

The Scrum Master acts as a sounding board, helping everyone in the Scrum- team to understand Scrum theory, practices, rules and values (Schwaber & Sutherland, 2017). This role is a type of leadership, but a leadership not associated with authority, but leadership through influence. It is the Scrum Master that facilitates the Daily Standup, ensuring that all the decisions are promptly made. But as the Scrum-team becomes more self-managing and understand Scrum, the Scrum Master steps back and assists the Scrum-team when encountering impediments.

If a Scrum-team encounter too many impediments, then this role may need to be filled by a Senior Manager or a Scrum consultant. An impediment can be caused by many different factors, but it is always this position's responsibility to carry them out. It is important that a Scrum Master is determined to do whatever necessary to remove the impediments, it is the impediments that impacts the productivity of a Scrum-team. But it is important to keep in mind that the Scrum Master should not combine his role with another role, for conflicts may emerge as well as confusion. The Scrum-team should only know the Scrum Master as a Scrum Master. (Schwaber & Beedle, 2001).

3.3 Scrum Events

Scrum events can be understood as meetings. These events are:
- Sprint Planning
- Daily Standup
- Backlog Grooming
- Sprint Review
- Sprint Retrospective

These Scrum events gather the team on a regular basis, to update the team and to minimize meetings that are not defined in Scrum. These Scrum events have a maximum duration, and can only be shortened or lengthened, but the event can be shortened in the case of the event reaching its purpose. This duration is based on the idea of not wasting any time in the process of a sprint.

3.3.1 Sprint Planning

This Scrum event is held before the start of a Sprint. In this event, the work to be performed is planned by the entire Scrum-team. Each Sprint is usually not longer than one month. Schwaber and Sutherland (2017) says that the event should answer these two questions:

- What can be delivered in the Increment resulting from the upcoming Sprint?
- How will the work needed to deliver the Increment be achieved?

The Product Owner discuss the objective of the Sprint with other team members as well as sorting the Product Backlog items with highest priority. Based on experience in previous Sprints the work to be done is estimated from the team's capacity (Schwaber & Sutherland, 2017). When the Product Backlog items have been selected, a Sprint Goal is created. The Sprint Goal defines the objective that should be met through the implementation of the Product Backlog. The reason for having a Sprint Goal is to provide guidance to the Development team members of why they are building the increment (Schwaber & Beedle, 2001).

3.3.2 Daily Standup

The Daily Standup is where the Development team meets daily for a 15-minute meeting (Schwaber & Beedle, 2001). Each team member attends the meeting and plans for the next 24 hours. Schwaber and Sutherland (2017) point out that it is important for the meeting to be held at the same place and time to reduce the complexity. The Scrum Master is responsible for making sure that the Daily Standup is held but it is the Development team that is responsible for conducting it (Schwaber & Sutherland, 2017). During the meeting each team member answers three questions:

- What have you done since the last Daily Standup?
- What will you do between now and the next Daily Standup?
- What got in your way of doing your work?

Each answer is very concise and should not deviate from the subject (Schwaber & Beedle, 2001). If further discussions are required regarding impediments, this should be discussed after the meeting. These questions are for the team to inspect the progress of the Sprint Goal and to get a clear picture of how the trend towards completing the Product Backlog looks like (Schwaber & Sutherland, 2017).

Daily Standups improve communications, eliminate other meetings, identify impediments to development for removal, highlight and promote quick decision-making, and improve the Development Team's level of knowledge. This is a key inspect and adapt meeting.

(Schwaber & Sutherland, 2017, p.12)

3.3.3 Backlog Grooming

Backlog Grooming is not yet an official event in the Scrum guide (Schwaber & Sutherland, 2017) but for many Scrum practitioners it is seen as one. This event can also be called Product Backlog Refinement. During this event the Product Backlog is reviewed and revised (Schwaber & Sutherland, 2017). It is the Scrum-team that decides when the refinement is done and how it is done. But it is the Product Owner's responsibility to make sure that the Product Backlog is in fine shape (Pichler, 2010). It is the Scrum-teams that decides when to implement this event for the Sprint. Some teams prefer to do it after the Daily Standups other prefers to do it in longer sessions

towards the end of the Sprint. Pichler (2010) describes that a well-kept Product Backlog is a prerequisite for a successful Sprint Planning meeting.

3.3.4 Sprint Review

The purpose of the Sprint Review is to present what has been achieved during the Sprint (Schwaber & Beedle, 2001). This is done once per Sprint. The attendees in the meeting are often the Scrum-team, key stakeholders and Product Owner. As well as presenting the completed work, the Development Team Members discuss the Sprint. The discussion is based on what went well, the problems that they ran into and how those problems were solved (Schwaber & Sutherland, 2017). The Product Owner also includes discussion about the current state of the Product Backlog. In the end of the meeting, the entire group collaborates and discuss what to do next (Schwaber & Beedle, 2001).

3.3.5 Sprint Retrospective

A Sprint Retrospective is held after the Sprint Review. This Scrum event is for the Scrum-team to inspect themselves and to create a plan for further improvements onto the next Sprint (Schwaber & Sutherland, 2017). The Scrum Master usually shows the Sprint Backlog with the team and summarize the Sprint. Each person gets the chance to talk without being interrupted and discusses what went well and badly and what could be better next Sprint (Schwaber & Beedle, 2001).

3.4 Scrum Artifacts

The Scrum Artifacts represents the value or work of a product, this provides transparency for the Scrum-team. When Scrum artifacts are transparent, the team knows what tasks that needs to be done. The Scrum artifacts also give the chance for the customer to know what has been done, and what is the expected work. It is designed to maximizing the transparency which gives everybody the same understanding of the Scrum artifacts (Schwaber & Sutherland, 2017).

3.4.1 Product Backlog

Scrumalliance (2017) mentions that the Product Backlog is a list of everything that is known for the team to be done in a product. It is constantly growing during the project. Based on the Product Backlog, the team knows what the most important tasks are, and knows what tasks to complete next. The Product Backlog is transparent, so that everyone in the team knows what to work on. It also shows the priorities and what is left to develop for the customer (Schwaber & Sutherland, 2017).

The Product Backlog is owned by the Product Owner as mention in an earlier section. It is the Product Owner that decides what goes on the list and what order the things on list should be done. The reason is that the Product Owner is the one that meets the customer and knows the customer's desire (Scrumalliance, 2017).

Each item on the list has a description of what needs to be done, an estimated time for completing a task and a value. The Product Backlog is constantly growing and might change based on the feedback from customer. Even though several Scrum-teams are working with the same project, they all share the same Product Backlog. The changing and updating of the Product Backlog occurs during the Backlog Grooming (Scrumalliance, 2017).

3.4.2 Product Increment

The Product Increment is a new and updated version of the product. This Scrum artifact is achieved after each Sprint. The reason for it to be new and updated is for the Product Owner to decide if one wants to release it immediately. But the Increment is only considered done if no additional work is needed for it to be finished (Schwaber & Sutherland, 2017). Each Increment is additive from previous increments and are carefully tested to ensure that all the Increments works all together. For the Scrum-team to know when a task is done, they all share the same understanding of what quality a task needs to have in order for it to be considered done. This shared understanding is also implemented in the Product Increment. Each definition may vary across different Scrum-teams, based on the team's context and goals. When multiple Scrum-teams work with a project, they share the same understanding of minimum quality for a task to be done which is adhered by all the teams (Scrumalliance, 2017).

3.4.3 Sprint Backlog

The Sprint Backlog has the same purpose as the Product Backlog, but the difference is the Sprint Backlog are items that will be completed during a Sprint. It also includes a plan for delivering the Product Increment as well as realizing the Sprint Goal. This list helps the team to understand what functionality is needed in the next Increment, which also provides the information of what work that is needed to deliver a done functionality (Schwaber & Sutherland, 2017).

The transparency provided by the Sprint Backlog identifies what tasks are required to be done in order to meet the Sprint Goal (Schwaber & Beedle, 2001). To always ensure improvement during each Sprint, the Sprint Backlog includes at least one task with high priority, which is decided upon in the Sprint Retrospective. This means that at least one of the items on the list will be done after each sprint due to its priority. The Sprint Backlog includes enough detail, that if changes need to be done in a Sprint, the information about this in a Daily standup regarding the change is enough for the team to make it happen (Schwaber & Beedle, 2001).

When new work arises, the Development Team Members puts it in the Sprint Backlog. It is also the Development Team Members that updates the estimated time of the remaining tasks, when an item in the list is done. This list belongs solely to the Development Team Members and can only be changed by them. The Sprint Backlog last as long as the Sprint.

3.5 Anti-patterns

The book *AntiPatterns. Refactoring Software, Architectures, and Projects in Crisis* by Brown et al (1998) describes what goes wrong in software development. This book identified the most common Scrum anti-patterns that occurs when developing software. Brown et al believes Scrum anti-patterns are an effective way to communicate software knowledge. Scrum anti-patterns are harmful in its nature and are common practices which seems convenient in initializations but are harmful for the project in the long run, hence be avoided. Scrum anti-patterns can often be associated with an alternative way of working, which is a recommended practice and is more appropriate in most cases. Scrum anti-patterns are presented to mediate harmful practice, this is for easier recognition to understand and avoid them.

When some parts of Scrum are being left out it is called ScrumBut (Scrum.org, 2009). Scrum.org exemplifies: "We do not do Daily Standups because…", this could lead to negative result when using Scrum. Eloranta et al. (2015) describes these as Scrum anti-patterns. Eloranta et al. (2015)

conducted a survey which identified the most common Scrum anti-patterns in eleven different companies. They found 14 Scrum anti-patterns which could be harmful for the companies. For example, *Customer Product Owner*, which led to that the Product Owner tries to dictate how the Scrum-team should implement feature and, in this way, disrupt the Scrum-teams work. *Unordered Product Backlog* led to the Scrum-team might not see the potential risks or valuable elements of the products. Table 1 is a list of the 14 Scrum anti-patterns.

Identified Scrum anti-patterns	Consequences
Too long Sprint	Tasks tend to be unfinished at the end of a Sprint, possibly because the first weeks are not used efficiently enough.
Testing in the next Sprint	When testing takes place in the next Sprint, new code may be written on top of non-tested code.
Big requirements document	Requirements of the system as a whole are not well understood by the team, as they are hard to find from a big documents.
Customer Product Owner	The customer might be too busy to prepare enabling Product Backlog Items for the Team.
Product Owner without authority	The Product Owner does not have the authority to decide on which items are implemented and which are discarded.
Unordered Product Backlog	As Product Backlog is unordered, the Team might be lacking vision of the risky or valuable elements of the product
Work estimates given to teams	The anti-pattern results in Teams that lack commitment: if there is slack time in Sprint, Teams do not pull features from the Product Backlog into the Sprint.
Invisible progress	Invisible progress results in lacking progress awareness of the Team.
Customer caused disruption	Customer caused disruption interrupts the work flow of the Team, consequently reducing the efficiency of the Team.
Semi-functional teams	The anti-pattern results in divided responsibility of producing a shippable product and less committed Team
Varying Sprint length	As there is no time boxing, visibility of the made progress gets blurrier and the possible problems in the development do not surface
Business as usual (No Sprint Retrospective)	As the Team is continuing business as usual, there is no continuous improvement and no changes in the productivity and efficiency of the Team
Long or non-existent feedback loops	Changes to the product at a late stage of development are likely to take place as feedback is only received when the customer starts to use the product
Hours in progress monitoring	As a consequence of using hours in progress monitoring, estimates can become inaccurate and they are often exceeded.

Table 1. Scrum Antipatterns

3.6 Hybrids of Scrum

Hybrid of Scrum means that Scrum is combined with another agile method. According to VersionOnes (2019), two of the most combined methods with Scrum are XP or Kanban. Nikitina, Kajko-Mattsson and Stråle (2012) describes the reason for combining Scrum and Kanban (Scrumban), is that both the methods are described as lightweight agile methods. The methods are also based on teamwork and the importance of the Development Teams Members being self-organizing. Since both the methods are lightweight agile methods, one can take parts of Scrum and combine it with Kanban principles (Nikitina et al, 2012). Sjøberg, Johnsen & Solberg (2012) describes that Scrum is limited, hence the combination with other methods. In their study the companies described Scrum as being to rigidly and did not fit their company's context. Therefore, the company decided to combine Scrum with Kanban. By conducting Scrumban, it was easier for the company to solve the sudden problems that arose, instead of delaying the Sprints. With Scrumban, the Developers could focus on a smaller number of tasks, which led to better quality (Sjøberg et al, 2012).

Cho (2009) presented another hybrid approach to Scrum by combining it with RUP (Rational Unified Process). In his study, RUP was the frame of the project and Scrum would handle the management inside of RUP, e.g. the Scrum events, roles and artifacts.

Another study made by Sreenivas, Shahid and Anjan (2016) where Scrum was combined with FDD (Feature Driven Development). The study showed that Scrum-teams that worked with the combined method had less defects with their projects. It also showed that the customer satisfaction increased by ten percent according to the survey where the focus was on schedule, planning, communication, code standards and documentation (Sreenivas et al, 2016).
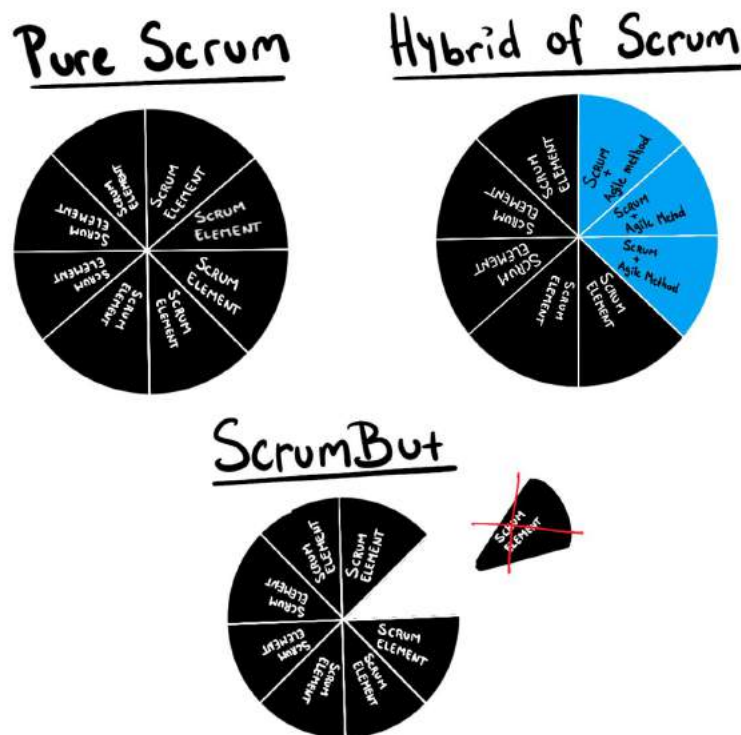
Figure 5. Authors own figure of different implementations of Scrum

Figure 5 presents different implementations of Scrum. A pure Scrum means that all of the Scrum elements are included into a workflow. A Hybrid of Scrum involves Scrum with another agile method. This means that one implements a pure Scrum or parts of Scrum and adds elements from another agile method into a workflow, hence the blue part. When implementing ScrumBut into a workflow, one leaves parts of Scrum out. As soon as any Scrum elements are not included, it becomes ScrumBut (Scrum.org, 2009). Ultimately, even though a Hybrid of Scrum or Scrum anti-patterns are seen in conducting Scrum, it is still Scrum, but in an adjusted manner.

4. Results

This chapter presents an overview of the gathered data. Initially the questionnaires will be presented followed with the interviews. The questionnaire will be presented separately with subheadings for each level. Managers will be presented by their respective company, Scrum Masters and Development Team Members by their company and Scrum-team. The interviews will also be divided into subheadings per company. Each subheading per company will then have additional subheading for the Scrum-team represented in each company. Due to the confidentiality, each company will be called Company X, Y and Z. The chapter concludes with a summarized result of the companies.

4.1 Questionnaires

The questionnaires were created on a free survey service online. It was then sent out to each participant via email. The online service also offered a feature where the authors could see that the questionnaires did not take more than five minutes to complete, in which was the general idea. The authors feared that if the questionnaires took too long to complete, the response rate would drop. In this case the response rate was 100%.

4.1.1 Managers

Questionnaire Manager	Company X	Company Y	Company Z
Q1. What's your current position in the company?	Project manager, Line manager, business developer	R&D Director	Head of department IT SU FF/SK
Q2. How long have you been working with your current position?	5 years	3 years	4.5 years
Q3. What's your educational background?	System Science and Law degree	Electronics engineer	Bachelor degree in Computer Science
Q4. How many teams are you in charge of?	3 teams	Approximate 15 teams	None
Q5. Do you have any experience in Scrum, if, how many years?	10 years	10 years	5-6 years
Q6. Do you have a Scrum-standard? Yes / No	No	Yes	Yes
Q7. Is Scrum the most common agile method in your company?	Yes	Yes	Yes
Q8. If the answer to the previous question is no, describe which agile method is the most common in your company?		Right now we use more Kanban process where daily re-prioritizing is possible. That is needed during integration of systems. During calmer periods we work more Scrum.	

Table 2. Questionnaire Manager

4.1.2 Scrum Masters

Questionnaire Scrum Master	Company X	Company Y		Company Z					
Teams	**Team XA**	**Team YA**	**Team YB**	**Team ZA**	**Team ZB**	**Team ZC**	**Team ZD**	**Team ZE**	**Team ZF**
Q1. What's your current position in the company?	Consultant manager, Consult, Business developer	Software team leader and developer	System Engineer	Team Leader	Team Leader	Team Leader	Team Leader	Team Leader	Product Owner
Q2. How long have you been working with your current position?	5 years	2 years	2.5 years	2 years	3 years	10 years	2 months	2.5 years	2.5 years
Q3. What's your educational background?	Master of Science in Engineering Physics	M.Sc. Mechanical Engineering	Technical college	IT related courses	M.Sc Computer	System Science	M.Sc Physics	Progr. Engin.	Computer Ec.
Q4. Do you have a Scrum-master certificate or similar?	No	No	Yes	No	No	Yes	No	Yes	Yes
Q5. How many Scrum-teams have you managed before?	20-30	5	2	2	0	5	0	10	2
Q6. Have you had any other position in a Scrum-team?	Scrum Master, Line manager, Project leader	Developer	Developer, Product owner	Tester, Test leader	Developer, Test leader	Tester and Specification Analyst	Tester and Test Manager	Developer and Product Owner	No
Q7. Are you currently using Scrum?	Hybrid of Scrum	Hybrid of Scrum	Hybrid of Scrum	Hybrid of Scrum	Hybrid of Scrum	Hybrid of Scrum	Yes	Yes	Hybrid of Scrum
Q8. If you are working with Hybrid of Scrum, what agile method do you combine?	Inspired by agile methods	We alternate between the SCRUM and KANBAN methods, close to external releases we usually go KANBAN.		Scrum and LeSS	Scrum, LeSS, Kanban	Kanban			Scrum and Kanban
Q9. Which of the Scrum events are you currently using?	Sprint Retrospective, Backlog Grooming, Sprint Review	All of them	Sprint, Daily Standups	All of them	All of them	Sprint, Sprint Retrospctive, Sprint Review, Daily Standup	All of them	All of them	Sprint Retrospective, Sprint Review, Daily Standup

Table 3. Questionnaire Scrum Master

4.1.3 Development Team Members

Questionnaire Development Team Members	Company X	Company Y		Company Z					
Teams	**Team XA**	**Team YA**	**Team YB**	**Team ZA**	**Team ZB**	**Team ZC**	**Team ZD**	**Team ZF**	**Team ZG**
Q1. What's your current position in the company?	Software developer/Consultant	Software developer	Technical lead	Test leader	Software Engineer	System engineer	System engineer	Tester	Software developer
Q2. How long have you been working with your current position?	1.5 years	17 months	1 year and 6 months	3 months	18 months	1 year	3.5 years	14 months	2 years
Q3. What's your educational background?	Bachelor degree in webprogramming	Bachelor degree in Electrical Engineering with focus on embedded design.	Mechanical engineering	Software engineer	Computer Science	System science	Bachelor degree in engineering	M.Sc Industrial management	Self-educated
Q4. Have you worked in a Scrum-team before?	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Q5. How long have you been working with the agile method Scrum?	1 year	17 months	5-6 years	8 years	18 months	1 year	3.5 years	14 months	9 years
Q6. Have you had any other position in a Scrum-team?	No	No	No	Developer, Scrum master, team leader, test leader	Team-leader	No	Developer	No	No
Q7. Have you worked with other agile methods besides Scrum?	Kanban	No	No	No	No	No	Kanban	Kanban	No
Q8. Which agile method do you favor the most?	Kanban or a hybrid method	None	Scrum	Xp	Scrum	Scrum	Scrum	Scrum	The ones that favors small increments and learn and adopt for each increment.

Table 4. Questionnaire Development Team Member

4.2 Interviews Company X

Company X was the smallest of the three companies based on the 25 employers in Jönköping, but this company could also be found in different cities around Sweden. Company X only focused on development. Some of the employees were also consultants, meaning they were working in other companies but employed by Company X. In this company there were one team which was interviewed. The following chapter will summarize the important parts of the interviews. *Appendix 3. Interview answers* will cover all the interviews conducted with definitive answers.

4.2.1 Manager

The manager stated that they did not have a Scrum standard, that their approach to Scrum was a combination of both Scrum and Kanban They selected parts from both agile methods which was best suited for them. He exemplified that Daily Standups did not work for them because there were Development Team Members that was not comfortable enough to share anything during these meetings. He meant that the real world is more complex than Scrum describes it, and Scrum cannot be applied directly to any project. Even though, the company did not have a Scrum standard, the Scrum-team had their own Scrum standard. He explained that the Scrum-team has an internal process that had to be followed in order to continue to the next process. The manager had also experience in Scrum before as a Scrum Master and as a Development Team Member. He stood close to his Scrum-team, with weekly meetings and helped the Scrum Master with impediments.

4.2.2 Scrum Master

The Scrum Master was not a pure Scrum Master as Scrum defines it. He combined his Scrum Master role as a Tester as well. Beside from that he had responsibilities of a Product Owner too. The reason for this was because the Scrum-team was not customer oriented enough, which led to dissatisfied customers. These responsibilities meant that the Scrum Master was the glue between the client and the Scrum-team. His role was described as a Team Leader, rather than a Scrum Master. He would make sure that the Scrum-team did what they were supposed to do.

The Scrum Master could also agree with the manager that the company did not have a Scrum standard. It would look different depending on where one would work. Each Scrum-team could have different approaches to Scrum. As long as his Scrum-team followed the client's specification, they could work freely. As of their Scrum, they did not define all the roles as Schwaber and Sutherland (2017) does. The roles that their Scrum-team defined within the Development Team was; System architect, Developer, UX Designer and Scrum Master. As he had the responsibility of a Product Owner, they did not define one, which is a result of short staffed.

He stated that they only used Sprint Planning and Backlog Grooming, the other Scrum events could not be conducted because they had no Sprints. Instead they used their own term, Pulses. Pulses happened weekly and monthly. The Scrum Master shared the same view of Scrum as the manager, Scrum cannot be directly implemented into their workflow, but their workflow would look the same whether they worked with development or maintenance. They worked with Scrum as much as their specifications allowed them to.

4.2.3 Development Team Member

As a Software developer his main task was to develop new software, but he was also included in some customer collaboration. When working with development, they were free to choose how they wanted to work, but when dealing with maintenance, their work was controlled. The Scrum Master checks in on them from time to time to see how their work is proceeding, but as they are experienced Developer, they do not need much guidance.

He also said that they did not have any Sprint, but instead Pulses. He also confirmed what his colleagues said about Sprint Retrospective and Daily Standups; nonexistent. They worked in an agile way, but not as Scrum describes it. He also stated that they did not have a Scrum standard, and that Scrum feels like an ideology, where they only select the good parts of Scrum to work with.

4.3 Interviews Company Y

This company had around 40 employees based in Jönköping, where they cooperate with their coworkers in China. Company Y worked with both development and maintenance. Software and hardware were divided into two departments, working parallel with each other. Interviews will be conducted on both the teams. The following chapter will summarize the important parts of the interviews. *Appendix 3. Interview answers* will cover all the interviews conducted with definitive answers.

4.3.1 Manager

The manager's role was Head of Department, in the software department. He had experience in all the three roles; Product Owner, Scrum Master and Development Team Member. He stated that they had no Scrum standard, instead they worked with ScrumBut. This meant that they left parts of Scrum out, the reason was because they were short staffed. This also resulted in having no Product Owner in his department. But he considered some Scrum elements important in a Sprint; Product Backlog, Daily Standups and Sprint Review. In some cases, Scrum was combined with Kanban, where Kanban was used in the final stage of the project mostly for test purposes and handle the known bugs.

The two departments worked differently, where the software department approached Scrum the most and the hardware-department worked more towards Scrumban. This was because the hardware-department lack experience in Scrum. Some Development Team Members were specialist in some areas, and some combined their roles to also make up for the lack of personnel. Both departments have a common Sprint Review, because they work parallel with each other.

4.3.2 Scrum Master

The Scrum Masters at Company Y's workload looked different in some respects due to the fact that they were working in different teams. Not only did they have different workloads, but their experience differed as well.

4.3.2.1 Team YA

Team YA represents the software-department. Just like the manager stated, they did not have all the roles that Scrum defines, because they were short staffed. This meant that the Scrum Master had taken upon the missing role together with the manager, as well as being a Developer. The Designers also had to combine their role, which they now were responsible for both design and testing. He also confirmed that they did not have a Scrum standard, that they implemented parts of Scrum to their workflow.

As of the Scrum events, they conducted all of them, but not exactly by the book. He meant that their way of working was never a pure Scrum, but it was not carved in stone either, making their way of working vague. When talking about the Scrum-team, he said that they were very independent. Aside from being a Developer, he only included himself in the Scrum-team during the planning phase of the project.

4.3.2.2 Team YB

Just as in the software-team, the hardware-team did not have a Product Owner either. The Scrum Master explained that he had experience in being a Product Owner, and therefore could go without one. That is why his responsibilities included being a Product Owner as well. He explain that the hardware-department had specialized skills for the given responsibility, making them not multi-functional. They also only recognized Daily Standups, Sprints and Sprint Reviews. The Scrum Master explained that they did not have all the Scrum events, because it was too time consuming.

Their Scrum approach was not pure either, because they combine Scrum with Kanban, which meant that they worked with a Hybrid of Scrum, Scrumban. But this was not a combination per se, but rather they switch from Scrum to Kanban in the end of the Sprint. Regardless of what kind of project it was, the workflow would always stay the same.
He also said that the Scrum-team are independent, that they decided how they wanted to work. They had a daily interaction, because they were stationed next to each other.

4.3.3 Development Team Member

The Developers had it differences in working in different teams, software and hardware. This meant that their work was different as well.

4.3.3.1 Team YA

The Developer in the software-team was responsible for tasks as Scrum described it. He developed the software for the project. It was also confirmed with the Scrum Master that the software-team did not work with a pure Scrum, rather an adapted Scrum in their projects. The cooperation between the Development Team Members could be as; one would develop the software, and one would review the software.

Just as confirmed, the Daily Standups was not by the book, but the Scrum-team did not mind because it was to their liking. The Sprints was three weeks, and in the end of the Sprint a Backlog Grooming was conducted to see what needed to be prioritized. As of the Sprint Retrospective, these were conducted as Schwaber & Sutherland (2017) says, as well as Sprint Reviews. When choosing tasks, it was the specialists that choose the tasks that they were most comfortable with before any other tasks. He also stated that a combination of Scrum and Kanban was conducted in the projects.

4.3.3.2 Team YB

The Developer in the hardware-department had a title that described a leading role, Technical Lead. As a Technical Lead, he was in charge of the mechanical engineers in China, where Company Y had other teams. But the interaction was not face to face, but rather digitally. This did not mean that he combined his role, rather than the leading role was a part of his responsibility. He explained hardware and software go hand in hand, but the adapted Scrum looked different, just as the Scrum Masters confirmed.

They did not have Daily Standups regularly, due to the size of the team, as they were stationed close to each other. He rather suggested that the team had meetings whenever they faced a problem. What the hardware-developer said about the Sprints did not really add up to what the Scrum Master and the Manager said though. He meant that the Sprints were about two weeks but that they have been sloppy, meaning they did not deliver what they were supposed to during the two weeks. This was because they lacked resources, and estimations were not made either. They would just develop what needed to be develop.

What is interesting between the two teams are internal communication. He stated that Company Y have a Scrum Standard, but this can only be applied in the software-department. But when asking his colleague, none of them said that they had a Scrum Standard. The hardware-department would just use it as a checklist. Regarding the Scrum-team he meant that it was the Scrum Master that decided what they were going to develop. But the Scrum Master would take Scrum-team thoughts into account.

4.4 Interviews Company Z

In this company there was seven Scrum-teams which was interviewed; Team ZA, ZB, ZC,ZD, ZE, ZF and ZG. It was not to our knowledge that two of the Scrum-teams did not belong to any of the interviewed Scrum Master (Team ZF and ZG), hence not being able to apply the data triangulation on those Scrum-teams. Each Scrum-team has different Product Owners, when addressing the Product Owners in the teams, it is not the same Product Owner. Nor was it to our knowledge that one of the interviewed Scrum Master was in fact a Product Owner, meaning this company will include a Product Owner. The following chapter will summarize the important parts of the interviews. *Appendix 3. Interview answers* will cover all the interviews conducted with definitive answers.

4.4.1 Manager

The manager of Company Z was entitled as Head of Unit. His role reminded of a typical manager, where his main tasks was recruitment, budget and wage for example. He managed several Scrum-teams indirectly, he meant that he managed the Scrum-teams by managing the Scrum Masters. He acted as a bridge between the Scrum Master and the Scrum-team. He had no experience in a Scrum-team before but had a Scrum Master-certificate.

He stated that the company did not have a Scrum standard, but instead had an administration manual, which described how the Scrum-team should conduct their work. The administration manual was not followed by everyone though, because some of the Scrum-teams also included Kanban into their workflow. As of the Scrum events, he said that the Scrum-teams was conducting all of them, but not by the book. He did not know in detail how they conducted the Scrum events, though.

Together with the Scrum Masters, he would plan for resources and competence for each project, but also be responsible to guide the Scrum-teams in the right direction. He did not manage any Product Owner, instead they defined two other roles; Information Manager and System Administrator. These two roles had one goal in common, to synchronize the clients and the Scrum-teams.

When talking about the Scrum-teams, he said that they were very independent. The Developers was in charge of developing, and his aim for them was to be multi-functional, but they were not there yet. This was because the Scrum-teams was bound to the specifications and had to work accordingly.

4.4.2 Scrum Master

In Company Z all the Scrum Masters are recognized as a Team Leader and are called accordingly. The reason is because Scrum does not define a Team Leader, and there are tasks that requires a Team Leader within the company, which is why Company Z added the Team Leader role to the Scrum-teams.

4.4.2.1 Team ZA

This Team Leader was in charge of a big project, in which included three Scrum-teams, and he was Team Leader of two of them. His role also included an administrative role, which meant that he was in charge of getting all the Team Leaders on the same page. But his main tasks where to facilitate meetings and guide the Scrum-team to the right direction.

He continued to explain that they did not have any Scrum standard but used the framework LeSS (Large Scale Scrum) instead, which is a larger version of Scrum. This was due to the size of the project. By conducting LeSS, it would include two different Sprint Planning meetings instead of one, where the first one was a discussion between the Team Leaders and the second one was to plan the Sprint with all the Scrum-teams. Continuing talking about the Scrum events, he meant that they were conducting all of them, but not by the book as they had adjusted them to fit their needs. For instance, he explained that during the Daily Standups, they would also review the Scrum-board, and they would also conduct a "Overall Retrospective" which included all the Scrum-teams in the project.

For this project they also included three Product Owner due to its size. All three of them had their own area of responsibility, but all of them was in charge of the Product Backlog. As they were three Product Owners, it was important for them to conclude a joint decision regarding the Product Backlog. During the different Sprints, the Scrum-teams could work with different Product Owners, which meant that it was hard for the Product Owners to get an overall picture of the Sprint. The Scrum-team decided upon how they wanted to work, he only cared about the output.

4.4.2.2 Team ZB

Just as the Scrum Master in chapter *4.6.2.1 Team ZA,* this Team Leader explained that they also used the framework LeSS. His tasks were to facilitate meetings, support the Scrum-team and guide them in the right direction. There was also a lot of planning because they had several Product Backlogs as they were working together with several Scrum-teams.

The Scrum-team themselves decided how they wanted to approach their tasks making them independent. As of the Product Owner, they had five different Product Owners, but they only worked with one of them. The cooperation between the Scrum-team and the Product Owner only occurred when reviewing the Product Backlog. As of the Team Leader and the Product Owner, this cooperation only happened during planning phase and Sprint Reviews.

He said that the company did not have a Scrum standard, but his Scrum-team had a Scrum standard, which was documented with defined roles; Team Leader, Developer, Tester, Test Leader, System Architect, Delivery Manager and Specification Analyst. No roles were combined expect the Team Leader's where he could step in as a Tester or System Architect.

All of the Scrum events were also conducted, but some of them deviated from the what is defined in Scrum. They would also combine Scrum with Kanban, because Kanban allows them to complete tasks as they come.

4.4.2.3 Team ZC

The role as a Team Leader in this Scrum-team was to coach the Scrum-team so they could reach the goal of the Sprint. He facilitates all of the meetings within the Scrum-team. But his role could sometimes be combined as a Tester and Specification Analyst.

When asking about a Scrum standard, he referred to the Administration manual, but it was not followed due to it is not up to date. Instead he suggested that every Scrum-team works towards their own Scrum standard, but his Scrum-team would approach an adjusted Scrum. It was also the Scrum-team that decided on how to work. The Scrum-team consisted of Developers, Testers and him as a Team Leader. Instead of including a Product Owner, they included a Information Manager instead, as mentioned in chapter *4.6.1 Manager.*

As they were working with maintenance and had four different clients, their Sprints were two weeks. Four clients also meant that they worked with four different Sprint Planning meetings as well as four different Product Backlogs. As of the Scrum events, he said that they excluded both the Sprint Retrospective and Backlog Grooming.

The Team Leader explained that how they approached Scrum would look different whether they worked with development or maintenance. In development, there were more roles and meetings included. He meant that all the Scrum-teams works agile, but their approach looks different, hence no company Scrum standard. In his Scrum-team they would also combine Kanban with Scrum, for smaller tasks did not need the elements that Scrum offers and it was more convenient to use Kanban.

4.4.2.4 Team ZD

The Team Leader in Team ZD is in charge of two teams where one of them are not using Scrum. His main tasks are to facilitate the meetings they have within the Scrum-team. He is solely Team Leader in the teams and do not combine his role. According to him, the company did not have a Scrum standard, but his Scrum-team had their own Scrum standard. The Scrum-team aims to be multi-functional but are not due to the fact that the Testers only task is to test software.

Within the Scrum-team there is him as a Team Leader, Tester and Developer. They also work with two Product Owners, but they are not a part of the Scrum-team. Regarding the Scrum events, all of them are conducted within the Scrum-team, but the Sprint Retrospective deviates from what Scrum defines it. He also confirmed what is said by his colleagues, that every Scrum-team works differently. Different projects need different adjustments.

4.4.2.5 Team ZE

His role as a Team Leader was to help everyone in the Scrum-team understand Scrum, facilitate meetings and remove impediments. Besides the role as Team Leader, he did not combine any other roles or responsibilities. He added that the Scrum Master and the Team Leader should not be the same person, but the company is short-staffed and cannot separate these roles.

He said that his Scrum-team has a Scrum standard, and that he was striving for a pure Scrum within his Scrum-team. This meant that his Scrum-team conducted all the Scrum events by the book. He also stated that they were working with a pure Scrum methodology. But there is one thing that deviates from Scrum, which is that Team ZE was not multi-functional.

4.4.3 Product Owner

As a Product Owner he wanted to know how his team was thinking and thought of the work, he wanted to get insight of the developed work. His main responsibilities were the developed product and keeping in touch with the stakeholders. He saw himself as the bridge between the Developer and the client.

He stated that it was the Team Leader who was in charge of the Daily Standups and the Sprint Retrospective. How this is done was discussed between Team Leader and the Development Team Members. He meant that as long as one had the knowledge of Scrum, it could be very flexible. His Scrum-team worked according to Scrum, but with some deviations, like before conducting the Sprint Review, he wanted to have a personal Sprint Review. This is for ensuring the client's desires. He added one thing to the Sprint Retrospective, though. He did not only want to know what could be better in the Sprint. He also wanted to know if anything else could be better, like the light from the lamps was good enough for example.

The workflow of the project can look different from time to time, but only because they are dependent on other teams. The Scrum Standard could look different depending on the teams, but ultimately, the foundation of Scrum looked the same.

The team was very independent, they could work however they wish. The Product Owner only cared about the finished product. The interaction between the Development Team Members and the Product Owner occurred mostly during the meetings.

When asking the reason for combining two agile methods, he answered that when unfinished tasks are moved over to the next Sprint, the team would complete the tasks as they come. He meant that this was a continuous circle that would never end, that this is the springboard for combining Scrum and Kanban.

4.4.4 Development Team Member

This chapter presents the Development Team Members from each Scrum-team.

4.4.4.1 Team ZA

The chapter *4.6.2.1 Scrum Master* describes a Scrum Master with two teams. In this chapter those two teams will be presented.

When interviewing Team ZA, there was only one of them that explained his role by the book. He was one of the Testers, which responsibilities was to ensure that the tests fulfilled the requirements, but he said that the requirements could be vague as the requirements would vary depending on the project. The second one was a Developer; he was responsible for ensure the quality of the software and provide the best conditions for the Scrum-team.

One of them agreed on that the Scrum-team consisted of the roles defined by the book. He meant that the Product Owner was a part of the team, but the other one did not consider the Product Owner as a member of the team. Both of the Scrum-teams did also combine roles, but they would only combine the Developer's role and the Tester's role.

Both the Development Team Members agreed that all the Scrum events were conducted, but some Scrum events deviated from the original Scrum. The Backlog Grooming was to be conducted in one of the teams but would sometimes not be conducted. The Sprint Review was the one event that differentiated the most. One Scrum-team had the Sprint Review after each Sprint for each client which would take about 15 minutes. The other Scrum-team had a joint Sprint Review with all the Scrum-teams, and sometimes what they called a "Mini-demo". The "Mini-demo" was conducted during the Daily Standups for the Specification Analysts for transparency. The Developer said that it has always been like this. The Tester on the other hand said that changes are continuous. The Tester exemplified that they changed the way of how they do Sprint Reviews and how they break down tasks.

The Developer added that he thought of the agile framework as a fence, inside the fence is Scrum. Jumping out of the fence was a metaphor for no longer working in Scrum. He meant that Scrum is as flexible as the fence allows. Both of the Scrum-teams were very independent, managing their own work. But one of the Scrum-team was limited by other Scrum-teams, because they had to sync with each other. For that the Scrum-team were a part of a bigger project.

The cooperation with the Team Leader looked different from the Scrum-teams. The Tester explained that the Team Leader went on meetings and debriefed the Scrum-team, so that the Scrum-team did not have to go on the meetings. He continued and said that the Team Leader held the meetings if he was present. The Developer said differently, he meant that the Team Leader would remove impediments, visuals the complexity of the project so that the Scrum-team got a better understanding. He would also provide with resources needed for the Scrum-team. The Developer added that they could always speak to the Product Owner, because he was always present. The Tester on the other hand meant that their Product Owner was very busy, and only meet the Product Owner during the morning meetings.

4.4.4.2 Team ZB

In Team ZB the interviewee described his role as Software developer where the main task is to develop new software. He does not combine his role with another within the Scrum-team, but the task assignment could go beyond developing. Nor does his Scrum-team combine any roles. The Team Leader was the one that keeps track of the Scrum-team, he was the one that helps the Scrum-team understand Scrum.

From his own experience he considered that all the Scrum events are included in, but they are carried out in different ways. The Daily Standups for instance are done a bit differently than Schwaber and Sutherland (2017) describes it. The underlying structure of how they work has always been the same. The Scrum events have always been the same but how they implement it has been different. For example, the Sprint Review has changed. They used to have showcase the Product Increment for 80-100 people, included stakeholders. But the Scrum-teams thought it was difficult to present in front of a crowd.

Since the Team Leader has other tasks to deal with, the responsibility lays on the Development Team Members. This means that the Scrum-team are very independent. As of the Product Owner, they have frequent contact with them if they have questions about the Product backlog.

4.4.4.3 Team ZC

Team ZC was represented by a Developer. Her tasks could differ, from database to backend and frontend. In her Scrum-team, they did not combine any roles. But before handing over her software, she would test it by herself first. The Scrum-team consisted of eight members. Seven of them was Developers with different orientations and one Team Leader. As they were working with a lot of different systems, she was not sure if they had a Product Owner.

When she discussed the Scrum event, she confirmed what her Team Leader said about the Scrum events, that they excluded the Backlog Grooming and Sprint Retrospective for example. She continued to explain that Scrum looks different depending on how the Scrum-team is composed, like how long the Sprints are for instance. The Development Team Member then decides which tasks they are going to do depending on the Developer's competence. The Team Leader keeps track of everything they do and removes impediments.

4.4.4.4 Team ZD

The Development Team Member of Team ZD describes his role as Software developer where the tasks are to deliver new software. He did not combine any other roles within the Scrum-team, but when it is needed, he helps with testing the software. It all comes down to finish the Sprint, so if help is needed, he will provide it. The Scrum-team consist of one Team Leader, two Testers and four Developers. They have a defined Team Leader role, but if the Team Leader is not present, one in the Development Team Members steps in and take his role. But the contact with the Team Leader are regularly. They also have two Product Owners, one for each system. They try to be as multi-functional as possible but depending on the situation they choose tasks that they feel comfortable with.

According to the Developer, his Scrum-team conducted all the Scrum events, but just like most of the Scrum-team in Company Y, they too had some deviations from the original Scrum. The

Sprint Review could look different, depending on the Sprint. If an implementation cannot be visualized, the Scrum-team just talks about it instead.

How they have worked with Scrum has been different. The Sprint Reviews for example, have not always been conducted. When he was new in the Scrum-team the Product Increment was handed to the Specification Analyst. The Specification Analyst would later approve or disapprove. Changes has been made to resemble Scrum.

4.4.4.5 Team ZF

Team ZF were represented by a Tester, she was responsible for testing the software. The roles in her Scrum-team was by the book; Scrum Master, Product Owner and Developer team. They did not combine any roles, and also had a Scrum Standard. She added that her team was a part of a bigger project.

Regarding the Scrum events, she said that they were conducting all of them. But because they were a part of a bigger project, it included multiple Scrum-teams. She meant that they implemented the framework LeSS. The framework LeSS also meant that their Sprint Review was a joint meeting, putting the Product Increment from all the Scrum-teams into one Product Increment and presenting it. All the Scrum-teams would also have respectively meeting the same day, due to LeSS.

She implied that the workflow did not differ between development and maintenance, it would always look the same. When asking about the Scrum-teams, she mentioned that the Scrum-team was independent, they were only restricted by the priorities in the Product Backlog. She ended the interview with saying that some tasks needed to be done within a limited timeframe, therefore also combining Kanban, for it was more flexible than Scrum.

4.4.4.6 Team ZG

The Development Team Member in Team ZG described himself as a Software developer. He explained that he was in charge of deciding which techniques that the Scrum-team would use during the development. He also mentions that when the Team Leader is not present, he steps in. The Scrum-team consist of five Developers and two Testers and one Team Leader. In some cases, the Team Leader helps with testing when it is needed.

His Scrum-team recognized all the Scrum events, except the Backlog Grooming. They also implemented the framework LeSS, which is why they had two Sprint Planning meetings; Sprint Planning one and Sprint Planning two. During his time in Company Z the way of working with Scrum has changed. Recently they have added the framework LeSS because of the size of the project, which involves multiple teams.

They are responsible for the Sprint to succeed, which gives them plenty of freedom. According to him the Team Leader is not very involved in the Scrum-team. The Team Leader is mostly involved in the planning phase.

4.5 Results Summary

In the end, the authors found that the companies as well as the Scrum-teams were different, but they all had some similarities. Below in table 5 is an overview of the companies. It visualizes the companies Scrum elements and agile methods.

Teams	Company Z							Company X	Company Y	
	Team ZA	Team ZB	Team ZC	Team ZD	Team ZE	Team ZF	Team ZG	Team XA	Team YA	Team YB
Events										
Daily Standups	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Sprint planning	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Backlog Grooming	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No
Sprint Review	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Sprint Retrospective	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	No
Sprint Length (weeks)	3	3	2	3	2	3	3	No Sprints defined	2-3	2-3
Roles										
Scrum Master	No	No	No	No	No	No	No	Yes	Yes	Yes
Product Owner	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	No
Development team	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Articfacts										
Sprint Backlog	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No
Product Backlog	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product Increment	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Company Scrum Standard	No	Team Standard	No	Team Standard	Team Standard	Team Standard	No	No	No	No
Multi-functional	No	Yes	No	No	No	No	No	No	No	No
Hybrid of Scrum										
Kanban	No	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes
Scrum of Scrum	LeSS	LeSS	No	No	No	No	LeSS	No	No	No

Table 5. Summary of the results from the companies

5. Analysis

The following chapter will analyze the collected data and answer the research questions. Each research question will be answering each company individually.

5.1 How do the companies follow the defined Scrum?

5.1.1 Company X

Based on the questionnaires and the interviews from Company X, the authors could undoubtedly agree on Company X not following Schwaber and Sutherland (2017) definition of Scrum. When conducting the interviews, it reveals that the company had their own take on Scrum, depending on the projects and teams it would look different. The team did not recognize any Sprints, instead they were called Pulses. The Pulses looked similar to how a Sprint and the Sprint Review are conducted. Schwaber and Beedle (2001) explains that the Sprint Review is held once each Sprint. Instead, Company X had two Sprint Reviews, one weekly and in the end of the second Pulse. This differs from how Schwaber and Sutherland (2017) describes it. They explain that the product should be presented after each Sprint and not weekly. The reason for the company having weekly reviews was for the project they were working on demanded weekly contact because of the project's complexity. The Pulses length could vary depending on the workload and if new tasks were added. If we refer the Pulses to Scrum Sprints, the length of the Pulses is an anti-pattern according to Eloranta et al (2015). Eloranta et al (2015) describes that the varying of the Sprint length could lead to bad customer experience.

There was not any Daily Standups or Retrospectives. The reasons for not having any was that they all sat in the same room which allowed the team to communicate frequently. Considering the size of the team, it would be a waste of their time. Instead, a meeting at the end of each week took place which looked similar to a Daily Standup, but longer. Schwaber and Sutherland (2017) describes that a Daily Standup meeting is held to remove, highlight and promote quick decision-making. But as the Scrum-team is small in size and sits in the same room, a Daily Standup feels like it is more suitable for bigger teams that are not placed close to each other, in this particular case.

Company X only had a Product Backlog and not any Sprint Backlog, or Pulse Backlog in this case. The Development Team Members decided for themselves how to estimate the "work package". The opposite for this is that the Development team is given an already estimated task which Eloranta et al (2015) describes as an anti-pattern as well. Eloranta et al (2015) explains that the Scrum-team should estimate the tasks for themselves which in this case they did.

The roles they recognized within the team was System Architect, Developer, Scrum Master and UX designer. In total there was six members in the Development team. According to Schwaber and Beedle (2001) the team should be between three to nine members to be as productive as possible. One role that was missing in Company X was the Product Owner. This role was combined with the Scrum Master's role. This is a big step away from Scrum's principles. The Scrum Master's role should not be combined with another role. Doing this could result in confusion within the Scrum-team and lead the Scrum-team to wrong paths (Schwaber & Sutherland, 2017).

To conclude Company X, they do not follow Scrum or define it as Schwaber and Sutherland (2017) does. Instead, they took parts of Scrum and implement it to fit their context. Depending on which stage of the project they worked with, the Scrum-team would work towards Scrumban. The three levels confirmed what they said about their work. Both Scrum and Kanban are similar to each other

which makes it convenient to combine them with each other according to Company X. As Sjøberg et al (2012) states, Kanban is effective when you are close to the end of a project and when sudden problems are arising, for example when sudden bugs are detected. With Kanban one can be more flexible which in Company X case was the reason for combining Scrum and Kanban.

5.1.2 Company Y

Benbasat et al. (1987) explained that reality is limited by the availability in the companies. This is true for Company Y, as they lacked personnel. When conducting the interviews, it was clear that this had a large impact on the company. The lack of personnel meant that the Scrum events did not seem useful, as the events was too time consuming for a small group of people. This also affected the workload of the teams, for they had combined roles to compensate for the missing roles, in order to finish tasks.

The missing roles did also impact the Scrum artifacts described by Schwaber and Sutherland (2017). As stated in chapter 3.4.1 *Product Backlog*, it is the Product Owner that should be in charge of it, but because Company Y did not have a Product Owner, the Product Backlog-assignment had been distributed to someone else. In this case it was the Scrum Master and the Manager.

The Designers in the company had a lot of work as well, for their workload included both testing and designing. The teams compensate this though by letting the Developers test their own software. But this could be problematic, keeping in mind what Runeson and Höst (2008) said. Runeson and Höst (2008) meant that it is beneficial to let different people look through the work of another person to reduce the bias of individuals. This is not done in Company Y, as Software developers has the authority to test their own software before committing it to the project.

As of the Scrum events used in Company Y, the two teams worked differently. The hardware-team did not have all the Scrum roles that Schwaber and Sutherland (2017) defines. They could only recognize Daily Standups and Sprints. The Developer in that team argued that the hardware-team lacked the competence in Scrum, hence only using two Scrum events. But Schwaber and Sutherland (2017) means that the Scrum Master should help everyone in the team to understand Scrum theory, practices, rules and values, which is apparently not done by the Scrum Master.

The software-team did not follow the defined Scrum by Schwaber and Sutherland (2017) either. Even if all the Scrum events could be recognized in this team, they did not follow the guidelines for the events. As the Scrum Master mentioned, the Daily Standups could take up to one hour for example. Schwaber and Sutherland (2017) set these guidelines to not waste any time during Sprints. But during the interview with the Scrum Masters, these one-hour meetings was not relevant for the whole team, meaning this would take up the team's time.

Even though some of the roles within the Development teams are combined in Company Y, it does not say that the Development Team Members are multi-functional, as Schwaber and Sutherland (2017) says a team should be. The data gathered from the interviews meant that some members in the teams did not have the competence of working in other roles. This did not apply to everyone though, for the questionnaire told the authors that some members had worked with other roles in a Scrum-team before.

What is mentioned above can be associated with what Eloranta, et al. (2015) says about anti-patterns. Eloranta, et al (2015) means that these are harmful practices which will hurt the project and the team in the long run, which is discovered in the interviews with one of the Developers. The

interview with the Developer meant that Sprints were two weeks, but the team has been sloppy and did not deliver what they were supposed to during the two weeks.

5.1.3 Company Z

The Manager in Company Z was in charge of several teams. He stated that the management was not face to face, which Denscombe (2016) says is important. Denscombe (2016) meant that it is important because it will reduce the misunderstanding between the two parties. But the Scrum-teams could always reach out to the Manager for feedback, which Schwaber and Sutherland (2017) describe as important for the transparency in a Scrum-team. The Scrum-teams was also independent, deciding how to work, which is also defined by Schwaber and Sutherland (2017).

In chapter *4.6.1 Manager,* he stated there was no Scrum Standard in the company, but rather an administration manual, which describe how the teams should work. But during the interview with the both the Development teams and the Team Leaders, only two of them mentioned something that could resemble the administration manual. This could suggest miscommunication between the teams and the Manager or that the Manager did not fully know how the teams work, which he mentioned in the interview. This could be the consequence of not interacting with the teams face to face as Denscombe (2016) describes.

Chapter *4.6.1 Manager* also states that the Team Leader should plan the needed resources of a project with the Manager. This is somewhat true when keeping in mind what Schwaber and Sutherland (2017) says. Schwaber and Sutherland (2017) meant that this resource planning should happen between the Scrum Master and the Product Owner. Aside from that, the Team Leader had responsibilities that Schwaber and Sutherland (2017) describes, like being a sounding board for the team and removing impediments.

It was clear during the interviews with Company Z that in some cases, not all of the roles were defined as Schwaber and Sutherland (2017) defines. To compensate the missing roles, they were combining roles in order to finish tasks. This implies what Benbasat et al. (1987) says, that reality is limited by the availability. But what is interesting is that of all the interviews conducted in Company Z, there was only one person that described Scrum by the book, the only deviation was that he was a Team Leader instead of a Scrum Master. This could prove what Kuhrmann et al. (2017) say is true. That the most common agile methods are Hybrid of Scrum or leaving out parts of Scrum.

Campanelli and Parreiras (2015) mentioned that the biggest challenge with Scrum is to implement it, that the whole organization needs to embrace the agile way of thinking. This could be true for Company Z because of the Manager did not know in detail how the teams work. Campanelli and Parreiras (2015) suggests that everyone in the company must educate them self in Scrum in order to succeed in implementing Scrum.

What could be seen in most of the Scrum-teams was a customization of the agile method, this was to fit the needs of the team. The customization was mostly leaving parts of Scrum out or combining Scrum with Kanban, in which suggests what Tripp and Armstrong (2018) states is true. Due to the flexibility of the agile methods, companies often customize the methods to fit their specific projects.

What is said in chapters *4.6.2 Scrum Master* and *4.6.4 Development Team Member* differ to some extent, like how the teams was conducting the Scrum events and which roles in a Scrum-team are

defined. But ultimately, they all followed the foundation of Scrum. Even if some teams had combined agile methods, the foundation was still Scrum with some parts of the other agile method. Company Z did not have a Scrum Standard that all the teams follow, but rather the teams had their own Scrum Standard, which they would follow.

5.2 To what extent does the teams follow the companies' Scrum Standard?

5.2.1 Company X

The interview with the Manager in Company X clarified that the company did not have any Scrum Standard. There was nothing on paper that stated how the company should work with Scrum. The teams within the company instead decided upon them self how they wanted to work and adapted their work. This was because of the different projects they worked with and limitations from the client's specifications. The Company worked more towards Scrumban as well as ScrumBut. They left out parts of Scrum, hence working in ScrumBut (Eloranta et al, 2015). The team used some Scrum-elements but did not named them as Scrum does. They called them Pulses instead for instance.

It was clear that Scrum as Schwaber and Sutherland (2017) defines it could not be directly implemented on how they worked. The customers they worked with was sometimes vague with the specifications which meant that they could not implement Scrum purely. They needed to adapt to change quickly and with Scrum this was hard. Company X had the agile mindset, and this was also how it felt like when interviewing Company X. According to what the company said they did not follow Scrum by the book and each team within the company had their own standard.

5.2.2 Company Y

When asking the decision-making body in Company Y, he said that they did not have a Scrum Standard. The way they worked with Scrum is not as Schwaber and Sutherland (2017) explains either, but rather their own version of it. He called it just as Eloranta, et al (2015) did, ScrumBut. This was clear to the authors even when looking through the Scrum Masters questionnaires. Both the Scrum Masters could agree on the teams not following Scrum. The questionnaire also revealed that the teams did not follow the same way of working. This could suggest that the teams or Company Y having multiple ways of working.

As indicated in previous chapters the software-team followed Scrum as far as their resources allowed them. Like Papatheocharous and Andreou (2014) said in chapter 1.1 *Problem Statement*, the main reason for failed implementations of Scrum is the lack of knowledge or experience. This did not seem the case for Company Y, for the company switched between Scrum and Kanban which is done deliberately as indicated in chapter 4.5.1 *Manager*. What the interviews suggested was that the software-team implementation of Scrum did not follow what Schwaber and Sutherland (2017) says, due to the fact that they were short-staffed.

As of the hardware-team, the interview with the hardware-developer meant that there were only a few Scrum-elements implemented in their workflow, which is because of what Papatheocharous and Andreou (2014) explained, lack of knowledge and experience. But this seemed odd, due to the fact that the Scrum Master's questionnaire revealed that the Scrum Master had quite an experience in Scrum.

5.2.3 Company Z

Company Z did not have a Scrum Standard, but rather an administrator manual that the teams should follow mentioned in *section 4.6.1 Manager*. This manual described how the teams should work within development and were not Scrum specific. Some Team Leaders also mentioned it, but they thought it was outdated and was not followed. It could not be applied to the way they worked.

Keeping in mind that Company Z is such a large company with over 900 employees it seems reasonable that all the Scrum-teams are approaching Scrum in different ways. It varied greatly from team to team. All of the Scrum events which are described by Schwaber and Sutherland (2017) is used by the Scrum-teams but how they are executed looked different. Only one team followed Scrum by the book, team ZE. This team had all the Scrum events and were carried out as Schwaber and Sutherland (2017) define them. This could be because of the Team Leader having experience from coaching teams before and the projects they are working on allows them to.

What the Scrum-teams had in common were the roles within the Development team. They all had Software developers or Testers. But these roles were often combined in the teams. As Schwaber and Sutherland (2017) describes, the Development Team Members should be multi-functional and should not define any roles in the team.

One project that Company Z worked with involved multiple Scrum-teams. The reason for this was because of the size of the project. They were then forced to include the LeSS framework so they could manage all the teams. Because of this the teams worked parallel with each other and followed the same Sprint. The teams within the Sprint had to have the same Scrum events so one could argue that the project forced them to work according to a Scrum Standard within the project. But Company Z do not have a Scrum Standard rather it is the Scrum-teams that set their own standard.

5.3 What common factors lead to the adjustment in Scrum-teams?

One major factor that could be seen in all three companies that resulted in not following a pure Scrum was that they were lacking personnel. As they were lacking personnel, the teams did not have all the roles or Scrum events. To compensate the missing roles, the teams had to combine their role with another. The missing of Scrum events led to deviations, meaning the teams would work towards ScrumBut. Some could also agree on that Scrum is meant for change, and as long as one has the knowledge of Scrum and understand Scrum, one could bend it. However, but when doing this, it is not Scrum anymore according to Schwaber and Sutherland (2017).

In some teams the authors could also find the adjustments in Scrum was because the team did not fully understand the roles. But this was mostly found with the Scrum Master and the Product Owner. This meant that they would in these cases include other responsibilities outside their roles, or even break down the role's responsibilities, into two roles. Eloranta et al. (2015) describes the same anti-pattern, *Product Owner without authority,* where they explain that there exists insufficient understanding of the role as Product Owner, which could be seen in chapter *4.6 Interviews Company Z*. Within the Development teams, there should not be any defined roles but in all of the interviewed teams, there was. The teams defined Developers and Testers as titles, but according to Schwaber and Sutherland (2017) there should be no sub-teams. All of the teams in Company Z called their Scrum Master as Team Leader, which according to Eloranta et al. (2015) is an anti-pattern. Eloranta, et al (2015) means that when doing this the responsibilities of the Scrum Master becomes vague.

The authors also interviewed cases where Papatheocharous and Andreou (2014) stood correct, as some teams did not work fully in Scrum due to lack of knowledge. This led to not conducting all the Scrum events. As the teams did not use all the events and implemented another role not defined by Schwaber and Sutherland (2017), it could often be seen that the team having their own Scrum Standard. This Scrum Standard was never by the book but adjusted for the team.

Another major factor that could be seen in most cases was that the teams combined Scrum with Kanban, Scrumban. The reason for combining the two methods was always the same, because Kanban in some situations was more flexible than Scrum. Particularly in the end of the Sprint, when the Testers found bugs that needed to be dealt with. Scrum would not allow dealing with the bugs until next Sprint. Kanban on the other hand did allow this.

Schwaber and Sutherland (2017) explains that a team should be multi-functional, but the majority of interviewed cases revealed that the teams was not multi-functional. The teams would rather choose the tasks based on competence. Eloranta et al. (2015) describes this anti-pattern as *Semi-functional Teams* which could lead to a less committed team and outsourcing of tasks.

The table below represents the most occurring common factors between the teams that was discovered in this research.

Common Factors	Consequences
Lack of personnel	Roles are combined and Scrum events are not used.
Undefined Roles	Misunderstanding about who does what.
Lacking knowledge about Scrum	Scrum events and roles are left out.
Bugs at the end of the Sprint	Scrum is combined with Kanban to solve sudden bugs.
Semi-functional Teams	The tasks need expertise outside of the Scrum-teams to solve the tasks.

Table 6. Summary of the common factors

6. Discussion and conclusion

This chapter discuss and concludes the study's result and suggest further research.

6.1 Discussion

As of our first research question none of the companies followed the defined Scrum by Schwaber and Sutherland (2017). It was rather the teams that had their own take on Scrum, with the Manager or Scrum Master as the decision-making body to how they would follow Scrum, because they had experience in Scrum, not only in knowledge but also with previous experience in the roles as Schwaber and Sutherland (2017) describes. We also understand that applying a new workflow do not happen overnight, it takes time to adjust and adapt to a new way of thinking for the teams. We believe that sometime during this adaption of Scrum, the teams found a balance between their workflow and Scrum, which worked for the teams. Therefore, it stayed that way, still having their way of working with parts of Scrum implemented. We saw that the teams rather approached an agile way of thinking, instead of working in Scrum. But during the study we found that Company Z had the approach that would resemble Scrum the most.

The biggest concern we found in the teams was that they were short-staffed. We understand this is a problem as well, due to their reality is more complex than the real reality. We consider it difficult to just follow what a document may say. To solve this problem one has to hire more people with the relevant competence. In doing this it will take time to find the right fit as it is time consuming.

The common factors for adjustments in the teams could be found in most of the teams. We believe that this is due to the fact that the teams already had resources that could resemble the Scrum-elements. For instance, the teams might already conduct morning meetings, which they just changed the name to Daily Standups. These changes would only be minor and could be applied instantly, while other changes might be major, and would then take time to adapt to.

As software development looked the same in all the teams, where the specifications come from the client to the Developers to develop and then to the Tester to test the software, and then to the Developers again to handle bugs. We found it like this in all the teams, which is why we believe that all the teams had as many common factors to the adjustment in Scrum as they had.

Another factor that we believe the cause for adjustment Scrum is what the companies develop. Company X was developing both hardware and software, as the software were going to be applied to the hardware in the finished product. Company Y and Z on the other hand developed software for systems and web, not producing any hardware. We believe that the process in a project would differ when working with both hardware and software contrary to solely working with software.

We also found that the method used in this study is suitable for this kind of research, keeping in mind the limited time frame, as it was easiest for us to use a multiple case study, due the method's characteristics of distinguish the cases. This would make it easier for us to compare the cases, and to see what deviated from each case. We believe that interviews as a technique was the most appropriate technique, because it was the easiest way of collecting data. In solely relying on questionnaires for example, we were afraid of not getting enough answers. Questionnaires will also only recognize the answers, interviews on the other hand will recognize the thoughts and expressions behind the answer. The interviews also gave us the chance to confirm if the interviewee understood the question correctly, because we found out that some answers were misinterpreted in the questionnaire and had to be changed. The downside with interviews though, is that the answers

from the interviewees are only reflecting their reality, how they experience Scrum. This might not reflect how it really is, that is why we used data triangulation, to confirm what is said by other parties.

Keeping in mind that it was the Manager or the coordinator in the company that chose the interviewees for us, the result can be biased. For they might have chosen these interviewees to only reflect the good sides of respective company. What we could of have done instead is to send out the questionnaires to all the Scrum-teams in respective company. Based on the answers we could have chosen which candidate was suited best for this research.

We also understand that the analysis does not follow a clear structure. For instance, the analysis emphasizes on the roles of the company, while analyzation of Company Y is more about the management structure. This is done deliberately, for we reckon that these are the most interesting parts of the deviations of Scrum from each company.

6.2 Conclusion

Conclusively, the reason for the teams not conducting pure Scrum was because it could not be implemented directly in the context of the Scrum-teams. They could not apply all the Scrum-elements defined by Schwaber and Sutherland (2017), even though Schwaber and Sutherland (2017) states that Scrum can be applied into any workflow or project. Scrum is described as a flexible method, but not as flexible as we thought from this study. The results from the research proves that the reality is much more complex regarding how Scrum is described and how it is supposed to be conducted. It rather feels like it is the agile way of thinking that attracts the companies, not the method Scrum.

One downside of the research was that we did fail on the triangulation in Company Z. Unfortunately, the Development Team Members was not represented in each Scrum-team. This was something we did not know before the interviews started and could have been prevented with additional interviews.

We want to address that this study is limited as it is conducted on three companies. We do not consider this as a systematic analysis, but rather a piece of puzzle of something bigger. This means that we do not want to put everyone under the one roof. We think that if we were to include more companies, a systematic analysis could be done. Putting together pieces of information to understand the whole truth of an object that is. We reckon that we achieved a deeper understanding of the studied area, but it is not enough to understand the bigger picture.

The purpose of this study was to contribute to a deeper understanding about how Scrum-teams are working with Scrum within the companies. Based on the result, we consider the purpose of the research is achieved. According to our results Scrum cannot be applied directly in any given project, but rather adjusted to fit the company's projects. The companies adapting to Scrum proved that Schwaber and Sutherlands (2017) definition of Scrum did not fit.

6.3 Further research

It would be of interest to approach the Scrum-teams differently to get a deeper understanding of how they are working with Scrum. To achieve this observation could be done. This could lead to findings of additional factors and why Scrum are adjusted. As the interviews are reflected by the interviewee's reality, it might not be the true reality, only how they experience it. Even though data triangulation is used for unbiased answers, one could instead use observer triangulation.

Observer triangulation has it meaning in observing the workplace by more than one researcher. This will be time consuming, but the data will accurate. To achieve a more statistically generalizable result one could include more levels, than the three levels in this research study. Another point of view that could be interesting is to see, is if Scrum differs depending on what field of practice the company are working within.

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Appendices

Appendix 1. Questionnaires

Appendix 1 consists of the questionnaires used in this research for gathering metadata on each level.

1A. Managers

1. What is your current position in the company?

2. How long have you been working with your current position?

3. What is your educational background?

4. How many teams are you in charge of?

5. Do you have any experience in Scrum, how many years?

6. Do you have a Scrum standard?

7. Is Scrum the most common agile method in your company?

8. If the answer to the previous question is no, describe which agile method is the most common in your company.

1B. Scrum Master

1. What is your current position in the company?

2. How long have you been working in your current position?

3. What is your educational background?

4. Do you have a Scrum Master certificate or similar?

5. How many Scrum-teams have you managed before?

6. Have you had any other position in a Scrum-team?

7. Are you currently using Scrum?

8. If you are working with a Hybrid of Scrum, what agile method do you combine?

9. Which of these Scrum events are you currently using?

- Sprint
- Sprint Retrospective
- Backlog Grooming
- Sprint Review
- Daily Standup

1C. Development Team Members

1. What is your current position in the company?

2. How long have you been working in your current position?

3. What is your educational background?

4. Have you worked in a Scrum-team before?

5. How long have you been working with the agile method Scrum?

6. Have you had any other position in a Scrum-team?

7. Have you worked with other agile methods besides Scrum?

8. Which agile method do you favor the most?

Appendix 2. Interviews

Appendix 2 introduces the interview questions conducted in this research. The empirics gathered are the building blocks in this study and will be presented in *Appendix 3*. All the interviews were conducted in Swedish. The following appendices has been translated from Swedish to English by the authors.

2A. Managers

1. Tell us about your role.

2. According to the questionnaire, there is an existing Scrum Standard/no Scrum Standard, how come?

3. Tell us about your Scrum Standard.

   b. Who is in charge of how you work with Scrum?
      (Asked if there is no Scrum Standard)

   c. Do all the teams follow this standard?
      (Asked if there is a Scrum Standard)

4. How is the collaboration between you, Scrum Master and Scrum-team?

5. What is the Scrum Master's main tasks?

6. What is the Product Owner's main tasks?

7. What is the Development Team Member's main tasks?

8. Are the roles within the Scrum-team combined?

9. Do you combine other agile methods?

2B. Scrum Master

1. Tell us about your role as a Scrum Master.

2. Is your role as Scrum Master combined?

3. Do you have a Scrum standard?

   3b. Do you work according to your own Scrum Standard?
   (Asked if there is no Scrum Standard)

4. Does Scrum differ depending of what kind of project you are working with?

5. Have you ever cancelled a Sprint?

6. Does all the Scrum-teams follow the same Scrum Standard?

7. To what extent are the Development Team Members independent?

8. How is the collaboration with the Development Team Members?

9. How is the collaboration with the Product Owner?

10. Is Scrum combined with other agile method?

2C. Development Team Members

1. Describe your role.

2. What kind of project are you working on right now?

3. Describe how you work with Scrum.

4. Has the approach to Scrum always looked like this?

5. Have you worked with a team that deviates from the Scrum Standard?
(Asked if there is a Scrum Standard)

6. To what extent is the Scrum-team independent?

7. How is the collaboration between the Development Team Members and Scrum Master?

8. How is the collaboration between the Development Team Members and Product Owner?

Appendix 3. Interview answers

The following appendix presents the answers from the interviewees. The interviews were conducted in Swedish and are translated into English by the authors. Please note that the following is not a transcript. The information presented is what the authors think is relevant to the question, leaving out parts that would have been redundant and considered useless to this study. Nothing is added than what the interviewees has said.

Company X

Manager

AQ1.   Tell us about your role.
I have a versatile role, for example, I am responsible for deliveries. These deliveries include Bluetooth and communication stacks which can be found in 60 million vehicles. I am managing one team in Sweden, where we are 25 people, and also 2 teams in Polen. Beside managing, my role focuses on sales.

Before I got hired as a Manager, I worked as a Scrum Master. My role as a Scrum Master meant that I stepped in and out from different projects, but this was based on the impediments the Scrum-teams faced. Some needed Scrum-teams needed more help than others.

AQ2.   According to the questionnaire, there is an existing Scrum Standard/no Scrum Standard, what's the reason?
I believe that Scrum needs to be adjusted, that is why we are not following Scrum to the fullest. The reality is more complex, and one cannot simply just implement Scrum as it is, therefore it has to be adjusted to fit the current project. This is the reason we do not a have Scrum standard.

AQ3.   Tell us about your Scrum Standard.
Not applicable.

AQ3B. Who is in charge of how you work with Scrum? (Asked if there is no Scrum Standard)
It all depends on the delivery and the process. Scrum needs to be flexible and must fulfill the framework onto the next framework. You need to follow certain steps in the process of our development and delivery.

AQ3C. Do all the teams follow this standard? (Asked if there is a Scrum Standard)
All the Scrum-teams have their own approach to Scrum, in which they follow.

AQ4.   How is the collaboration between you, Scrum Master and the Scrum-team?
The collaboration between us is somewhat vague, some of us has divided responsibilities. For instance, we do not have a Product Owner. The responsibilities of a Product Owner are divided between me and the Scrum Master. The Scrum Master also includes the responsibilities of an Architect in the Scrum-team.

AQ5.   What is the Scrum Master's main tasks?

The Scrum Master should follow the leadership philosophy, servant leadership. One should always know what to do in any given scenario and have an eye on the horizon. This also includes removing impediments.

AQ6.   What are the Product Owners main tasks?

Not applicable.

AQ7.   What is the Development Team Members main tasks?

Develop the product.

AQ8.   Are the roles within the Scrum-team combined?

Yes, as I previously stated, the Scrum Master has the workload of a Product Owner as well as Architect. This is because the responsibilities of a Scrum Master is not extensive enough. We combine roles because we went from a big Scrum-team to a smaller.

AQ9.   Do you combine other agile methods?

We have also included Kanban into our workflow. We made this possible by only picking the Scrum elements that worked for us and combined these Scrum elements with Kanban. This is because, according to my experience, Scrum does not cope as good as Kanban with maintenance projects. Nor does Scrum cope well with our framework. Kanban also allows us to deal with bugs more efficient than Scrum, because Scrum does not allow additional tasks into the Sprint. The bug fixes then have to dealt with in the next Sprint.

Scrum Master

AQ1.   Tell us about your role as a Scrum Master?
I am the glue between the client and the Scrum-team. I meet the clients and discuss their specifications, then mediates the specification to the Scrum-team for them to develop. I would say I am rather a Project leader than a Scrum Master. My role is combination of a Scrum Master and a Product Owner.

In the beginning I had my focus on the Scrum-team, how they work internally. But this gradually changed into a client focus. This was due to the client's dissatisfaction. The Scrum-team did a great work of developing the product, but the product was not according to the client's desires. I then realized that my focus should be on the client instead of the Scrum-team.

AQ2.   Are your role as Scrum Master combined?
Besides my responsibilities of a Product Owner and Architect, I am also a Tester in the Scrum-team. This seemed natural to me because I worked as a Tester before.

AQ3.   Do you have a Scrum Standard?
We do not have a Scrum standard. It looks different depending on where you work for example, our colleagues in Stockholm has a different approach to Scrum than we have. The same goes with the roles included in a Scrum-team. In our Scrum-team we define; System architect, developer, Scrum Master and UX-designer.

When we receive the client's specification, a lot of times, it can be pretty vague. This gives the Scrum-team freedom to develop the product as they wish. Nonetheless, the Scrum-team has to follow the Product Backlog, and the Product Backlog is determined by the client's specifications. But ultimately, it is me that decides the priority in the Product Backlog.

We do not have any Sprints, but we have weekly meeting with the client to present what has been done during the week, which gives clients a chance to change something they are not pleased with. We call this a Pulse. Nor do we recognize any Sprint Review, instead we have part-release which resemble a Sprint Review. This part-release happens once a month where we present the done part of the product. We do not conduct any Sprint Retrospective either, but we have our own version of it. But this is not done regularly. We do not recognize any Daily Standups either, because we talk to each other whenever we need to. As of estimating work packages, we do not do this either. The development takes as much time as it needs to. It does not matter how much time something needs it will be done either way, that is why we do not estimate. To keep a high degree of transparency in the Scrum-team, we use a Scrum-board. This tells us what is done and what needs to be done.

AQ3B. Do you work according to your own Scrum Standard?
        (Asked if there is no Scrum Standard)
        No.

AQ4.   Does Scrum differ depending on what kind of project you are working with?
No, it does not differ. The approach to Scrum is the same, whenever we work with development or maintenance.

AQ5.   Have you ever cancelled a Sprint?
No, we have never cancelled a Pulse, but instead we removed tasks from the Sprint Backlog to keep the Pulse on schedule.

AQ6.   Does all the Scrum-teams follow the same Scrum Standard?
No, all teams work with their own version of Scrum. If you do not adjust your way of working, you have not understood Scrum, you should always develop how you work. Along the road, it might not be Scrum anymore, but that is all right because it is about adapting to the situation.

AQ7.   To what extent are the Development Team Members independent?
I let the team be as independent as possible. The Scrum-team should be able to decide upon what to work on in the Sprint Backlog, because it is the Scrum-team that develops the product.

AQ8.   How is the collaboration with the Development Team Members?
I help them achieve the Pulse, remove impediments and steps in whenever the they need help with anything.

AQ9.   How is the collaboration with the Product Owner?
Not applicable.

AQ10.   Is Scrum combined with other agile method?
Our approach to Scrum is agile based with a fixed specification. We work with Scrum as far as the specification allows us to. But we will also include Kanban in some cases, like for instance during maintenance.

Development Team Member

**AQ1.	Describe your role.**
I am a consult where I develop software. My main responsibility is to develop new software, mostly towards web development and been working here for four years. In addition to developing, I also have some customer collaboration. Besides that, I do not combine my role.

**AQ2.	What kind of project are you working on right now?**
Right now we are developing new software which had been ongoing for one and a half year. When developing a new software, we in the Scrum-team can decide for ourselves how the work should be structured unlike when working with maintenance as the work is more controlled. I prefer to work with development, because this gives me more freedom regarding how to work.

**AQ3.	Describe how you work with Scrum.**
There is not much "Scrum work" right now. We have no Sprints instead we call them Pulses. We have two different Pulses, one weekly and one monthly. The weekly Pulses are weekly meetings where we review the work with customers. The monthly Pulses is where we present the done part of the product. We do not have Sprint Retrospectives either, because it feels to much for a small team. Nor do we conduct Daily Standups, because we have the weekly meetings where we meet and discuss the work. The reason for this is that we all sit in the same room which makes the communication easy. Adding a Daily Standup on top of that seems redundant.

We work in an agile way, but not as structured as how Scrum defines it. After every meeting with the customer, we sit down and discuss what needs to be done and how the work should proceed. As of Sprint Backlog, we do not use it, we only work with the Product Backlog, which we are in charge of. In the past when we worked with Sprints, the Sprints were two months. We got an appointed time where the product needed to be finished. If it was not finished by then, we still had to finish it, but without remuneration for the hours outside the appointed time. I feel like Scrum is an ideology, were we take the good parts and leave the bad ones out.

**AQ4.	Has the approach to Scrum always looked like this?**
No, I been working with Scrum before in different companies. No one has the same Scrum Standard. Scrum is bound to change for improvement.

**AQ5.	Have you worked with a team that deviates from the Scrum Standard? (Asked when the company have a Scrum Standard)**
Not applicable.

**AQ6.	To what extent are you independent within the Scrum-team?**
A lot of freedom is given to us developers. We are very independent in our work, because we are experienced Developers that are not in need of much guidance.

AQ7. **How is the collaboration with the Development Team Members and Scrum Master?**

The Scrum Master checks in on us once in a while to see how the work is proceeding. But most of the time he just lets us do our work.

AQ8. **How is the collaboration with the Development Team Members and Product Owner?**

We meet the Scrum Master every week to discuss the process of the work. This meeting is usually around 1 hour.

Company Y

Manager

AQ1.   **Tell us about your role.**
My role is the Head of Department; I am responsible for the software department. We have two departments, software and hardware. I have previous experience in a Scrum-team as Scrum Master, Product Owner and Developer.

AQ2.   **According to the questionnaire, there's an existing Scrum Standard/no Scrum Standard, how come?**
We do not have any Scrum Standard, but we work with ScrumBut. We strive to work with Scrum as far as possible, but we are short staffed, that is why we use ScrumBut. As we are short staffed, it has resulted in not having a Product Owner.

There some Scrum elements that we follow strictly and some that we can choose if we want to conduct or not. But there are some elements I want to see in a Sprint; Product Backlog, Daily Standups and Sprint Review.

AQ3.   **Tell us about your Scrum Standard.**
The two departments work very differently. The software department approaches Scrum in a higher degree than the hardware department. The hardware has more Scrumban (Scrum combined with Kanban) approach, because of the lack of Scrum experience within the hardware-department. Both the teams consist of a Scrum Master/Team Leader and Development Team Members with different specializations. The different roles are chosen based on Development Team Member's area of expertise. Both departments work with different Scrum standards because they are so different.

Both teams have Sprints which runs parallel with each other and because of this the teams have Sprint Reviews together. Present on the Sprint Reviews are stakeholders and internal clients. The internal stakeholders will also meet with both the teams to discuss the process. We have an open office landscape, so it is easy for the Scrum-team to start discussions with both the Scrum Master and Manager, hence no additional meetings.

AQ3B. Who is in charge of how you work with Scrum?
        (Asked if there is no Scrum Standard)
Not answered.

AQ3C. Does all the teams follow this standard?
        (Asked if there is a Scrum Standard)
Not applicable.

AQ4.   **How is the collaboration between you, Scrum Master and the Scrum-team?**
We usually meet up and decides how to go from there. The discussion consists of problems and solutions. Due to the open landscape, we do not feel the need to have many meetings.

AQ5.   What is the Scrum Master's main tasks?
The Scrum Master main task differ depending on what department the Scrum Master is working in, but in both cases the Scrum master should define the structure and the direction of where the project strives towards.

In the software department, the Scrum Master main tasks also includes develop software as well as being a System architect. The Scrum Master in the hardware department reports what is done here in Jönköping to the Chinese coworker, where we have a team of Developers. The Scrum Master then presents what is done in Jönköping and in China to different stakeholders.

AQ6.   What are the Product Owners main tasks?
As we defined no Product Owner, these responsibilities are combined by me, Scrum Master and the System Engineer. This is because we are short staffed.

However, the responsibilities of a Product Owner are to keep contact with the stakeholders during the Sprint. When contacting the stakeholders, they send us a specification. Based on this specification, we remake it into tasks, then send it back to the stakeholders for feedback.

AQ7.   What is the Development Team Members main tasks?
Develop the product.

AQ8.   Are the roles within the Scrum-team combined?
In the software department, both the Scrum Master and the Developers combines their roles. The Developers are responsible for testing their own code for instance. The reason for this that we want the Developers to produce code with good quality, but also, we lack Testers.

AQ9.   Do you combine other agile methods?
In some cases, Scrum are combined with Kanban. Kanban is used in the final stage of the project mostly for test purposes and handle the known bugs.

Scrum do not allow adding tasks into a Sprint, so whenever we encounter bugs, we cannot deal it until next Sprint. Kanban on the other hand, allows this. That is why we introduces Kanban into our workflow. When working Scrum, we use Sprints, but when working with Kanban we prioritize tasks.

Scrum Master YA

AQ1.   Tell us about your role as a Scrum Master.
I would not call myself a Scrum Master, but rather a Team leader. I am responsible for facilitating Scrum events, like Daily Standups and helps the Scrum-team to plan the Sprint. As of right now, I am in charge of one team.

AQ2.   Are your role as Scrum Master combined?
I share the responsibilities of a Product Owner with the manager, this shared workload includes the Product Grooming. Other than me and the manager sharing responsibilities, the Designers are also responsible for testing software. The reason why we share responsibilities is because are short staffed.

AQ3.   Do you have a Scrum Standard?
We do not have a Scrum Standard, and do not approach Scrum purely, but rather include parts of Scrum into our workflow. We in the software-team uses all of the Scrum events defined in Scrum, but one thing that defies Scrum is that our Daily Standup can take up to one hour. I think this is justifiable though, because the Scrum-team is already gathered, which is why I introduce deeper discussions during Daily Standups. But it is not mandatory for the whole Scrum-team to stay for the discussion, because it may not be relevant for everyone.

As of the Scrum events, we use all of them; Daily Standups, Sprint Planning, Sprint Retrospective, Product Backlog, Sprint Review. Our Sprint is usually two to three weeks, depending on how smooth the planning goes, but we also want to synchronize our Sprints with the hardware team. As far as estimations goes, me and the manager prepares a Sprint with a number of tasks which will be longer than a Sprint. Based on this, the Scrum-team will estimate how many tasks they can complete within the Sprint length. Within the Scrum-team we are six Development Team Members.

AQ3B. Do you work according to your own Scrum Standard?
      (Asked if there is no Scrum Standard)
We do not have an established Scrum standard. The Scrum approach looks different depending on what Scrum-team you are working in.

AQ4.   Does Scrum differ depending of what kind of project you are working with?
No.

AQ5.   Have you ever cancelled a Sprint?
Yes, once. There was an emergency and we had no other choice than cancel the Sprint.

AQ6.   Do all the teams follow the same Scrum Standard?
Not applicable.

AQ7.   To what extent are the Development Team Members independent?
We are very independent; we decide on how work with different tasks.

AQ8.   How is the collaboration with the Development Team Members?

I do the planning for the Development team.

AQ9.   How is the collaboration with the Product Owner?

Not applicable.

AQ10.   Is Scrum combined with other agile method?

We combine Scrum with Kanban. Kanban gives us the freedom of removing and adding things to the Sprint. I would say that we are working in a high degree of a Hybrid of Scrum.

Scrum Master YB

AQ1.   Tell us about your role as a Scrum Master.
I am not really a Scrum Master, but a Team leader for the hardware-department. My responsibilities include the roles of a Scrum Master, Product Owner and System engineer. As a System engineer, I am responsible for writing the specifications for both the software and hardware-department. As of the Product Owner, we have a different version of Product Owner than Scrum defines it. But as a Scrum-team we know what needs to be done, and therefore can go without a Product Owner.

AQ2.   Are your role as Scrum Master combined?
I do not consider my role as combined with other roles.

AQ3.   Do you have a Scrum Standard?
We do not have a Scrum standard, our approach to Scrum is taking parts of Scrum that we think fits our project and implementing those elements. For instance, we are currently using; Daily Standups, Sprints and Sprint Reviews. I think that the Daily Standups covers pretty much everything the Scrum-team needs to know, and therefore think that we do not need to conduct all the Scrum events. It would be too time consuming to conduct all the events. But we are also working next to each other, which invites discussion whenever it is needed.

The Scrum-team has specialized skills for the given role, meaning they are not multi-functional. In total, we are seven Development Team Members. Other than a Scrum Master, we do not have roles that are defined by Scrum. We will also put back any unfinished tasks in the end of the Sprint to the Product Backlog again, for the next Sprint.

AQ3B. Do you work according to your own Scrum Standard?
       (Asked if there is no Scrum Standard)
We try to follow Scrum as far as our projects allows us to.

AQ4.   Does Scrum differ depending of what kind of project you are working with?
No, it does not differ.

AQ5.   Have you ever cancelled a Sprint?
No, but we have added tasks to the Sprint.

AQ6.   Does all the teams you are in charge of following the same Scrum Standard?
Not applicable.

AQ7.   To what extent are the Development Team Members independent?
Everyone in the Scrum-team decides how to work, they are very independent. The Development Team Members are also in charge of the priority of the Product Backlog.

AQ8.   How is the collaboration with the Development Team Members?
As we are sitting next to each other, the collaboration is great.

AQ9.   How is the collaboration with the Product Owner?
My responsibility as a Product Owner only requires me to be present during the Sprint Review.

AQ10.   Is Scrum combined with other agile method?
We switch from Scrum to Kanban when the release is around the corner. I know from experience that changes needs to be done close to the releases, and Kanban allows these changes to be dealt with immediately. Scrum will not allow any more tasks in the current Sprint Backlog, meaning upcoming bugs will have to be handled in the next Sprint.

Kanban also lets you add tasks into the Product Backlog, which in the end can be unstructured, compared to Scrum which is more structured. Because of this I would say that we are working with a Hybrid of Scrum.

Development Team Member YA

AQ1.   Describe your role.
I develop the software for the products, but this is also done together within the Scrum-team; one can develop the software, while another one reviews the software. Tasks are distributed between the Developers in our Scrum-team.

AQ2.   What kind of project are you working on right now?
Right now we are developing new software.

AQ3.   Describe how you work with Scrum.
We do not follow a pure Scrum. Our Daily Standups for example can take up to one hour. But I prefer it this way because the whole team is already gathered, which I think is convenient for deeper discussions. The Sprints are three weeks and in the of the Sprint we conduct a Backlog Grooming to see which tasks that needs to be prioritized. Then in the beginning of the next Sprint we conduct a new Backlog Grooming to prioritize the current Sprint. But when it comes to the Sprint Retrospective and Sprint Review, we conduct them by the book. We also like to share the completed work, which is why we invite everyone who is involved in the project to the Sprint Review. We hope that this will attract potential clients.

During the period of development within a Sprint, we use Scrum. But in the end of the Sprint when the Sprint Review is closing in, we will then switch to Kanban.

AQ4.   Has the approach to Scrum always looked like this?
I do not know.

AQ5.   Have you worked with a team that deviates from the Scrum Standard? (Asked when Company have a Scrum Standard)
Not applicable.

AQ6.   To what extent is the Scrum-team independent?
The Product Backlog is shared within the Scrum-team. When it comes to choosing tasks, the specialists would choose the tasks that they are most confident about before any other tasks.

AQ7.   How is the collaboration with the Development Team Members and Scrum Master?
The Scrum Master is a part of our Scrum-team as a Developer. Other than that, he is the one that does the planning. He plans the Sprint, and we work accordingly.

AQ8.   How is the collaboration with the Development Team Members and Product Owner?
We are only in contact with the Product Owner during the Sprint Review, but he is always available for us.

Development Team Member YB

AQ1.   Describe your role.
My role in the Scrum-team is Technical lead. As a Technical Lead, I am in charge of the mechanical engineers in China, where we have other teams. But the interaction is not face to face, but rather digitally. It is also through digital communication where the Chinese are updated regarding what to develop.

AQ2.   What kind of project are you working on right now?
Developing new software.

AQ3.   Describe how you work with Scrum.
In my Scrum-team we are product developers and me as Technical lead. We have meetings with the whole team when we encounter impediments, meaning we do not have scheduled meetings. The Daily Standups do not happen regularly, due to the size of our Scrum-team. As of the Sprints, Sprints are two weeks, but we have been sloppy with the Sprints. There been times where we did not deliver what we supposed to during the two weeks. The Sprint Review on the other hand includes everyone in the project. But we all the teams have their own Product Backlog. We do not estimate working packages either, we just develop what needs to be done.

AQ4.   Has the approach to Scrum always looked like this?
I would say that there is a company Scrum standard, but this can only be implemented in the software department. My Scrum-team would just use the Scrum standard as a checklist.

AQ5.   Have you worked with a team that deviates from the Scrum Standard? (Asked when Company have a Scrum Standard)
Not applicable.

AQ6.   To what extent is the Scrum-team independent?
As the chinese coworkers are not present in Jönköping, it creates a lack of community. It means that they cannot really decide what to work on, so instead I prioritize their tasks and they work accordingly. But in the end, it is the System engineer that sets the specifications that we have to strive for.

AQ7.   How is the collaboration with the Development Team Members and Scrum Master?
The Scrum Master takes the Chinese coworker's thoughts into account and synchronizes the Chinese work with our work. Based on this he sets specifications that we have to follow.

AQ8.   How is the collaboration with the Development Team Members and Product Owner?
Not applicable.

Company Z

Manager

**AQ1.	Tell us about your role**
I am a Head of Unit, which includes tasks like recruitment, budget and wage for example. My role is a typical manager. I have a Scrum Master-certificate but have not been in a Scrum-team before.

**AQ2.	According to the questionnaire, there's an existing Scrum Standard/no Scrum Standard, how come?**
We not have a Scrum Standard, but instead we have an administration manual. This manual describes how the teams should work with development. The manual does not describe the framework Scrum, but parts of Scrum that the Scrum-teams uses, which can be identified as ScrumBut. This manual can be associated with a Scrum standard, for it is our way of working. The manual is not followed by all Scrum-teams though, because I manage Scrum-teams that also works with Kanban. I do not know where this manual originates from because it already existed when I started working here.

**AQ3.	Tell us about your Scrum Standard.**
Regarding the Scrum events, the Scrum-teams are using all of them, but all of them are not by the book. I only know how they work with Scrum as a whole, not in detail. The Daily Standups and Sprint Reviews are conducted by the book, while Sprint Planning, Product Backlog and Sprint Retrospective was done a bit differently, but I do not know how it deviates from Scrum. But the Sprint Planning and Product Backlog is done every other week.

AQ3B. Who is in charge of how you work with Scrum?
(Asked if there is no Scrum Standard)
It is the teams that decide how to work with Scrum.

AQ3C. Does all the teams follow this standard?
(Asked if there is a Scrum Standard)
Not applicable.

**AQ4.	How is the collaboration between you, Scrum Master and Scrum-team?**
I indirectly manage several teams, I manage the Scrum Master, which then manages the Scrum-team based on my requirements. But the Scrum-teams can always reach out to me, and I am responsible for what the Scrum-teams develop.

The Scrum Master acts like a bridge between me and the Scrum-team. This is due to large number of individuals in the Scrum-teams. It makes it much easier for me to have a messenger rather than talking to each individual Development Team Member.

**AQ5.	What is the Scrum Master's main tasks?**
The Scrum Master's is liable for the resource planning and competence planning together with me, meaning we plan for the resources and individuals needed to complete a project. Other than that, the Scrum Masters coordinates the projects, remove impediments and are a sounding board.

AQ6.   What are the Product Owners main tasks?

I do not manage any Product Owner, but instead we defined two other roles, Information Manager and System Administrator. The two roles have one common goal, to sync the clients and the Scrum-teams, getting everyone on the same page. To reach this goal the Information Manager and the System Administrator have different responsibilities. The Information Manager is liable for resources for future references while the System Administrator is in charge of the specifications, making sure that the specifications are followed.

AQ7.   What is the Development Team Members main tasks?

The Developers are in charge of developing. But they can state their minds about what they think is best for the project and based on that changes can be made. This is because it is the Developers that has the best insight of the project internally.

AQ8.   Are the roles within the Scrum-team combined?

Combinations of roles can apply depending on the client's specifications. For example, a specification that does not require a lot of software would mean that the project does not require the attention from four Developers but rather two Developers. The other Developers would then be assigned other responsibilities.

AQ9.   Do you combine other agile methods?

I do not know.

Scrum Master ZA

AQ1.   Tell us about your role as a Scrum Master.
The project I am in charge of includes three different teams where I am Team Leader for two of them. I have an administrative role to synchronize the other Team Leaders to decide what the Scrum-teams should do in the project. All the Scrum-teams are working with the same Product Backlog which make the synchronizing a bit harder.

As a Team Leader I facilitate meetings such as Daily Standups, Sprint planning and Sprint Retrospectives. I also coach the Scrum-teams and guide them to the right directions. But in the end, it is not me who is in charge, but rather the Scrum-team that had the last word.

AQ2.   Are your role as Scrum Master combined?
No.

AQ3.   Do you have a Scrum Standard?
We do not recognize any Scrum Standard, because of the size of the project. The estimation on the work packages is done by the Development Team Members where they estimate with story points. Each Development team member sets three to four story points per week. The story points define how difficult a working package is. They worked with three weeks Sprints. When we do not have Sprint Planning meetings, we instead have a Refinement meeting to discuss the Product Backlog. This is to breakdown the work packages into the next Sprint.

Each day we have Daily Standup where we go through what was done yesterday, what we will do today and if someone faced any obstacles. Present in this meeting besides the Scrum-team is the Product Owner and people that deliver the requirements. Once per week on the Daily Standups we go through the Scrum-board, this is a requirement from both the Product Owner and the requirements people. This is because they have a hard time following the Daily Standups.

When a Sprint is done, each Scrum-team will proceed with their Retrospective to go through what went well and what could be better until the next sprint. After the Scrum-teams gone through their own Retrospective, they met with the other Scrum-teams to do a "Overall Retrospective". In this meeting, they discuss the tasks that affect the entire project and other topics related to the project. This is done to improve the communication, not just within the Scrum-team, but on a higher level of the project. In the end of the Sprint, they conduct a Sprint Review. This is a review of the Product Increment for the stakeholders, customers and Product Owner. The Scrum-teams also have what we call a "Mini demo". This is conducted on a Daily Standups if the Developers have something they wanted to present for the stakeholders.

The roles are not combined but are vaguely defined. The Developers are not allowed to test their own code, but towards the end of the Sprint they could help the Testers, as there are not many tasks that requires coding. Each Product Owner have their own area of responsibilities. They have the authority over the Product Backlog but as they are three, they need to synchronize. This leads to the Product Owners cannot take decisions on their own, but rather having a joint decision. The Scrum-team could work with one Product Owner, one Sprint and in the next Sprint they could work with another Product Owner. This makes it hard for the Product Owner to get an overall picture over the Sprint.

AQ3B. Do you work according to your own Scrum Standard?
   (Asked if there is no Scrum Standard)
Not applicable.

AQ4.   **Does Scrum differ depending of what kind of project you are working with?**
Yes, different project requires different approaches, but we try to follow Scrum as far as the projects allows us to.

AQ5.   **Have you ever cancelled a Sprint?**
No.

AQ6.   **Do all the teams follow the same Scrum Standard?**
It is the Scrum-team that decides how to work. As long as the output of the work is good enough it does not matter how they work. The Scrum events looks the same, but it could be executed in different ways. The dynamic in the Scrum-teams looks different as well.

AQ7.   **To what extent are the Development Team Members independent?**
They are independent in a way that they decide how to work.

AQ8.   **How is the collaboration with the Development Team Members?**
I facilitate the meetings such as Daily Standups, Sprint planning and Sprint Retrospectives, but also guides the Scrum-teams to the right directions.

AQ9.   **How is the collaboration with the Product Owner?**
Other than the Daily Standups, there is not much collaboration with the Product Owner.

AQ10.   **Are Scrum combined with other agile method?**
In this project we applied the LeSS (Large Scale Scrum) framework, which is a bigger version of Scrum. The LeSS frameworks allowed us to synchronize all the teams by having more meetings. For example, we divided the Sprint Planning meeting into two meetings, Sprint Planning one and two. In Sprint Planning one, the Team Leaders discuss what each Scrum-team should conduct. Sprint Planning two is about planning the Sprint.

Scrum Master ZB

AQ1.   Tell us about your role as a Scrum Master.
We do not call it Scrum Master; we call the role Team leader. As a Team leader I facilitate meetings, supports the Scrum-team and making sure they know what to do. It is a lot of planning to do, due to the fact that we are working several Product Backlog Scrum-teams.

AQ2.   Are your role as Scrum Master combined?
I only combine my role if anything needs to be done. It could be System Architect or Tester for example. But for the most part I am sounding board for the Scrum-team.

AQ3.   Do you have a Scrum Standard?
We have a Scrum standard; our interpretation of Scrum is documented as well as the responsibility for each role. The Scrum-team consists of a Team Leader, Developer, Tester, Test Leader, System Architect, Delivery Manager and Specification Analyst, in total we are ten members. These roles are the ones defined in our Scrum standard. No roles are combined, except for mine. As of the Scrum-events, there are some events that deviates from the defined Scrum. For instance, the Daily Standups are done like Scrum defines it, but the Specification Analyst is present to ease with removing impediments. The Specification Analyst is also involved in the Backlog Refinement which will help the Scrum-team understand what to conduct during next Sprint. The Sprint Planning on the other hand is done twice, first for the Scrum-team to know what needs to be done, and then for everyone involved in the project, due to the framework LeSS. This applies to the Sprint Retrospective as well. The Product Backlog is not shared between Scrum-teams, but rather the Scrum-teams have their own Product Backlog. I think it is too time consuming to have a shared Product Backlog. The estimation is done during the Product Refinement, by breaking down the tasks into smaller tasks. If tasks need to be re-estimated, this would be done in Sprint Planning.

AQ3B. Do you work according to your own Scrum Standard?
      (Asked if there is no Scrum Standard)
Not applicable.

AQ4.   Does Scrum differ depending of what kind of project you are working with?
No.

AQ5.   Have you ever cancelled a Sprint?
We have never cancelled a Sprint, but rather rescheduled a Sprint. We are synchronized with other Scrum-teams, meaning changes to one Sprint impacts the Sprints in the different Scrum-teams.

AQ6.   Does all the Scrum-teams follow the same Scrum Standard?
The Scrum-teams have different Scrum experience, therefore having different approaches to Scrum.

AQ7.   To what extent are the Development Team Members independent?
The Scrum-team is very independent. They decide how they want to solve tasks; all they have to do is follow a deadline. This is to ease the work for me.

AQ8.   How is the collaboration with the Development Team Members?
I help with the planning of the Sprint and manage the resources.

AQ9.   How is the collaboration with the Product Owner?
We have five Product Owners, but they are divided into two departments, three Product Owners in IT-Quality department and two Product Owners in Report Statistics department. The whole company is also divided into two parts, which is not connected with each other, hence numerous Product Owners to connect the whole organization. But the Scrum-team do not work for all of them, only one of the Product Owner.

The Scrum-team will also review the Product Backlog with the Product Owner, because the Product Owners do not really know how to be a Product Owner, which is why I help the Product Owner understand Scrum. But the contact between me and the Product Owner only exist during planning and the Sprint Reviews.

AQ10.   Are Scrum combined with other agile method?
We use both LeSS and Kanban.

Scrum Master ZC

AQ1.   Tell us about your role as a Scrum Master.
My roles are to coach the Scrum-team so they can reach the Sprint goal. I facilitate all of the meetings within the Scrum-team.

AQ2.   Are your role as Scrum Master combined?
I combine my role as a Team Leader with Specification Analyst and Tester.

AQ3.   Do you have a Scrum Standard?
We have a guidance manual on how to work but it is not specific to Scrum. The manual has not been updated for a while, so I feel it is not relevant. Every Scrum-team works towards their own definition of Scrum. The Scrum we are working with is an adjusted Scrum, and we try to follow it as much as possible. The Scrum-team is autonomous and decide for themselves how to work. The Scrum-team consist of six members, Developers, Testers and Team leader. We also combine the roles within the team, but do not define any Product Owner, instead we call them "Information Manager" but they are not part of the Scrum-team.

The Scrum-team work with two weeks Sprints, where they conduct four different Sprint Planning meeting on the same day. This is because they handle maintenance with four different customers. The whole Scrum-team is present at this meeting along with the System Administrator. During the meeting they review the recent Sprint as what went well and bad. It is conducted by the System Administrator presenting the requirements and the Development Team Members can ask questions. When the Development Team Members have understood the requirement, the tasks are then estimated. As we have four different customers, we have four Product Backlogs as well. After the System Administrators have presented the requirements, the Development Team Members then continues to review the requirements and discuss how to approach these requirements and if needed, conduct another estimation.

Each day we have a Daily Standup where we go through what we did yesterday and what we are doing today and if we encountered any obstacles. The Daily Standup is usually 15 minutes. During the Sprint we do not have any Backlog Grooming, for it is the System Administrators job to the handle the Product Backlog. But there could emerge new requirements that needs to be fixed during the Sprint. If so, the System Administrators presents the requirements and the Scrum-team decides when to do it. The Sprint Review is only held at the Sprint Planning meeting for the System administrators if there is something to show. As of the Sprint Retrospective, the Scrum-team knows each other so well, that they made a joint decision to exclude the Sprint Retrospective.

AQ3B. Do you work according to your own Scrum Standard?
(Asked if there is no Scrum Standard)
Not applicable.

AQ4.   Does Scrum differ depending of what kind of project you are working with?
Scrum looks different depending if you are working with development or maintenance. When working with development there is more people during meetings and more roles included.

AQ5.   Have you ever cancelled a Sprint?
No.

AQ6.   Do all the teams follow the same Scrum Standard?
All Scrum-teams are working agile, but Scrum looks different in different Scrum-teams.

AQ7.   To what extent are the Development Team Members independent?
The Development Team Members are independent and self-organized. The Scrum-team should be multi-functional, but it is hard to avoid specialists choosing tasks that they know best. The Scrum-team works with an old system that only two Development Team Members are accustomed to which can be a problem for the Scrum-team.

AQ8.   How is the collaboration with the Development Team Members?
I facilitate meetings and resource planning, but also makes sure that the Scrum-team achieved the Sprint.

AQ9.   How is the collaboration with the Product Owner?
I help the Product Owners with requirements.

AQ10.   Are Scrum combined with other agile method?
The Scrum-team combines Scrum with Kanban depending on the tasks. If there are smaller tasks then there is no need for Sprints, instead we have a separate board which we use if the Sprint Goal is reached before the Sprint has ended. The Development Team Members then picks tasks they want to solve.

Scrum Master ZD

AQ1.　　Tell us about your role as a Scrum Master.
I have been a Team Leader for two months. I am in charge of two teams where one of them is not using Scrum. The Scrum-team that is using Scrum works with maintenance. My main tasks are to facilitate the meetings we have within the Scrum-team.

AQ2.　　Are your role as Scrum Master combined?
No.

AQ3.　　Do you have a Scrum Standard?
We do not have a company Scrum standard, but our own Scrum standard. The Scrum-teams should be multi-functional, but they are not. The Scrum-team consist of five Developers, two Testers and me as Team Leader. Outside of the Scrum-team there are two Product Owners who works in two separate departments, hence two of them. We work with three weeks Sprints. In the beginning of each Sprint we start with a Sprint Planning meeting where we go through unfinished tasks from the previous Sprint. I will then calculate how much resources we have to our disposal, at the same time as the Development Team Members estimates the tasks, which is done by Fibonacci numbers. The numbers represent the complexity of the tasks. We will also conduct a Daily Standup which usually lasts for 15 minutes, where each person goes through yesterday's work and today's work and if someone faced any obstacles.

During the Sprint we have a Backlog Refinement. This includes the Specification Analytics, which presents new requirements that needs to be done. When this is done the Development Team Members re-estimate the Product Backlog. At the end of each Sprint a Sprint Review is held. Attending at the Sprint Review are customers, Product Owner, System Administrators and other stakeholders. The Scrum-team presents what they have done during the Sprint and show the finished Product Increment. After the Sprint Review we have two Retrospectives. One is conducted every six weeks where only the Scrum-teams are present. The other one is done every week, where everyone included in the project attends.

AQ3B. Do you work according to your own Scrum Standard?
(Asked if there is no Scrum Standard)
Not applicable.

AQ4.　　Does Scrum differ depending of what kind of project you are working with?
Different projects need different adjustments. The company have guidelines on how to work but it is more like a toolbox.

AQ5.　　Have you ever cancelled a Sprint?
We have never cancelled a Sprint, but we had to redo a Sprint because of new requirements.

AQ6.　　Does all the teams you are in charge of following the same Scrum Standard?
No.

AQ7.   To what extent are the Development Team Members independent?
The Development team members are self-organized and decides how to approach the tasks.

AQ8.   How is the collaboration with the Development Team Members?
I am the bridge between the Development team members different stakeholders, guiding the Scrum-team towards the right direction.

AQ9.   How is the collaboration with the Product Owner?
The Product Owner is present during the Sprint Reviews and Sprint planning meetings. It is here he discusses requirements during the Sprints.

AQ10.   Are Scrum combined with other agile method?
No.

Scrum Master ZE

AQ1.   Tell us about your role as a Scrum Master.
My role as a Team Leader is to help everyone in the Scrum-team to understand Scrum, remove impediments and facilitate meetings.

AQ2.   Are your role as Scrum Master combined?
Besides the role as Team Leader, I do not combine any other roles or responsibilities. The Scrum Master and the Team Leader should not be the same person though, but the company is short-staffed and cannot separate these roles.

AQ3.   Do you have a Scrum Standard?
We have a Scrum Standard. I want to keep Scrum in its purest form, and if a Scrum-team do not follow Scrum as it is defined, I would change it so that the Scrum-team would work purely in Scrum. Everyone in my Scrum-team is multi-functional to some extent. The reason for everyone not being multi-functional is because the Testers do not develop any software. Other from the Tester not being multi-functional, the Scrum-team recognized all the roles in a Scrum-team; Product Owner, Scrum Master and Development Team.

We conduct all the Scrum events by the book. Parallel with my Scrum-team, we have a so-called Specification Team, which is a team that is in charge of the specifications for the project. In this team, the System Architect is included. I am in charge of one Scum-team, consisting of four Developers, one Tester, one Scrum Master and one Trainee. In total we are seven in my Scrum-team.

The Sprints are two weeks, while the estimations are based on story points set by Fibonacci numbers. It is the Development Team Members that set these story points. If tasks are not finished by the end of the Sprint, they would break down the tasks even further until next Sprint, so that they could finish in time.

AQ3B. Do you work according to your own Scrum Standard?
     (Asked if there is no Scrum Standard)
Not applicable.

AQ4.   Does Scrum differ depending of what kind of project you are working with?
Our workflow would in the logical order go from development to maintenance. The workflow would stay the same, regardless of our projects.

AQ5.   Have you ever cancelled a Sprint?
We have never cancelled a Sprint, for we always know what to be done.

AQ6.   Do all the teams follow the same Scrum Standard?
Not applicable.

AQ7.   To what extent are the Development Team Members independent?
They were very independent, and they could always ask anything to anyone, for they were all sitting together. This is an important aspect for the Scrum-team, according to me.

**AQ8.	How is the collaboration with the Development Team Members?**
I am a sounding board, facilitates the Scrum events and remove impediments.

**AQ9.	How is the collaboration with the Product Owner?**
I help the Product Owner to specify the requirements.

**AQ10.	Are Scrum combined with other agile method?**
No.

Scrum Master ZF (Product Owner)

AQ1.   Tell us about your role as a Scrum Master.
As a Product Owner I want to know the thoughts of my Scrum-team about their work. I want to get insight of the developed work. My main responsibilities are the developed product and keeping in touch with the stakeholders.

AQ2.   Are your role as Scrum Master combined?
Not applicable.

AQ3.   Do you have a Scrum Standard?
Team Leader is in charge of the Daily Standups and the Sprint Retrospective. How this is done are discussed between Team Leader and the Development Team Members. We are working with Scrum as far as possible, as long as one has the knowledge of Scrum, it could be very flexible. In the Scrum-team, one can find a Team Leader, one Tester, two System Architects, four Developers and one Product Owner. The Development Team Members are multi-functional but retain their roles.

During the Sprint Planning, the Scrum-team would review the Product Backlog to calculate what can be done during a Sprint, and this would take around two hours. The Backlog Refinement includes estimations of the tasks with points, and everything over three points are broken down to smaller tasks. This is done once per week and is done by the Development Team Members. But I am the one who decides upon the priorities of the Product Backlog.

Before conducting the Sprint Review though, I want a personal Sprint Review. This is for ensuring the client's desires. If I am happy, then the client is happy, for it is me that knows the client best. I considered that the Daily Standup are conducted by the book, as well as the Sprint Retrospective and Sprint Backlog. Regarding the Sprint Retrospective, I do not only want to know what could be better in the Sprint. I also want to know if anything else could be better, like if the light from the lamps was good enough for example. For I think that the wellbeing of the Developers would impact the product. If tasks are not finished by the end of the Sprint, the Scrum-team would break down the task to even smaller tasks.

AQ3B. Do you work according to your own Scrum Standard?
        (Asked if there is no Scrum Standard)
Not applicable.

AQ4.   Does Scrum differ depending of what kind of project you are working with?
The workflow of the project can look different from time to time, but only because they are dependent of other Scrum-teams. The Scrum standard could look different depending on the Scrum-teams, but ultimately, the foundation of Scrum looks the same.

AQ5.   Have you ever cancelled a Sprint?
We have never cancelled a Sprint, only reprioritized and re-estimated a Sprint, due to decisions by the board.

AQ6.   Does all the teams you are in charge of following the same Scrum Standard?
Not applicable.

AQ7.   To what extent are the Development Team Members independent?
The Scrum-team is very independent, they could work however they wish. I only cared about the finished product.

AQ8.   How is the collaboration with the Development Team Members?
The interaction between the Development Team Members and I occur mostly during the meetings. This is where they can discuss different topics regarding the project as well as me answering questions. These discussions would mainly take place during Sprint Planning and the Product Refinement. The reason being is because I do not want to disturb the Scrum-team while working, for I do not want the Scrum-team to feel like I am monitoring them while they are working. The Scrum-team could always reach out to me, but I would prefer that the Scrum-team would go through the Team Leader, so that the Team Leader could later answer to the me. I prefer it like this, so that the Team Leader also are updated for upcoming questions.

AQ9.   How is the collaboration with the Product Owner?
Not applicable.

AQ10.   Are Scrum combined with other agile method?
We combine two agile methods, because when unfinished tasks are moved over to the next Sprint, the Scrum-team would complete the tasks as they come. This is a continuous circle that would never end, and this is the springboard for combining Scrum and Kanban.

Development Team Members ZA

AQ1.   Describe your role.
I am a Tester with responsibilities to ensure that the software fulfills the requirements. But the requirements can be vague as it would vary depending on the project.

AQ2.   What kind of project are you working on right now?
Development.

AQ3.   Describe how you work with Scrum.
There are some deviations to Scrum, but the Daily Standup and Sprint Retrospective is conducted by the book, and the Sprint are three weeks. During the Sprint, the Backlog Grooming is conducted as well, but there have been times where we have dismissed it. We have a joint Sprint Review with all the Scrum-teams involved in the project, and sometimes also a "Mini-demo". A "Mini-demo" is conducted during the Daily Standups for the sake of Specification Analysts, for transparency reasons. We do not recognize any Sprint Backlog, but we are taking tasks from the Product Backlog and putting the tasks in the Sprints. But I do not consider this a Sprint Backlog. To estimate the tasks in the Sprint, we use Fibonacci numbers.

We have a common Product Backlog with all Scrum-teams involved in the project, but it is the Product Owner who is in charge of the Product Backlog. The Product Owner would later discuss the Product Backlog with the Scrum-team so that everyone would have the same understanding.

AQ4.   Has the approach to Scrum always looked like this?
Changes are continuous. For instance, we changed how we conducted Sprint Reviews and how we break down tasks. This is to optimize the workflow of the Scrum-team.

AQ5.   Have you worked with a team that deviates from the Scrum Standard?
        (Asked when Company have a Scrum Standard)
Not applicable.

AQ6.   To what extent is the Scrum-team independent?
We are very independent, we are managing our own work.

AQ7.   How is the collaboration with the Development Team Member and Scrum Master?
The Team Leader attends meetings on the behalf of the Scrum-team, and then debriefs the Scrum-team. This lets us in the Development Team Member have more time to develop and less time in meetings. The Team Leader also holds meetings if he is present, but he is not always present because he needed to connect with other Scrum-teams as well.

AQ8.   How is the collaboration with the Development Team Members and Product Owner?
The Product Owner is very busy, because he is a part of a group of Product Owner that manages another department. This means that we only meet the Product Owner during the morning meetings.

Development Team Members ZB

AQ1.   Describe your role.
My role is a Software developer where my main task is to develop new software. I do not combine my role with other responsibilities, but the assigned task can go beyond developing.

AQ2.   What kind of project are you working on right now?
The project I am working with right now is a new engineering project which is on the edge of maintenance.

AQ3.   Describe how you work with Scrum.
Our Scrum-team consist of one Team leader, three Testers, six Developers and four Product Owners. The roles within our Scrum-team are well defined, just like my role, the roles are not combined. It is the Team Leader that keeps track of the Scrum-team and suggests what we should do and helps us understand Scrum.

Before every Sprint we conduct a Sprint Planning meeting. We go through what we are going to do and what time allows us to. The whole Scrum-team attends this meeting and sometimes the Specification Analytics attends to present the requirements. The Development Team Members estimates tasks by using Fibonacci numbers, where the number are representing the complexity of a task. The Sprint is three weeks. Every day during the Sprint we have a Daily Standup, where we review yesterday's work and what we are going to do during the day. We also share obstacles, but do not discuss them during the Daily Standups. If we need any help, we will ask after the meeting. Sprint Refinement is done every other week depending on the Specification Analyst's request. If any request occurs, it is done every week. Towards the end of the Sprint, we present the work we have done in a Sprint Review. This is done every three weeks. Since the project includes many people, we split the Scrum-teams, so we present our work in separate rooms. Clients can then choose which Sprint Review that is the most interesting to them. When the Sprint is finished, we conduct a Sprint Retrospective.

AQ4.   Has the approach to Scrum always looked like this?
The underlying structure of how we work has always been the same. The Scrum events have always been the same but how we implement it has been different. For example, the Sprint Review has changed. We used to present the Product Increment for 80-100 people, including stakeholders. But the Scrum-teams thought it was difficult to present it in front of a crowd. Nor was there any discussion among the crowd. So, we changed it to how we are working today. From my own experience I considered that all the Scrum events are included, but they are carried out in different ways.

AQ5.   Have you worked with a Scrum-team that deviates from the Scrum Standard? (Asked when Company have a Scrum Standard)
Not applicable.

AQ6.   To what extent is the Scrum-team independent?
We are independent, we decide how we want to work. Since the Team Leader has other tasks, the responsibility lays in our hands.

AQ7.   How is the collaboration with the Development Team Member and Scrum Master?

The Team Leader is more of a support to us. She attends all the meetings but let the us do the work.

AQ8.   How is the collaboration with the Development Team Members and Product Owner?

The collaboration with the Product Owners is good. We have frequent contact with them if we have questions about the Product Backlog. If we have questions about requirements, we speak with the Specification Analysts.

Development Team Members ZC

AQ1.   Describe your role.
I am a Developer, but the tasks could differ, from database to backend and frontend. In my Scrum-team, we do not combine any roles. But before handing over my software, I will test it by myself first.

AQ2.   What kind of project are you working on right now?
The project I am a part of goes between development and maintenance.

AQ3.   Describe how you work with Scrum.
The Scrum-team consists of eight members. Seven of us are Developers with different orientations and one Team Leader. I do not know if we have a Product Owner, because we work with a lot of different systems. Different systems have different Product Managers. We have two-week Sprints, where we have four different clients. This means that we have four different Sprint Planning meetings on the same day. Before this meeting the System Administrators creates tasks that needs to be done and prioritize them in the Product Backlog. During this time the Scrum-team discuss what we did last Sprint and what we did not do, then we estimate the tasks. Every day during the Sprint we conduct a Daily Standups by the book, and if needed the Systems Administrators attends the Daily Standups to give us new requirements, but only if something needs to be done immediately. We had no Backlog Refinement meeting during the Sprint. Sprint Review is only conducted if we have anything to present.

AQ4.   Has the approach to Scrum always looked like this?
Scrum looks different depending on how the Scrum-team is composed, like how long the Sprints are for instance.

AQ5.   Have you worked with a Scrum-team that deviates from the Scrum Standard? (Asked when Company have a Scrum Standard)

Not applicable.

AQ6.   To what extent is the Scrum-team independent?
We are independent in choosing which tasks we want to conduct, but it is the System Administrators that chooses which tasks we will work with and decides upon the Product Backlog.

AQ7.   How is the collaboration with the Development Team Members and Scrum Master?
The Team Leader keeps track of everything we do. He removes impediments and makes sure that the workflow goes smoothly.

AQ8.   How is the collaboration with the Development Team Members and Product Owner?
The Product Owner is only present during meetings.

Development Team Members ZD

AQ1.   Describe your role.
My role is a Software developer where the tasks are to deliver new software. As a Developer I do not combine any other roles within the Scrum-team, but when it is needed, I help the Testers to test the software. It all comes down to finish the Sprint, so if help is needed, I will provide it.

AQ2.   What kind of project are you working on right now?
The project I am currently working with is mostly maintenance and some new development. The system we are working with is never finished so it is always new implementation that needs to be done.

AQ3.   Describe how you work with Scrum.
Our Scrum-team consist of one Team Leader, two Testers and four Developers. We have a defined Team Leader role, but if the Team Leader is not present, any of the Development Team Members steps in and takes his role. In addition to these roles we have two Product Owners. The reason for having two is because each Product Owner is responsible for different systems on different departments.

We work with three-week Sprints. We used to work with two-week Sprints but as the Scrum-team got smaller, it was hard for us to finish the Sprints. The meetings took too much time and left us with less time to finish the tasks. Before every Sprint we have a Sprint Planning. During this meeting, we moved the unfinished tasks to the next Sprint, to later estimate all the tasks which are in the Product Backlog. It is also the Development Team Members that are in charge of the estimation. The estimated tasks are then moved into the Sprint Backlog. Each week we have Backlog Refinement, where the Specification Analyst browse the Sprint Backlog and the Development Team Members breaks down the tasks. If anything has been changed, re-estimating tasks will also be conducted during the Backlog Refinement. The Scrum-team conducts Daily Standups every day by the book, where we go through the Sprint Backlog. It is the Team Leader that facilitate this meeting.

Depending on what we have done during the Sprint, the Sprint Review looks different. If there is an implementation that is not going to be visualized, we just talk about it otherwise we present it. Attending this meeting is the System Administrators, Product Owner and other users. When the Sprint is coming to an end, we have a Sprint Retrospective with the people involved in the project.

AQ4.   Has the approach to Scrum always looked like this?
How we approach Scrum has been different. The Sprint Reviews for example, have not always been conducted. When I was new in the Scrum-team the Product Increment was handed to the Specification Analyst. The Specification Analyst would later approve or disapprove. The Testers in the Scrum-team would not attend the Sprint Planning meetings either. All this have changed, changed to resemble Scrum.

AQ5.   Have you worked with a Scrum-team that deviates from the Scrum Standard? (Asked when Company have a Scrum Standard)
Not applicable.

AQ6. **To what extent is the Scrum-team independent?**

The Development Team Members are independent. We try to be as multi-functional as possible but depending on the situation we choose tasks that they feel comfortable with.

AQ7. **How is the collaboration with the Development Team Members and Scrum Master?**

The contact with the Team Leader occurs daily for the Team Leader sits next to the Scrum-team.

AQ8. **How is the collaboration with the Development Team Members and Product Owner?**

We usually meet the Product Owner at meetings, but we can also reach out to him whenever we have any questions.

Development Team Members ZF

**AQ1.	Describe your role.**
I work as a Tester, where I test the software.

**AQ2.	What kind of project are you working on right now?**
Mainly development, but there are some maintenance tasks.

**AQ3.	Describe how you work with Scrum.**
The roles in my Scrum-team is by the book; Scrum Master, Product Owner and Developer team. There are three Developers, one Tester, one Scrum Master and one Product Owner. My Scrum-team do not combine any roles, and we also have a Scrum standard. We are also a part of a bigger project.

We have five Scrum events that we conduct; Sprint Planning, Sprint Retrospective, Backlog Grooming, Sprint Review and Daily Standups. In our Sprint Planning we are estimating the Product Backlog and the Sprint. The Sprint is three weeks. This is based on the prioritized Product Backlog by the Product Owner. We used to have two-week Sprints, but changed it to three weeks, because two weeks was too short of time. As my Scrum-team is one of many Scrum-teams in the same project. The reason for this is that the Scrum-teams do not have their own Product Backlog, but rather a shared Product Backlog between the Scrum-teams in the project. When estimating the Sprint, it is the Developers and the Tester that does this with Planning Poker.

The Daily Standups are done by the book with a digital Scrum-board. During the Daily Standups, the Product Owner is also present to answer questions. As of the Sprint Backlog, I do not recognize this. Instead, we take tasks from the Product Backlog into the Sprint. Unfinished tasks by the end of the Sprint are moved to the next Sprint. When conducting the Sprint Review, all the Scrum-teams in the project have a joint Sprint Review, puzzling the pieces together and then displaying the Product Increment. As there are many Scrum-teams involved in one project, all of the Scrum-teams have respectively meeting on the same day. This is due to the framework LeSS that is conducted across all the Scrum-teams in the project. As of the Backlog Grooming, it is conducted once a week.

**AQ4.	Has the approach to Scrum always looked like this?**
Yes.

**AQ5.	Have you worked with a Scrum-team that deviates from the Scrum Standard? (Asked when Company have a Scrum Standard)**
Not applicable.

**AQ6.	To what extent is the Scrum-team independent?**
We are only restricted by the priorities in the Product Backlog.

**AQ7.	How is the collaboration with the Development Team Members and Scrum Master?**
The Team Leader facilitate the Scrum events and plan the Sprint.

AQ8.   How is the collaboration with the Development Team Members and Product Owner?

The Product Owner is in charge of the Product Backlog and is present in some meetings.

Development Team Members ZG

AQ1. Describe your role.
I work as a Software developer. I am in charge of the techniques used by the Scrum-team during development. Whenever the Team Leader is absent, it is me that steps in.

AQ2. What kind of project are you working on right now?
The project I am a part of now works with development.

AQ3. Describe how you work with Scrum.
In our Scrum-team we are; five Developers, two Testers and one Team Leader. In some cases, the Team Leader helps with testing when it is needed. We work with three-week Sprints, and before each Sprint we have two separate Sprint Planning meetings, Sprint Planning one and Sprint Planning two. Sprint Planning one is a part of the LeSS framework. During the Sprint Planning one, the Specification Analysts and relevant people who works with requirements are present. Together they prioritize each tasks and sort them in the Product Backlog. In Sprint Planning two the Scrum-team retrieves the prioritized Product Backlog and estimate each task. The estimation is done in different steps depending on the urgency of each task. If tasks are not completed within the Sprint, they are moved over to the next Sprint. We do not have a Backlog Grooming, but something that resembles a Backlog Grooming is conducted in Sprint Planning one.

Each day the Scrum-team together with other external stakeholders and Specification Analyst have a Daily Standups. Each participant will go through what they achieved yesterday and what they will do today as well as presenting obstacles. At the end of each Sprint the Sprint Review is held, where the whole project is presented to customers and stakeholders. To conclude the Sprint, we conduct a Sprint Retrospective.

AQ4. Has the approach to Scrum always looked like this?
During my time at this company, the way of working with Scrum has changed. Recently we have added the framework LeSS because of the size of the project, which involves multiple teams.

AQ5. Have you worked with a Scrum-team that deviates from the Scrum Standard? (Asked when Company have a Scrum Standard)
Not applicable.

AQ6. To what extent is the Scrum-team independent?
The Development team members are self-organized. We decide how the work should be carried out. We are responsible for the Sprint to succeed.

AQ7. How is the collaboration with the Development Team Member and Scrum Master?
The Team Leader is not that involved in the Scrum-team. This is because all of the Team Leaders in the different Scrum-teams has to synchronize with each other. The collaboration with Team Leader happens mostly in the planning phase of the Sprint.

AQ8. **How is the collaboration with the Development Team Member and Product Owner?**

The Product Owner's collaborates with us in different workshops which the Specification Analyst facilitate. The Product Owners are not a pure Product Owner, they stand somewhere between Specification Analyst and other Stakeholders. The Product Owners achieved these roles, because they know how the product works.