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Agile Framework for Information Technology Service Management

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ABSTRACT:
Companies are recognizing Information Technology Service Management (ITSM) as a key improvement target and as a strategic tool to survive in competition in the IT industry. At the same time Agile methodologies are becoming more and more popular in the IT industry. The Information Technology Infrastructure Library (ITIL) framework provides a structured approach to tackle challenges and to be successful in ITSM. IT companies are facing a lot of changes and Agile software development methods are helping with that challenge. Agile methods are widely known and used over the world and one of the most popular Agile methodologies is the Scrum framework.

The first objective of this master´s thesis is to describe how ITIL, ITSM best practices can be combined with Scrum to be able to create framework for Agile IT service management. The second objective is to research what Agile features companies have added as part of service management and to research experienced the benefits and challenges experienced when combining Agile methods with IT service management.

ITSM, ITIL and Agile ideology including the Agile framework Scrum, are presented first in the literature review. Based on the literature review Scrum and ITIL frameworks are combined as a framework for Agile service management and this creates the theoretical framework for this Master´s thesis. The empirical part of the thesis is done by survey. The Population is service managers working in the IT industry in Finland and the sample size was 63 service managers and 59 of answers was approved. Survey results are described by presenting how Agile methodologies are combined with service management in practice and what kind of benefits and challenges respondents have been experienced.

Results show that it is possible to incorporate Agile methodologies as part of IT service management and, at more detailed level, as part of service lifecycle phases so as to fulfill the objectives of service lifecycles. The most common Agile features implemented as part of IT Service management were self-organized teams, the product owner role, the sprint backlog artifact and the daily scrum event. These were all implemented by 30 or more service teams in the sample of 59 service teams. Regarding benefits experienced, three topics arose clearly from survey responses, and those are transparency, sharing big work into smaller tasks and better communication. The following topics were the main challenges experienced: lack of focus on the customer, insufficient clarification of Agile methodologies for the team, customer and stakeholders and implementation of Scrum roles. Based on experienced benefits and challenges experienced 6 rules are created to support service managers to accomplish the benefits and avoid the challenges.

KEYWORDS: IT Service Management, ITSM, ITIL v.3, Agile Methods, SCRUM, Agile Service Management

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TIIVISTELMÄ:
Yritykset tunnistavat IT-palvelunhallinnan kehityskohteeksi ja strategiseksi työkaluksi, joka auttaa paljon kilpailulla IT-alalla. Samaan aikaan ketterät menetelmät nostavat suosiotaan IT-alalla. ITIL malli tarjoaa jäsennellyn menetelmän, jonka avulla yritykset voivat voittaa haasteita ja menestyä IT-palvelunhallinnassa. IT-yritykset kohtaavat paljon haasteita ja ketterän ohjelmistokehityksen metodit auttavat selviytymään näistä haasteita. Ketterät menetelmät ovat tunnettuja maailmanlaajuisesti ja yksi suosituimmista on Scrum.

Ensimmäinen tavoite tälle diplomityölle on kuvata miten ITIL eli IT-palvelunhallinnan parhaat käytännöt voidaan yhdistää Scrumin kanssa, jotta voidaan luoda malli ketterälle palvelunhallinnalle. Toinen tavoite työlle on selvittää mitä ketteriä ominaisuuksia yritykset ovat ottaneet osaksi palvelunhallintaa ja mitä hyötyjä ja haasteita yritykset ovat kokeneet liittyen ketterien menetelmien yhdistämiseen palvelunhallintaan.

Palvelunhallinta, ITIL, ketterä ideologia ja Scrum esitetään kirjallisuuskatsauksena ensimmäisenä tässä diplomityössä. Pohjautuen kirjallisuuskatsaukseen Scrum ja ITIL mallit yhdistetään malliksi ketterälle palvelunhallinnalle ja nämä muodostavat teorian tälle diplomityölle. Empiirinen osa on toteutettu kyselyllä. Tutkimuksen perusjoukko koostuu palvelupäälliköistä, jotka työskentelevät IT-alalla Suomessa ja tutkimukseen vastasi 63 palvelupäällikköä ja vastauksista hyväksyttiin 59. Tutkimustulokset on kuvattu esittämällä miten ketterät menetelmät yhdistetään palvelunhallintaan käytännössä ja mitä hyötyjä ja haittoja palvelupäälliköt ovat kokeneet.

Tutkimustulokset osoittavat, että ketterien menetelmien yhdistäminen palvelunhallintaan ja tarkemmin osaksi palvelun elinkaaren vaiheita on mahdollista. Ketterien menetelmien avulla voidaan tukea palvelun elinkaaren vaiheille asetettujen tavoitteiden täyttymistä. Suosituimmat ketterien menetelmien ominaisuudet, jotka oli otettu käyttöön osaksi palvelunhallintaa oli itseohjautuvat tiimit, palvelunomistaja rooli, sprintin tehtävälista ja päivittäisen Scrum tapaamiset. Nämä olivat käytössä 30 tai useammalla vastaajalla 59 vastauksesta. Koettuihin hyötyihin liittyen kolme aihetta korostui vastauksissa, läpinäkyvyys, työn jakaminen pienempiin tehtäviin ja parempi viestintä. Haasteiden osalta nousivat puute asiakkaan huomioimiseen, riittämätön selventäminen ketteristä menetelmistä tiimille, asiakkaalle ja sidosryhmille ja Scrum roolien käyttöönotto. Koettujen hyötyjen ja haittojen osalta on luotu kuusi sääntöä palvelupäälliköille, jotta voidaan saavuttaa hyödyt ja välttää haasteita.

AVAINSANAT: Palvelunhallinta, ITIL, Ketterät menetelmät, Scrum

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1 Introduction

1.1 Topic

More and more IT companies try to be agile but companies tend to concentrate on the technical side and software development practices. However service management aspects also need to be re-evaluated to be able to accomplish possibilities of being Agile in the service management field.

This master´s thesis is about best practices of Information Technology Service Management (ITSM) and how Agile methods can be combined with ITSM. The idea is to develop framework for companies for Agile ITSM.

1.2 Scope

The scope of the master´s thesis is to examine service management aspects of Agile methods and how Agile methods can develop service management. This thesis is mainly about services that already exist and the idea is to create service management framework, which is based on the Information Technology Infrastructure Library (ITIL) and combined with Agile methods, in particular Scrum. The main idea is to recognize how Agile best practices can be implemented in service management and what benefits and challenges there have been perceived compared to the traditional ITIL based service management framework. Based on challenges and benefits experienced this thesis presents rules for service managers to be able to succeed in Agile service management. This Master´s thesis does not research opinion or experiences of service team, customer or stakeholders. The master´s thesis is targeted mainly for service providers and can be used by internal and external IT service providers.

1.3 Methodology

Qualitative and quantitative studies are combined in this master´s thesis, and the data collection method is survey. More detailed information about the methodology used is given in chapter 5.

1.4 Research objective and questions

The main objective for this master´s thesis is to research how service management can be combined with Agile methods, what Agile features IT services have added as part of service management and what kind of experiences service management professionals had regarding implementing Agile roles, artifacts and events as part of service management.

Research questions and description of data source is described in table 1.

Research question	**Data source**
1. How to combine IT Service management with Agile methodologies?	Literature review
2. What Agile features IT service teams have added as part of traditional service management when moving towards agile service management?	Survey
3. What kind of benefits and challenges have been experienced when combining IT service management and agile methodologies?	Survey

Table 1. Research questions and data source.

Companies that have just started or are at the start of their journey towards agile service management can utilize results from this master´s thesis.

1.5 Structure of Master´s Thesis

The first chapter describes the Master´s thesis topic, scope, background, research objective and research questions of the master´s thesis.

The second and third chapters form theoretical framework for this Master´s thesis, including literature review of ITSM, ITIL, Agile methodologies and Scrum. The literature review describes the objectives, roles and main characteristics of both IT Service Management and Agile methodologies and ITIL and Scrum frameworks.

The fourth chapter is about creating framework for Agile service management based on the literature review. The fourth chapter answers the first research question and fourth chapter defines how IT service management and Agile methodologies can be combined.

The fifth chapter is about describing the methodologies for the research. It describes the population and sample. Fifth chapter describes how the survey was created and how data was analyzed. Also research reliability and validity are reviewed in this chapter.

The sixth chapter is about the results of the survey and it answers to research questions two and three. This chapter describes what agile features IT service teams have added as part of traditional service management when moving towards agile service management and what kind of benefits and challenges service managers have been experienced when combining IT service management and Agile methodologies. Based on the benefits and challenges experienced, six rules are created for service managers to be able to implement agile methodologies successfully.

The seventh chapter provides conclusions and discussion. This chapter present how results are linked to the earlier studies and estimates the generalizability and applicability of the results.

2 Information Technology Service Management

Information Technology Service management (ITSM) focuses on service delivery and service support. Many IT companies recognize ITSM as a key improvement target and see it as a strategic tool to survive in competition between IT companies. IT service providers need to focus on the quality of the services that they provide and on the relationship with their customers. ITSM can be described as a process-oriented approach for managing lT systems and it focuses on the delivery and support of quality IT services. ITSM covers management and maintenance of IT services. IT service is a combination of people, processes and technology, and IT services are based on the use of information technology and aim is to support the customer´s business processes. (Clacy & Jennings; Jäntti & Hotti 2016;Cronholm & Salomonson 2014; Galup et al. 2009.)

Conger et al. (2008) describe ITSM as focused on defining, managing and delivering IT services that support business goals and customer needs. Customers can be internal customers or external customers. Regarding ITSM it is important to understand two concepts: service and process. Conger et al. (2008) defines these in the following way “A service is some combination of IT resources – hardware, software, people and processes that deliver value to an organization”. Process is defined as “set of steps taken by participants in a work activity to accomplish same goal”.

Based on presented earlier descriptions of ITSM, it can be summarized that the goal for ITSM is to deliver and support quality IT services that support business goals and customers needs.

2.1 ITIL

The Information Technology Infrastructure Library (ITIL) is the most accepted and used framework for ITSM: however there exist also other frameworks. ITSM and ITIL are

even used sometimes incorrectly as synonyms in the literature, but it is important to understand the difference between them. ITSM can be seen as the concept and there are different frameworks to adopt for service management. Frameworks like ITIL provide terms and processes for ITSM (Iden & Eikebrokk 2013). The Information Technology Infrastructure Library (ITIL) is a framework of best practices from different organizations around the world. Best practices means that approach has provided itself to be effective in practice in a variety of IT organizations. The objective of ITIL is to deliver high quality IT Services. (Iden & Langeland 2010; Ahmad & Shamsudin 2013: 237-244; Bernard 2012.)

ITIL version 1 is from 1980. It was developed by the British public body, the Central Computer and Telecommunications Agency (CCTA). ITIL was not used widely until the mid 1990s, but ITIL version 2, that was published between 2000 and 2002, changed that, and after that it became widely used and as a standard for ITSM. ITIL version 3 presented a service lifecycle model for ITSM. ITIL has a process-based focus and ITIL version 3 described almost thirty processes describing tasks for IT suppliers. These processes are described in table 2. (Iden & Langeland 2010.) ITIL 4 is the newest ITIL version and it was launched at the end of year 2019. However, in this master´s thesis ITIL v3 is used as a reference. ITIL 4 has some updates compared to ITIL v3 regarding an end-to-end operating model to create, deliver and continually improve tech-enabled products and services. (Axelos 2019b.)

Service Strategy	**Service Design**	**Service transition**	**Service Operation**	**Continual Service Improvement**
Strategy management	Service catalogue management	Transition planning and support	Access management	Seven step improvement
Demand management	Availability management	Change management	Event management	
Service portfolio management	Information security management	Change evaluation	Service request fulfillment	
Financial management	Service level management	Release and deployment management	Incident management	
Business relationship management	Capacity management	Service asset and configuration management	Problem management	
	Design coordination	Service validation and testing		
	Supplier management	Knowledge management		
	IT service continuity			

Table 2. ITIL process areas (service lifecycle phases) and processes (ITIL Docs 2020).

ITIL describes the concept of ITSM as “the implementation and management of quality IT services that meet the needs of the business. IT service management is performed by IT service providers through an appropriate mix of people, process and information technology ” (Axelos 2019a).

In considering ITIL best practices, it is important to define the main concepts. Service means value creation to a customer and value is seen as a core of the service concept. ITIL defines service in the following way: ”Service is a means of delivering value to customers by facilitating outcomes customers want to achieve without ownership of specific costs and risks.” To clarify the concept of value, it can be simplified to two main

components, which are utility and warranty. Utility means the outcome that the customer receives and warranty means the way the outcome is provided from the service provider point of view. (Bernard 2012.)

ITIL describes service management by service lifecycle, which describes how service management components are linked. Service lifecycle and service stages are described in the figure 1. Service lifecycle phases can be also described as process areas that include 26 more detailed processes in ITIL v3. All Service lifecycle areas and processes of those process areas are presented in table 2. However this master´s thesis concentrates on service lifecycle phase objectives, not to single process objectives. The following chapters describe each phase of the service lifecycle more clearly and in more detail. The service lifecycle has five phases that are; Service strategy, Service Design, Service Transition, Service Operation and Continual Improvement. (Bernard 2012; ITIL Docs 2020.)

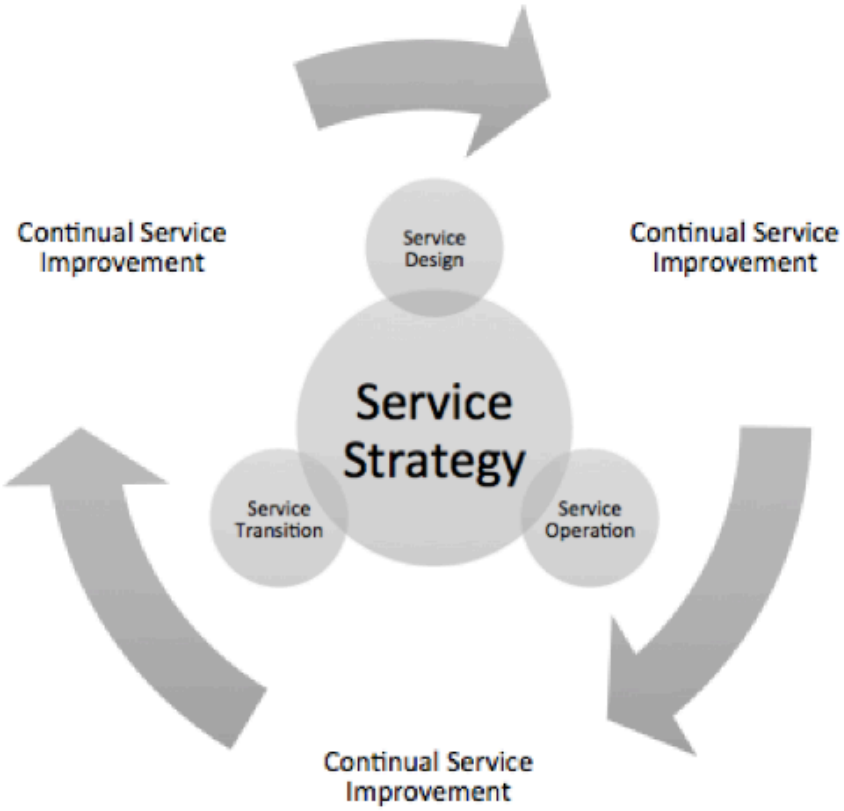

Figure 1. ITIL Service Lifecycle.

2.1.1 Service Strategy

The first stage of the service lifecycle that is described in ITIL V3 is service strategy. It defines from a business point of view the value of the service, and defines clearly policies and objectives for the service. Service strategy defines guidelines to create value and to achieve and maintain strategic advantage. The service strategy stage can be also described as the axis of service lifecycle and it combine all stages together. This stage helps to identify IT services that are needed and how services should be delivered. (Axelos 2019c.; Bernard 2012; Gërvalla et al.,2018.)

2.1.2 Service Design

The Service Design phase is the next phase. The objective for this stage is to design and develop service with a smooth build and effective operations, and this phase includes architecture, processes, systems and tools. Regarding IT service management, this phase includes the following things in order to achieve current and future requirements from a business point of view; policies, documents, measures and metrics. The service design phase ensures delivery of quality services and it has five objects: design of IT service offered, design of service management systems and tools, design of IT architectures and management systems and tools, design processes for installing, operating and improving IT services and processes and design of measurement methods and metrics. (Bernard 2012; Gërvalla et al.,2018.)

2.1.3 Service Transition

The third phase is all about planning and managing the implementation of services that were designed in the earlier stages. Services can be modified or totally new services put in place. In the Service Transition stage it is important to ensure that customer specifications are fulfilled. The Service transition phase helps to control and manage risk when a service is transitioned to a new operational level of service. This phase of-

fers processes (see table 2) to safe change management and helps to minimize the impact of changes to service delivery quality. (Bernard 2012; Gërvalla et al.,2018.)

2.1.4 Service Operation

The fourth phase is about ensuring value for the customer and for the service provider. In this phase it is important to manage and fulfill all activities to be able to provide and support services. The service operation phase concentrates on day-to-day operation of processes managing and on performance indicator gathering and reporting. (Bernard 2012 Gërvalla et al.,2018.)

2.1.5 Continual Service Improvement

The last phase is about improving and learning, This stage is all about analyzing earlier confusions and making improvement plans and projects to be able to improve effectivity and efficiency to meet business requirements. The continual service improvement phase is responsible for implementing IT service improvement that supports organizational goals. (Bernard 2012; Gërvalla et al.,2018.)

2.1.6 Roles

Within ITIL Information Technology Service management roles can be shared for the three different categories based on their responsibility: roles are responsible for the lifecycle of specific services, roles that are responsible for process management and execution, and roles that are responsible within certain processes and functions, these roles can be defined also as process practitioners. Roles and responsibilities are shown in Table 3. (Axelos 2019.):

Role	Description
Service Owner	Responsible for lifecycle of specific services
Service Manager	Responsible for lifecycle of specific services
Process Owner	Responsible for process management and execution
Process Manager	Responsible for process management and execution
Process Practitioner	Responsible for process management and execution
Configuration Manager	Responsible for certain processes and functions
Capacity Manager	Responsible within certain processes and functions
Service Desk Specialist	Responsible within certain processes and functions

Table 3. ITIL roles.

3 Agile software development

Agile software development was originally promoted by a group of 17 software professionals in 2001 by presenting a manifesto, which describes values and principles for agile software development. The values and principles are based on experiments by these 17 software professionals from their earlier projects. All software development methods that were known before the manifesto for agile software development were process-based methods, and, because of that challenging in modern day dynamic organizations. The new Agile philosophy was able to tackle these challenges. (Beck et al. 2001; Misra et al. 2012.)

Why is agility is needed from companies? Agility can be described as the ability to react quickly to changes and it also involves the optimal balance between the need for stability and a suitable level of flexibility. (Ciric et al., 2019.)

Agile and agility are highly topical topics today. They are mostly related to software development but can be also used in other fields. The key to agile software development methodology is an incremental and iterative approach. Agile methodology is also concerned with flexibility and acceptance of change in addition to other features on agile. (Ciric et al., 2019.)

As Shellenberger (2019) describes agile management as an un-tempo approach that changes rituals and roles inside you team and organization. There is no single determination for being agile, it can be said to be a group of principles that aims to help teams to avoid departmental silos or bureaucracy so that teams are able to work more efficiently.

Misra et. Al. (2012) argue that the objective for agile software development is to satisfy customers by producing valuable parts of the final product early. Agile organizations truly focus on customers. In highly bureaucratic organizations, focusing on customers

means that service management and service teams are doing what they can for the customers, but limits are set by the organization's internal rules and processes. In a truly agile organization, everything in the organization, including goals, values, principles, processes, systems, and practices are geared to creating value for the customers. (Denning 2016.)

Agile software development is an umbrella term for different frameworks and practices that are presented in the Agile Manifesto (Beck et al., 2001).

3.1 Values

The Agile manifesto (Beck et al., 2001) describes the four core values that are listed below. «

1. Individuals and interactions over processes and tools
2. Working software over comprehensive documentation
3. Customer collaboration over contract negotiation
4. Responding to change over following plan «

3.2 Principles

The Agile manifesto (Beck et al., 2001) describes also twelve key principles that should be followed:

«

1. Satisfying customers through early and continuous delivery of valuable work
2. Breaking big work down into smaller tasks that can be completed quickly
3. Recognizing that best work emerges from self-organized teams
4. Providing motivated individuals with the environment and support they need and trusting them to get the job done
5. Creating processes that promote sustainable efforts

6. Maintaining a constant pace for completed work
7. Welcoming changing requirements even late in the project
8. Assembling the project team and business ownership on a daily basis throughout the project
9. Having the team reflect at regular intervals on how to become more effective, then tuning and adjusting behavior accordingly
10. Measuring progress by the amount of completed work
11. Continually seeking excellence
12. Harnessing change for a competitive advantage «

Williams (2012) undertook a survey of teams in the software industry and the results showed that the original twelve principles still deliver suitable guidance for teams working in agile an Agile framaework. Guidance made for Agile software development in 2001 is still relevant and companies in all industries have started to work according to Agile methodologies.

3.3 Agile benefits

As Shellenberger (2019) describes, Agile has many kind of benefits to offer. Efficiency can be achieved by the best-known practices of Agile such as sharing big projects to smaller tasks, daily meetings with the team to share information about progress and also to eliminate obstacles, and sprints, which are time periods that have listed tasks that needs to be done during each sprint.

The Agile way of building systems is often found to be cheaper, faster and better way compared to traditional ways of building systems. (Hussey & Baile 2016.)

3.4 Agile challenges

Regarding the challenges and risks of Agile, one enormous risk is that Agile requires both team and company to work in a totally different than traditionally and self-managed teams will be implemented in the organization. Agile software development emphasizes that teams should be self-managed but Scrum and Agile methods don't offer any guidelines how shared leadership is implemented, and this can be raised as one of the weaknesses and risks. (Moe et al., 2009.)

Sometimes using Agile is used as an excuse for weak documentation, loose control or weak contracts and these issues are emphasized by general critics against Agile. (Hussey & Baile 2016.)

3.5 Scrum

As the Agile manifesto was described earlier as a philosophy, there are many specific methodologies and frameworks that describe and formalize the ideas of the Agile manifesto. One of these Agile frameworks is Scrum, which is presented in more detail in this section.

Scrum is one of the Agile frameworks and it is used for developing, delivering and sustaining complex products. It is good to understand that Scrum is not a process, technique, or definitive method and with Scrum it is possible to use various processes and techniques. Scrum is known to be lightweight and simple to understand but also difficult to master. (Schwaber & Sutherland 2017.)

Schwaber & Sutherland (2017) defines that the Scrum framework includes Scrum teams and their roles, events, and artifacts. These are described in the next chapter (table 3, table 4 and table 5) and events and artifacts are presented also in figure 2. The rules of scrum are meant to create a bond between roles, events and artifacts.

The Scrum framework is combined in next chapter with ITIL processes and main lifecycle stages. The aim is to create a framework for service management by combining Agile methodology and the Scrum framework with an ITIL framework.

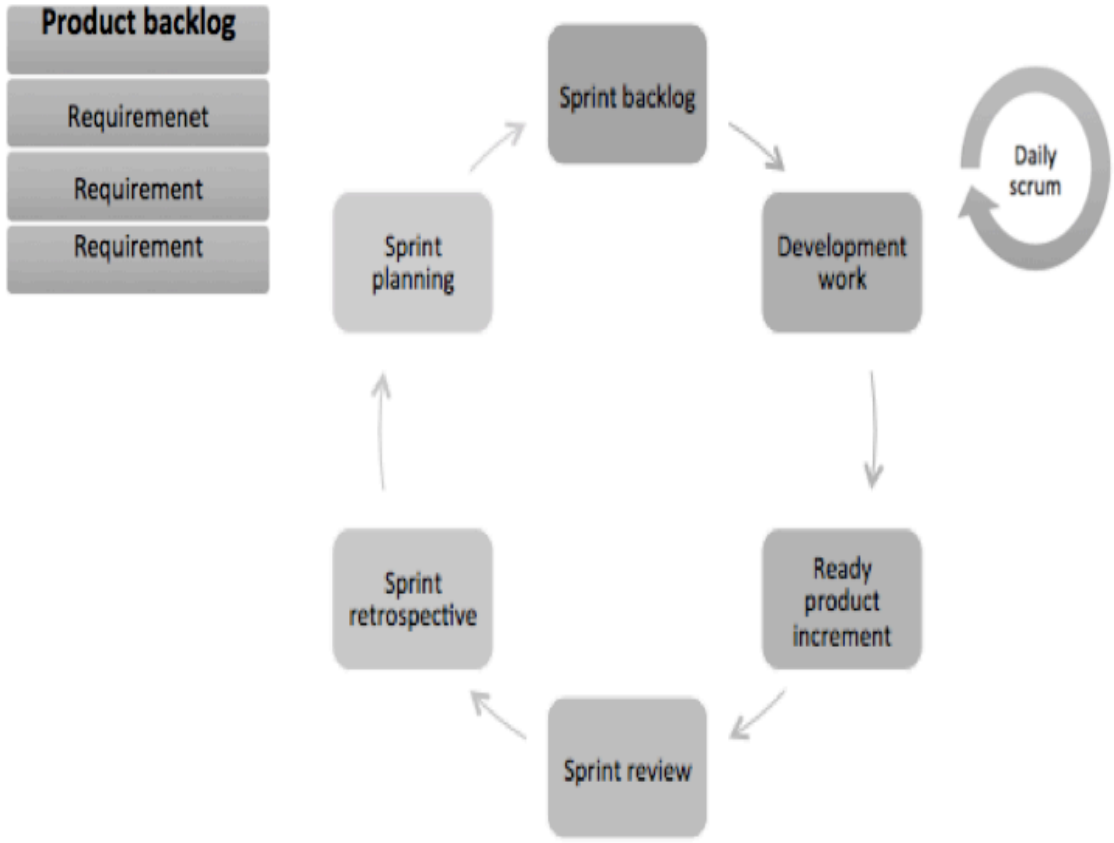

Figure 2. Scrum events and artifacts (adapted from Lichtenberger 2014).

3.5.1 Theory

Scrum is a process framework, which has been used since the 1990s to manage and develop products. This Agile process framework is based on empiricism, the concept that presents ”knowledge comes from experience and making decisions based on what

is known". Scrum has an iterative and incremental approach so as to manage predictability and risks. (Schwaber & Sutherland 2017.)

Scrum has three pillars that are transparency, inspection and adaption. These three pillars are also described in figure 3. Transparency raises the importance of information visibility. Scrum requires that meaningful aspects of the proces must be communicated and visible to those who have their outcome as their responsibility. Inspection involves a review of progress toward the sprint goal so as to notice possible unwanted variances in the work. Adaptation concentrates on possible deviations noticed in inspection and whether deviations will cause unacceptable product outcomes. It means that some adjustments are needed either in processes or the material that is processed. It is important that adjustments are made as soon as possible after deviations are noticed. (Schwaber & Sutherland 2017.)

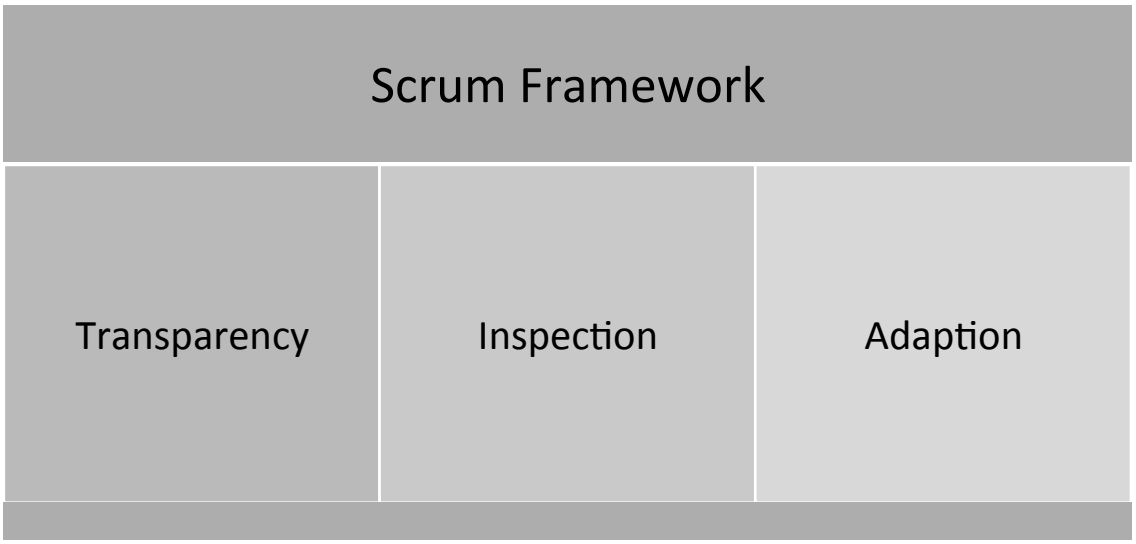

Figure 3. Scrum three pillars

3.5.2 Values

Schwaber & Sutherland (2017) present five Scrum values:

- Commitment

- Courage
- Focus
- Openness
- Respect

These listed values are followed by Scrum team members and create a culture where all team members respect and can trust other team members. More detailed information about different roles in a Scrum team will be described in next chapter.

3.5.3 Roles

The Scrum team includes three different roles: a Product Owner, the Development Team and a Scrum Master. All roles, including responsibilities and characteristics for each role, are presented in table 4. There are two important characteristics of scrum teams, that they are self-organizing and cross-functionality. Self-organizing teams can decide by themselves how to perform their work and they manage their work, responsibilities and schedules by themselves. Cross-functionality means that the team has members from different areas so as to be able to accomplish work without help from outside the team. (Schwaber & Sutherland 2017.)

Scrum role	Responsibilities	Characteristics
Product Owner	• Responsible for managing product backlog, which includes prioritization, clear expression and clarification of backlog items. • Responsible also for ensuring visibility, transparency of product backlog • Making sure that Scrum team knows what to do next.	• Product owner is always one person, not a group of people
Development Team	• Development team creates increments.	• Development team size should be something between 3 to 9, because it should be small enough to be agile but large enough to be able to complete enough work in a sprint. • In Scrum there are no titles for development team members. • Accountability belongs instead of to individuals to the development team as a group.
Scrum Master	• Ensuring and helping to follow Scrum as defined in the Scrum Guide • Act as a servant-leader for Scrum team • Helps Scrum team and all stakeholders to understand Scrum. • Maximize value created by Scrum team	• Scrum master serves product owner, development team and organization in different ways to work as far as possible following Scrum

Table 4. Scrum roles (Schwaber & Sutherland 2017).

3.5.4 Events

Scrum defines particular events which create frequent, focused meetings that help to minimize other more general meetings. All Scrum events have a maximum duration called the time-box. The Scrum master takes care to train the Scrum team to keep meetings within the agreed time-box. Table 5 presents all Scrum events including a description, the time-box and participants for each event. All events listed are an op-

portunity to inspect or adapt, according to the Scrum pillars. (Schwaber & Sutherland 2017.)

Scrum event	Description	Time-box	Participants
The Sprint	• During every sprint releasable product increment is created. • Sprint contains all other events listed and actual development work. • Next sprint starts right after end of earlier sprint. • Sprint always has a sprint goal, which defines the objective for the sprint and describes for development team the reason to build that increment.	One month or less, decided before sprint start and can't be modified during the sprint	Scrum team and stakeholders
Sprint Planning	• Planning sessions for work that will be performed in sprint.	For one month sprints eight hours	Scrum team
Daily Scrum	• Held everyday at the same time and same place • Development team makes a plan for the following 24 hours	15minutes	Development team
Sprint Review	• Held at the end of each sprint for collaboration between Scrum team and key stakeholders • Sharing information about what was done in the Sprint and what to do next • Inspection of increment • Adaptation of product backlog if needed	For one month sprints four hour Sprint review	Scrum team and key stakeholders
Sprint Retrospective	• Possibility for Scrum team to inspect themselves in last Sprint especially from people, relationships, process and tools point of view. • Held after Sprint review • Scrum Masters responsibility is to ensure positive and productive feeling in the retrospective • Sprint retrospective should result in ideas for improvement and a plan how to adopt those ideas in next Sprint.	For one month sprints three hour retrospective	Scrum team

Table 5. Scrum events. (Schwaber & Sutherland 2017).

3.5.5 Artifacts

Transparency is one of Scrum´s main pillars. The Scrum Master works with the Scrum team and other stakeholders to understand if artifacts are truly transparent to ensure a common understanding among the Scrum team, and if not then works towards complete transparency. Scrum artifacts are presented in table 6. Because decisions regarding optimizing value and controlling risks that are governed by the artifacts, complete transparency creates a reliable, shared factual base for important decisions. (Schwaber & Sutherland 2017.)

Scrum artifact	**Description**
Product Backlog	• List of all things that are needed in the product. • All requirements for the product are listed in the product backlog. • Product Owner is responsible for updating Product backlog.
Sprint Backlog	• Group of items from Product backlog that are selected for the sprint. • Estimate from Development team about features that will be part of next increment.
Increment	• Sum of product backlog items completed in sprint

Table 6. Scrum artifacts (Schwaber & Sutherland 2017).

4 Framework for Agile Information Technology Service Management

Over recent years IT and IT management have been moving to be more agile. In IT companies development teams and also employees working in IT projects are usually familiar with Agile theory and it´s values and principles. Now it is time to move Agile theory also to IT service management. However, it is important to understand that IT operations are highly process-oriented and focused on control and initial commitments as Verlaine (2017) describes. (Verlaine 2017.) That means that traditional service management methods need to be re-evaluated and find ways to combine Agile values and principles with traditional ITSM. In summary, Agile service management means bringing values of Agile and an Agile mindset to ITSM by supplementing already known process oriented frameworks like ITIL.

Moving to Agile is not only a technical decision, moving towards Agile needs significant changes to business implications and cultural changes. Initially, Agile enabled customer-focused and rapid development of products in software development but after that business leaders also started turning to agile. One main characteristic of Agile and Agile organizations is that work should be done in autonomous cross-functional teams and in short cycles. (Hussey & Baile 2016; Denning 2016.)

Comparing presented Agile values to ITIL there can be seen to be clear differences. Agile values one and two call for *Individuals and interactions over processes and tools* and *working software over comprehensive documentation,* and ITIL is highly process-oriented framework and clearly focused on process descriptions. The third value is *customer collaboration over contract negotiation,* which again conflicts with ITIL, because contractual agreements and service level agreements (SLAs) are an important part of ITIL to measure outcomes of service. And when combining Agile and ITIL it is important to re-evaluate SLAs and the reasons behind the, and dispute if those are helping to fulfill customer´s expectations. The fourth Agile value is *responding to change over fol-*

lowing a plan, which conflicts with the ITIL framework. In ITIL is about process thinking and a pre-programmed plan that is followed so closely that no changes are made to the process even if needed. However there are no conflicts between the objectives of ITSM and Agile and these can be reviewed from figure 5. (Beck et al., 2001; Louisnord 2018.)

As argued in Chapters two and three above, ITIL and SCRUM are not mutually exclusive, because ITIL is best practices for ITSM and it provides terms and detailed processes for service management. As presented above Scrum is a framework for Agile product development. Even if some differences were noticed between Agile values and the ITIL framework, the possibility that these two are complementary is also recognized. This chapter describes how ITIL and Scrum frameworks can be combined as an Agile service management framework including integration of the ITIL service lifecycle and Scrum events and artifacts, roles and objectives.

When combining ITIL and Scrum frameworks for Agile ITSM it is important to understand that, even if moving towards an Agile framework service teams and companies are able to modify ways of doing things according to their needs and limitations. For example, deployment can be done as wanted. It is not required to deploy the solution in increments. (Hussey & Baile 2016.) Agile service management should be seen has a possibility for ITSM to utilize Agile methodologies.

As presented in chapter 2, ITIL is a process-centric framework to provide value for the customers. Agile method and Scrum concentrate more on the software product view as presented in chapter 3. The process was described as a set of steps taken by participants in a work activity to accomplish same goal. Merriam Webster (2020) defines product as ”something resulting from or necessarily following from a set of conditions” and Lexico (2020) describes products as ”A thing or person that is the result of an action or process.” That clarifies the connection between product and process more clearly; product is the end result of process. This difference can be perceived in this chapter´s terms regarding Agile service management roles and artifacts. The word

“product” used in Agile is substituted in Agile service management by process. Agile service management terms are presented in more detail later in this chapter.

4.1 High level framework

Figure 4 presents the integration of ITIL and Scrum frameworks and how different Scrum artifacts and events can be included in different ITIL service lifecycle phases. This framework shows that Scrum artifacts and events are mainly added as part of the service design and service transition phases.

The service design phase includes design and defining of the architecture, processes, systems and tools. In terms of Scrum artifacts as described above, the product backlog is replaced by the process backlog, which is equivalent to the service design lifecycle phase in which the service design is produced and listed matters designed. The process backlog improves the transparency of requirements listed in it and makes the requirements and their prioritization available to all stakeholders. This helps to achieve a smooth build and efficient operations, which is the objective for the service design phase.

The service transition phase is about planning and management of the actions needed to bring the service to production. The service transition phase is about planning transition to services that were planned in the service design phase. In this phase it is highly important to make sure that customer specifications are fulfilled. Scrum events help in this phase by providing events and artifacts for the continuous development of increments and continuous planning and communication between the team and key stakeholders. Scrum provides planned events to enable inspection and adaptation.

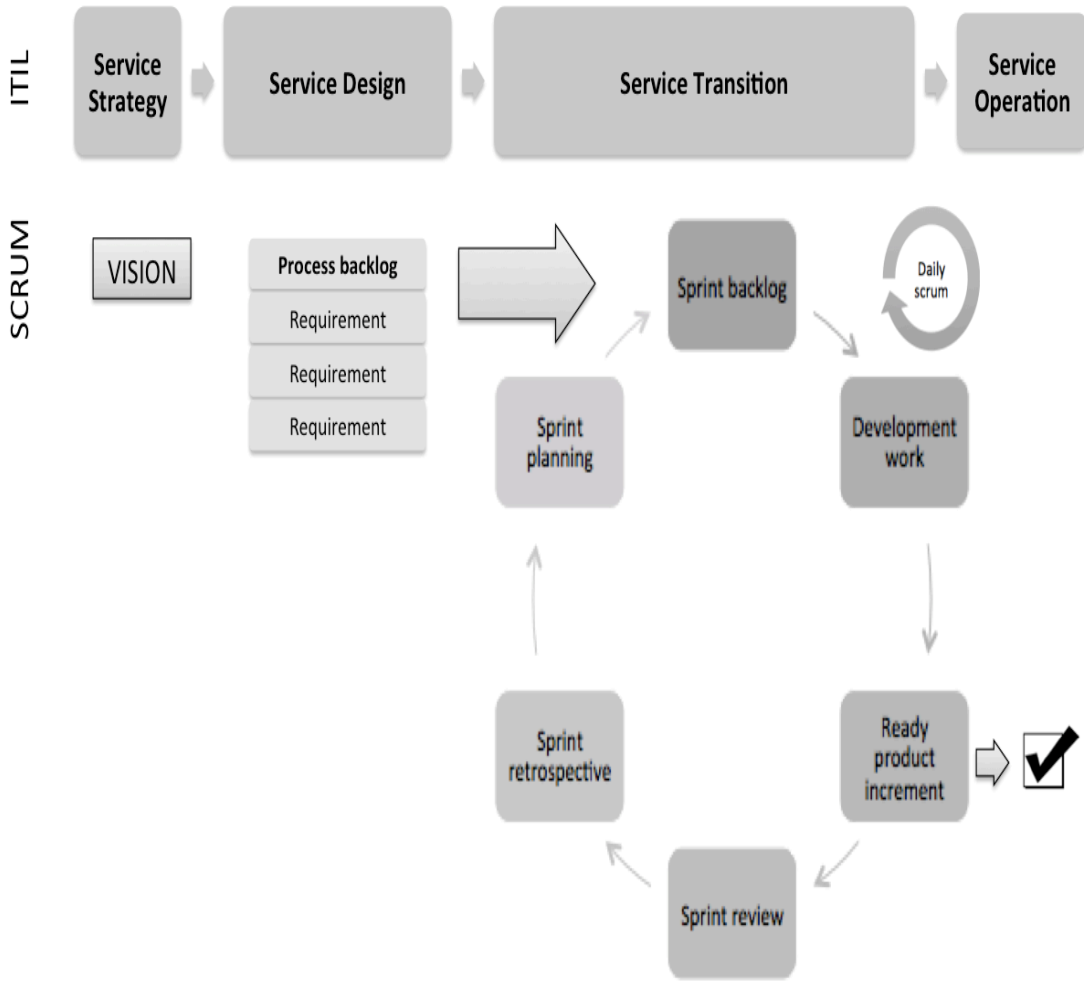

Figure 4. Agile framework for ITSM (adapted from Lichtenberger 2014).

4.2 Objectives and roles

An artifact, events and service lifecycle of Agile Service Management is presented in figure 4, which gives a framework for service management in Agile environment. Objectives for Agile Service Management are presented in figure 5. Roles of Agile Service Management are presented in figure 6.

4.2.1 Objectives

Figure 5 below present objectives for ITSM (ITIL) and the Agile method (Scrum). As we can see there is no conflict between the objectives of these two because in both objectives the customer needs and the responsibility to satisfy customers are stated. These objectives are combined in Agile Service Management, since the goal is to deliver and support quality IT services in increments that support business goals and customers needs. That objective combines both individual objectives.

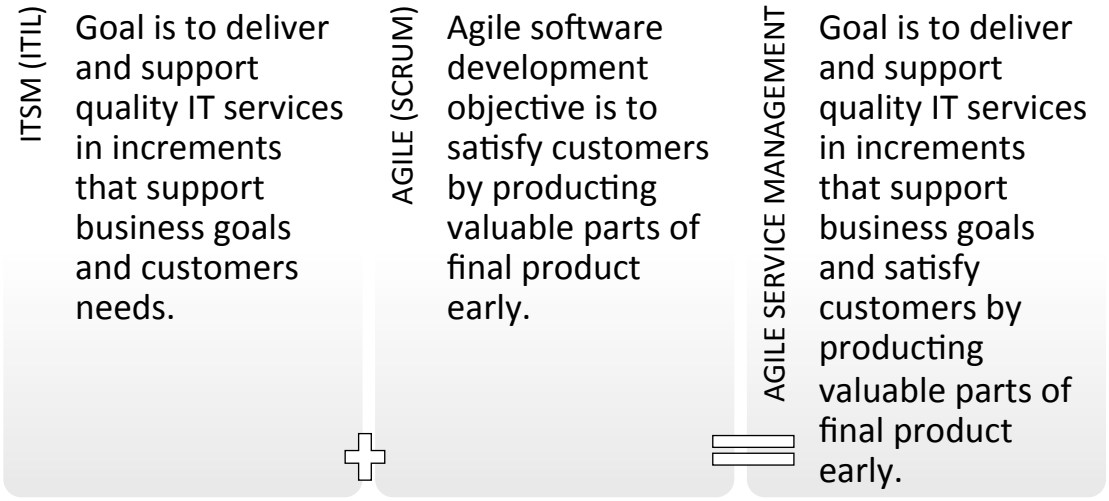

Figure 5. Agile service management objectives.

4.2.2 Roles

The Agile Service Manager role is a combination of the ITIL Service Manager and Scrum-master roles. The Agile Service Management is not manager of the development team because the team is self-organized team. The Agile Service Manager role includes responsibilities of helping the team to understand Scrum practices and rules

and facilitating Scrum meetings and also to working as facilitator, coach and as servant-leader. (Groll 2020.)

The development team in Agile Service Management includes the same kind of characteristics as the development team in Scrum (Table 4). These characteristics are the development team's size should be somewhere between three and nine, to be enable it to be agile and complete the required work during the sprint. Agile service management development teams should also be cross-functional and self-organized.

Because service management concentrates on processes, the Scrum Product Owner title is changed to Process Owner in Agile service management. The Process Owner in Agile service management is responsible for the process backlog, including prioritization and definitions of process backlog items, which can also be called also as requirements.

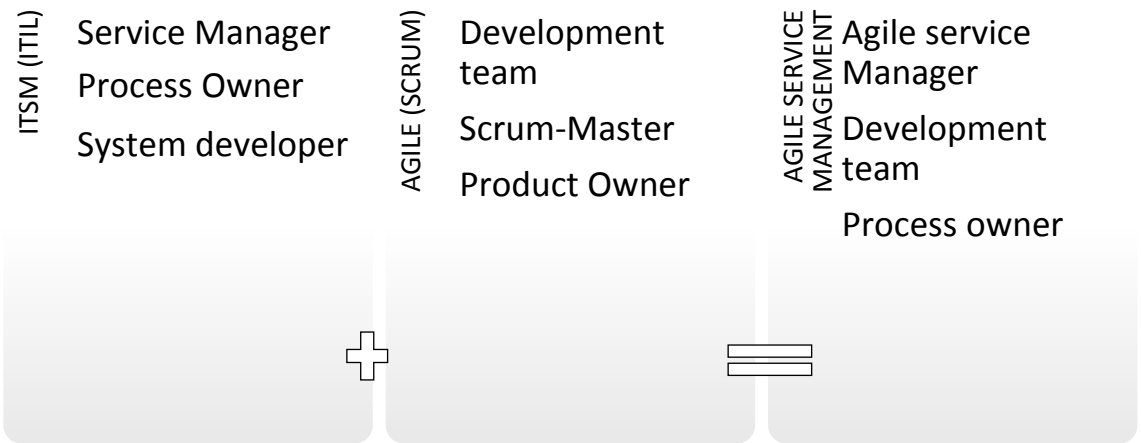

Figure 6. Agile Service Management roles (adapted from Groll 2020:24-27).

5 Methodology choices for research

5.1 Population and sample

The population for this Master´s thesis research is service management professionals working in Finland in the IT industry. The sample of population was selected from LinkedIn using research and filtering by the title “service manager”, “Information Technology & Services industry” and the country “Finland”. Random selection was used to select respondents from this population. This research population is estimated to number approximately 1 600. This estimate is based on the LinkedIn results found by the filters mentioned previously, however probably the population is smaller because that search can include also other that Service Managers working in IT industry. The sample of this population is all service managers who answered the survey. They numbered 63, which means that the sample presents about 4 % of the population. Four answers were deleted because based on background information those answers were not from a service manager, or the company was not located in Finland.

5.2 Collecting data

Empirical data can be gathered from different sources, and many times the preferred way to collect data is by survey, which is used also in this master´s thesis. Bonometti & Tang (2006) argue that conducting a survey includes five different stages that are:

1. Designing the survey questionnaire
2. Determining targeted answerers to contact
3. Selecting suitable survey marketing and distribution methodology (considering anticipated response rate, cost of distribution and subsequent collection of results and timeline of the data collection process)
4. Collection of data submitted by respondents
5. Analyzing collected data

These stages were followed in this research starting from designing the survey questionnaire and finishing with the data analysis phase.

In this Master´s thesis data was collected by survey, which was done by the Google forms tool. This data collection method was selected because survey distribution is very fast, efficient and low cost and from the data analysis point of view, survey results can be viewed continuously (Bonomentti & Tang 2006). The survey questionnaire was designed based on the research questions and theoretical framework.

The survey was reviewed and commented on by three test persons and changes were made based on their comments. After testing and modifying the survey it was sent to potential respondents who fulfilled the population criteria by LinkedIn private message or by email which included an introduction message and a link to the survey. The survey message and link was added also to the LinkedIn group IT Service Management Forum Finland (itSMF Finland) to be able to find more respondents more quickly. ItSMF is a not-for-profit organization of IT Service Management professionals worldwide. (IT Service Management Forum Finland 2020.) Respondents had two weeks to answer the survey, which was open 14.5.-28.5. Survey distribution started May 14th. Questions asked in survey can be found in Appendix 1.

Questions are standardized in the survey, which means that all respondents have the same questions. Questions 1-7 were structured multiple-choice questions and questions 8-9 were open comment questions.

5.3 Analyzing material

The research questions determine the method for the research, and so this research has qualitative and quantitative research characteristics. Method combining best of qualitative and quantitative research is called mixed. (Leppink 2017.) Quantitative re-

search presents conclusions about a population by studying sample from that population. The population is the entire group being studied (Lowhorn 2007).

Researchers debate continuously about the use of a qualitative vs a quantitative approach in research. These two approaches, qualitative and quantitative , have different characteristics. While the qualitative approach is marked by subjectivity and has a soft image, quantitative research is marked by objectivity and it forces individuals and human behavior into categories (Abusabha & Woelfel 2003). In qualitative research, collected data is mainly words and most of the work or thinking is done after data collection. In quantitative research data is normally numerical data and most of the thinking regarding data collection happens before data collection. In quantitative research, a sufficient sample size is required. (Leppink 2017.) Questions in each type of research have to be framed differently to elicit the wanted data. In qualitative research questions are usually ”how?” and ”why?” questions, for example how something is experienced, while quantitative study, questions are usually more like “What?”, “How many?” and “How often?” questions.

In this Master´s thesis qualitative research is used to analyze open comments questions to understand the respondents experiences about the benefits and challenges that they have experienced regarding combining Agile methods with service management. Data was analyzed in a detailed way by content analysis. Qualitative data analysis can be challenging and time-consuming and Erlingsson & Brysiewicz (2017) have presented a framework for qualitative content analysis, which is followed in this thesis. The main idea is to start by reading and re-reading answers and trying to gain a general understanding about the participants answers, and after that trying to divide the answers into smaller meaning units. After that, the meaning units are condensed, while making sure that their core meaning is retained. After that, the next step is to formulate codes based on the condensed meaning units and then grouping codes into categories. The last phase is to create themes by combining categories. In this thesis themes were created in accordance with the literature review. All listed phases of con-

tent analysis are repeated during content analysis because it is a reflexive process as qualitative analysis always is.

Quantitative research characteristics are used when analyzing results on background information questions and questions about what Agile events, roles and artifacts are added as part of service management. These questions are analyzed by calculating percentages and numbers and because of that quantitative research is used to analyze these questions.

5.4 Reliability and Validity

Reliability means in quantitative research that similar conclusions would be reached if another researcher used the same method and participants. Reliability means in qualitative research the possibility of reproducing the results. (Lowhorn 2007). In this thesis reliability is achieved by clearly defining the survey questions, the method of analysis used, the population and the sample.

Lowhorn (2007) defines validity in quantitative research as the ability of the instrument to measure what it supposed to measure: for example in this master´s thesis the survey was conducted to measure what Agile events, artifacts and roles were used by service managers and service teams and what kind of benefits and challenges were experienced. In qualitative research validity means mainly credibility and trustworthiness because qualitative study is not trying to make summary conclusions about the population. In this Master´s thesis methods are selected based on what information is needed and what choices are justified.

6 Results

This chapter presents answers to the survey questions and each question is analyzed in its own chapter. The last chapter presents summary of results by combining results to research questions 1 that were presented earlier in chapter 4 and answers for research questions 2 and 3.

6.1 Analysis implementation

Analysis of collected data started right after the survey response time closed on 28.5. After that it was not possible to answer the survey. The first thing was to read the background information to be sure that all respondents met the population criteria and four responses needed to be deleted because of not fulfilling the presented criteria. Then all background information was quantified and analysis of the background information was done. Content analysis of open-ended questions 8 and 9 was started by reading and re-reading answers and classifying answers to different themes as presented in section 5.3. Analyzing material.

6.2 Background information

Some background information was asked from respondents to makes sure that they are part of the target population. The second reason for asking background information was to use the information in the analysis to explain some answers.

6.2.1 Industry

Because the survey was sent to service managers working in the IT industry and to IT managers working in different industries, all industries were accepted and no respons-

es were deleted or declined based on industry. Figure 7 presents that 46 responses, which is 78% of all answerers were from respondents working in IT the industry.

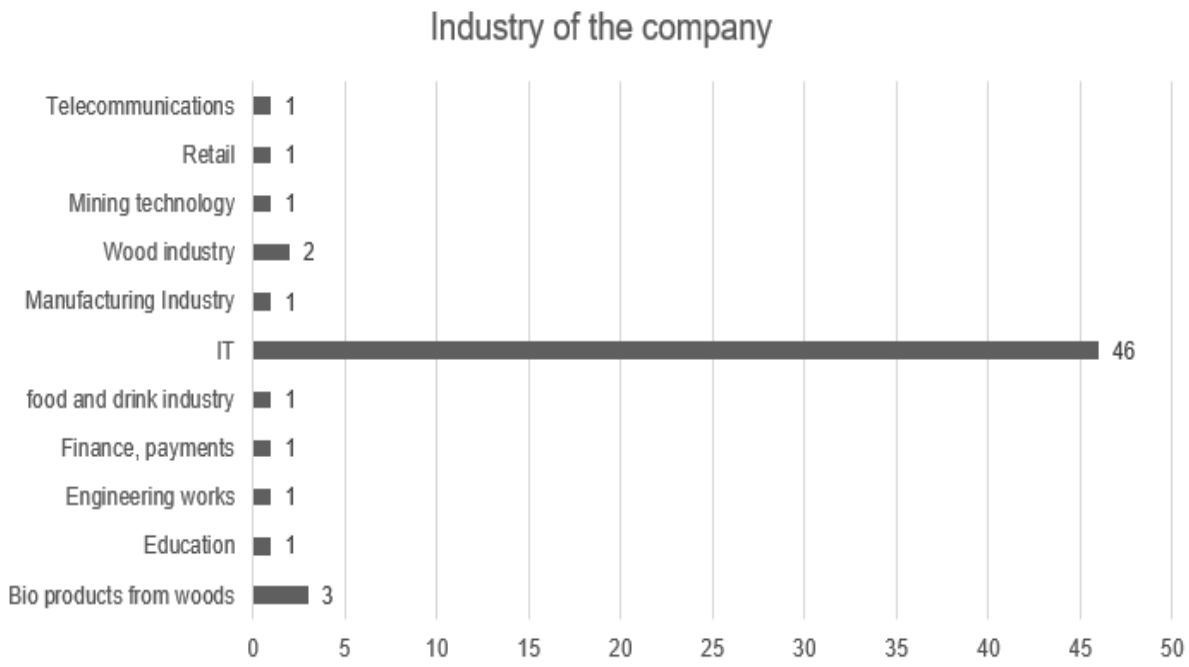

Figure 7. Industry of the company

6.2.2 Amount of employees

The number of employees in the respondents´ companies are presented in figure 8. For the population, there was not limit defining the number of employees. However, the number of employees can affect to ITSM and Agile methods used in companies and because of that it is good to have responses from companies of different size. It should be noticed in the results that most respondents, 68% were from companies with over 500 employees.

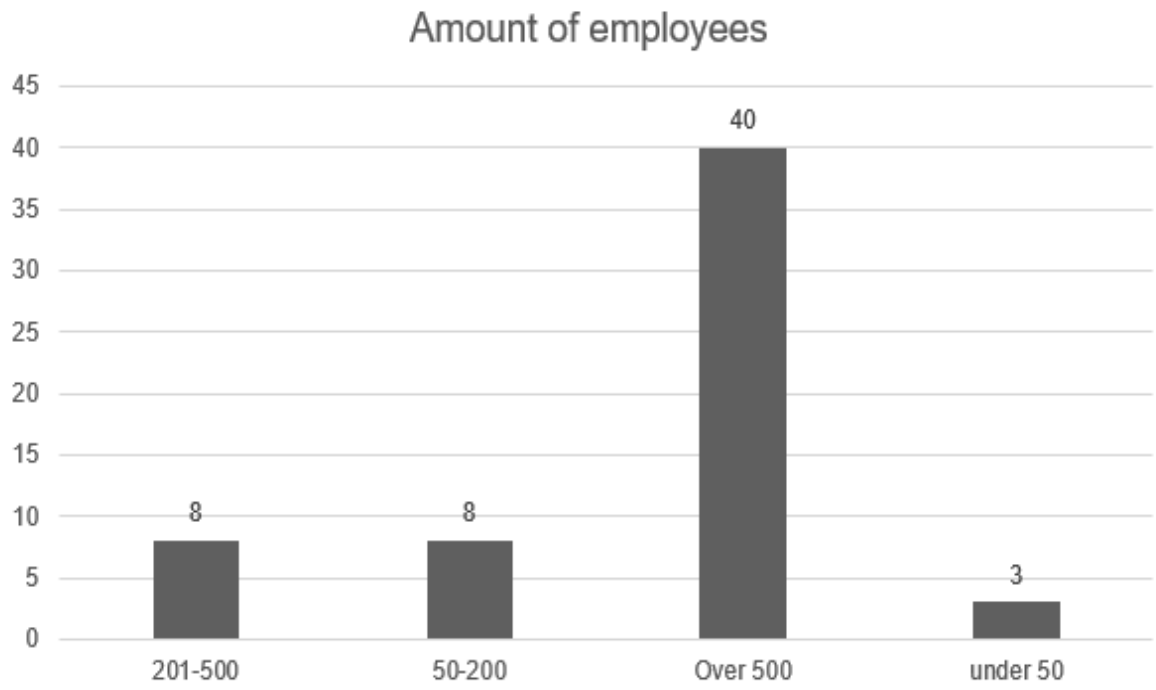

Figure 8. Amount of employees

6.2.3 Location of the company

This research was focused on companies located in Finland, but the company could be working also in some other countries or for example globally. Figure 9 presents location of the respondent´s companies. Most of the companies, 49 (83%) of respondents, were located in Finland, while some companies were global companies, 15 %.

Figure 9. Location of the company

6.2.4 Service management professional

Only answers from service managers were accepted so all respondents were service managers. Answers from other than service managers were deleted because the population was limited to the service managers. Respondents included service managers delivering IT services to external customers outside of their company and service managers delivering IT services to internal customers (for example, business units inside their company).

6.3 Agile roles used

Answers presented in figure 10 show that 13 service managers, which is 22% of all respondents informed that they have not implemented Agile roles. Over half of respondents, informed that they have implemented self-organized teams and the product

owner role was implemented in 30 service management teams. The Scrum-master role was implemented in 23 service teams. Responses show that all roles are not usually implemented in service teams at the same time, service teams are choosing needed roles according to their service teams needs. Respndents were able to select all roles that were relevant in this question; the number was not limited.

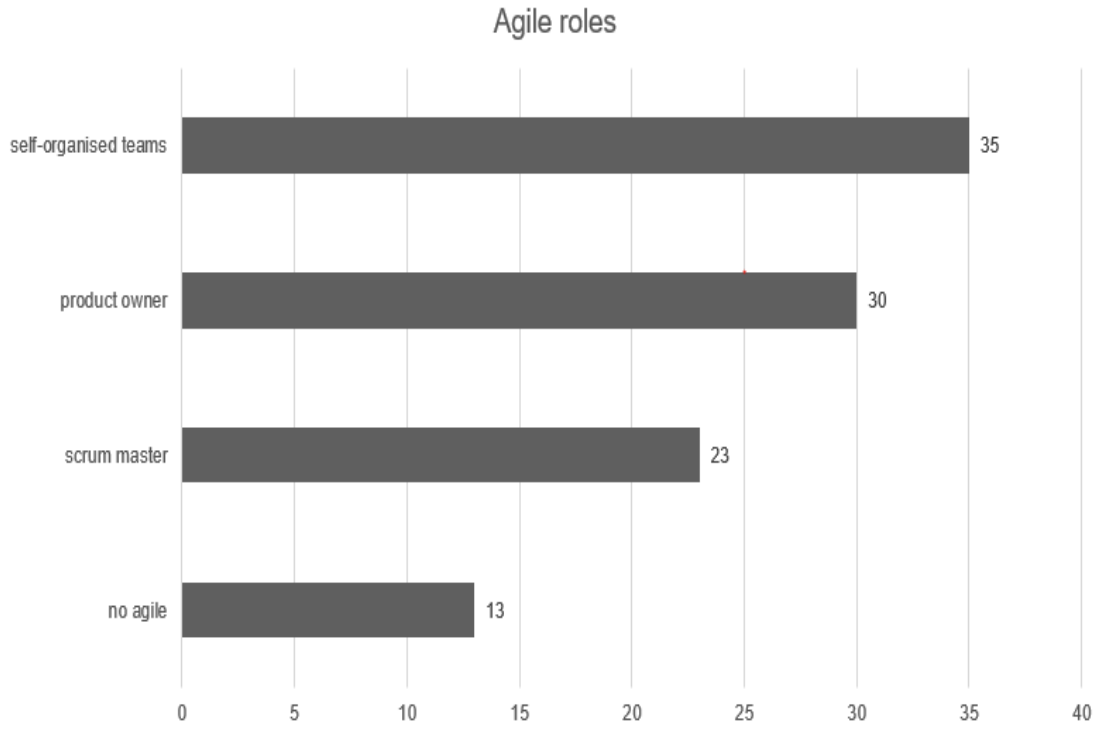

Figure 10. Agile roles

6.4 Agile artifacts used

Responses presented in figrure 11 show that 20 respondents have not implemented any Agile artifacts with their service teams. The most popular artifacts are the sprint backlog and product backlog. It is interesting to observe that 30 respondents have implemented the sprint backlog and 26 have implemented the product backlog, which means that they are using the backlog for shorter periods of time and missing the backlog for longer periods of time. Respondents were able to select all the artifacts that were relevant in this question, the number was not limited.

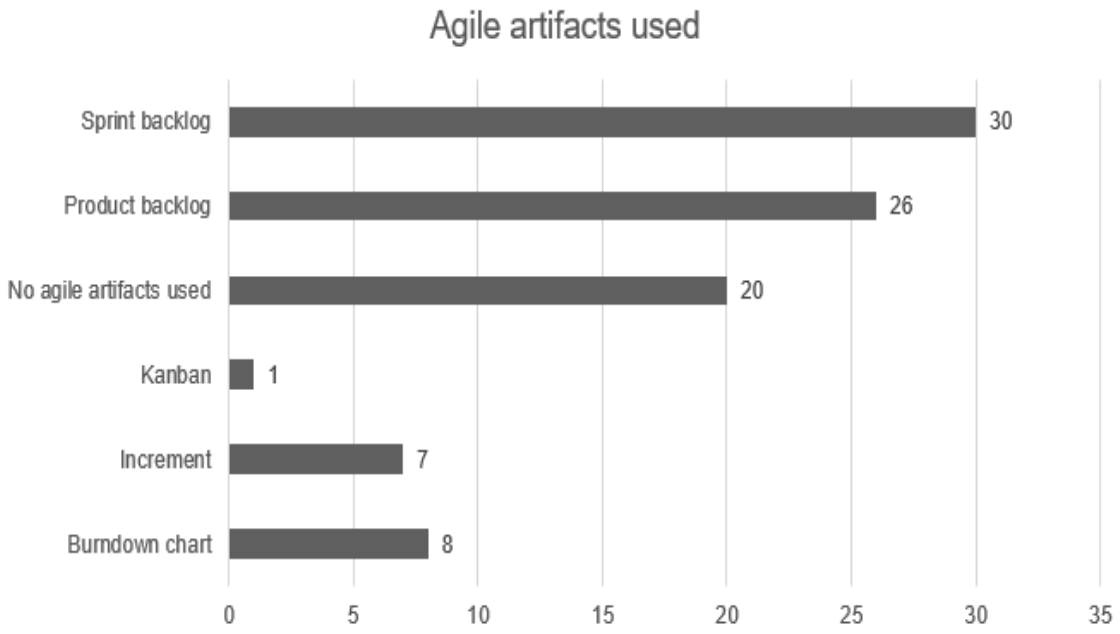

Figure 11. Agile artifacts

6.5 Scrum events

Scrum events are implemented in 63% of responses, because 22 of responses informed that no Scrum event was implemented. The most popular Scrum event is Daily Scrum and Sprint is the next most popular. Respondents were able to select all events that were relevant in this question, the number was not limited.

Figure 12. Scrum events

6.6 Benefits

Themes of answers are categorized according to the theoretical framework, and next to each category there is described how the theme appeared in the answers. Also 24 respondents indicated that no Agile methods were added or no benefits were experienced. All other answers are summarized by themes in table 7.

Theme	Summary of answers
Agile values	Agile values are not raised clearly in answers regarding experienced benefits. However a few respondents raised flexibility which is linked to the Agile value 4 ”Responding to change over following a plan“.
Agile principles	Regarding Agile principles, two of the principles clearly came up and those are Principle 1. « Satisfying customers through early and continuous delivery of valuable work” and 2. “Breaking big work down into smaller tasks that can be completed quickly”. Principle 2 was raised in 37% answers.
Scrum pillars	One topic was clearly raised in answers regarding experienced benefits was the Scrum pilar Transparency. 13 responses, which is 22% of respondents highlighted this benefit.
Scrum values	Team satisfaction and commitment was raised in many answers which is linked to Scrum values.
Scrum roles	There were no answers regarding experienced benefits directly related to Scrum roles.
Scrum events	Many answers raised that Scrum events have increased the communication level, which was seen as a benefit. This was raised in 15% of answers.
Scrum artifacts	No answer directly linked to Scrum artifacts, but transparency, which is discussed under Scrum pillars aboce, is strongly linked to Scrum artifacts since the goal is that all artifacts are truly transparent and Agile artifacts are tools that spread the experienced transparency.

Table 7. Benefits

Three topics arose clearly from the answers, and they are (1) transparency, (2) sharing big work into smaller tasks, and (3) better communication. The following answers highlighted these topics:

Retrospective has been in use even though not with sprint. That has given good feedback and actionable items to improve the subject of retro.

We have deployed only some agile features in my service, not the whole setup. But even that have brought us flexibility e.g. in releasing new features. Through put times have also shortened because of those features.

Better communication between team members, easier to monitor progress in projects, easier to delegate work, transparency (clients are more involved - this can also be seen as a challenge depending on the customer)

Work organizing and prioritization. Transparency between customer

Flexibility, reliability in planning, easier scheduling, open communication within the team

For team, its easier to follow open tasks in sprint mode. Daily (or twice a week daily) meetings are in a very important role in planning the work and discussing about any blockers or questions regarding to sprint tasks. Discussion with the customer is very open and trusting. Feedback is given more actively. Sprint planning meeting is also an important meeting to decide the tasks for the next sprint.

Based on the answers, three rules can be created for service management:

1. Embrace transparency
2. Implement Scrum events to increase communication
3. Achieve quicker lead time by breaking big work into smaller tasks

These rules can be seen as guidance for companies that are starting their journey towards Agile service management.

6.7 Challenges

Themes of answers are categorized according to the theoretical framework, and next to each category there is described how the theme appeared in answers. Also 26 re-

spondents informed that no Agile methods were added or they have not experienced any challenges. All other answers are summarized by themes in table 8.

Theme	**Summary of answers**
Agile values	Most of the challenges experinced, 29%, that were raised in the survey were about the need for clarification for team, customers and stakeholders about Agile models, what main idea was and how, what, when and why. Also lack of customer focus was seen as a challenge. These are related to both Agile values and Agile principles.
Agile principles	Most of the challenges, 29%, that were raised in the survey were about the need for clarification for team, customers and stakeholders about Agile models, what the main idea was and how, when, what and why. These are related to both Agile values and principles.
Scrum pillars	One respondent informed that transparency was seen as a challenge because the customer is micromanagering.
Scrum values	There were no answers regarding Scrum values.
Scrum roles	12% of answerers informed that they have experienced challlenges regarding Scrum roles. Organizational change toward Agile and, for example, toward self-organized teams and the Product Owner role were experienced as challenges.
Scrum events	Two respondents commented on challenges regarding Scrum events, one respondent commented that Scrum events take too much time from real work and another one that daily Scrum felt like micromanagement
Scrum artifacts	Three answerers commented that product backlog is challenging if teams have more than one customer.

Table 8. Challenges

Three topics arose clearly from the answers and they are (1) focus on customer is needed when moving to Agile, (2) clarification of Agile methodologies for team and (3) implementation of Scrum roles. The following answers highlighted these topics:

Implementing and chosing method does not make service management agile, agile needs to be adapted to service management needs

Clear clarification needed about agile models idea what how, when and why

Coaching customers to move to agile

Common understanding what is the goal and purpose of those agile methods is missing.

Customer might expect to get all ready during first sprint, although it had communicated, but still there were very high expectations.

Organizational change is challenge (movign to self-organizing teams)

Sprint model not working in service management, because customers onot like it, customers hostile towards agile, customers do not want to take ownership or be product owner

Product owner not clearly defined and many different procust backlohs because many customers

Based on the answers, three rule can be created for service management:

1. Make sure to clarify to team, customer and all other stakeholders the aim of implementing agile methodologies and describing how, when, what and why.
2. Focus on customer
3. Organizational-change is required to be able to implement Agile roles

These rules can be seen as guidance for companies that are starting their journey towards Agile service management.

6.8 Summary of research results

Following table 9 described all research questions, data source and research results summarized from earlier chapters.

Research question	**Data source and method of analysis**	**Research results**
1. How to combine IT Service Management with Agile methodologies?	Literature review and interview. Framework created validated in interview with ITSM professional.	ITIL and Scrum are combined in chapter 4 and more detailed in Figure 4.
2. What Agile features IT service teams have added as part of traditional service management when moving towards Agile Service Management?	Survey and quantitative analysis.	Figures 10,11 and 12 describe Agile features implemented by the respondents. The most common features were self-organized teams, product owner, sprint backlog and daily scrum. These were all implemented in 30 or more service teams in a sample of 59 service teams.
3. What kind of benefits and challenges has been experienced when combining IT service management and Agile methodologies?	Survey data, qualitative content analysis. Created 6 rules validated in interview with ITSM professional.	Benefits and challenges experienced are described in chapters 6.6. and 6.7. Based on these findings 6 rules are created for agile service management for service managers to be able to accomplish the benefits and overcome the challenges. These rules are presented in figure 13.

Table 9. Summary of research results

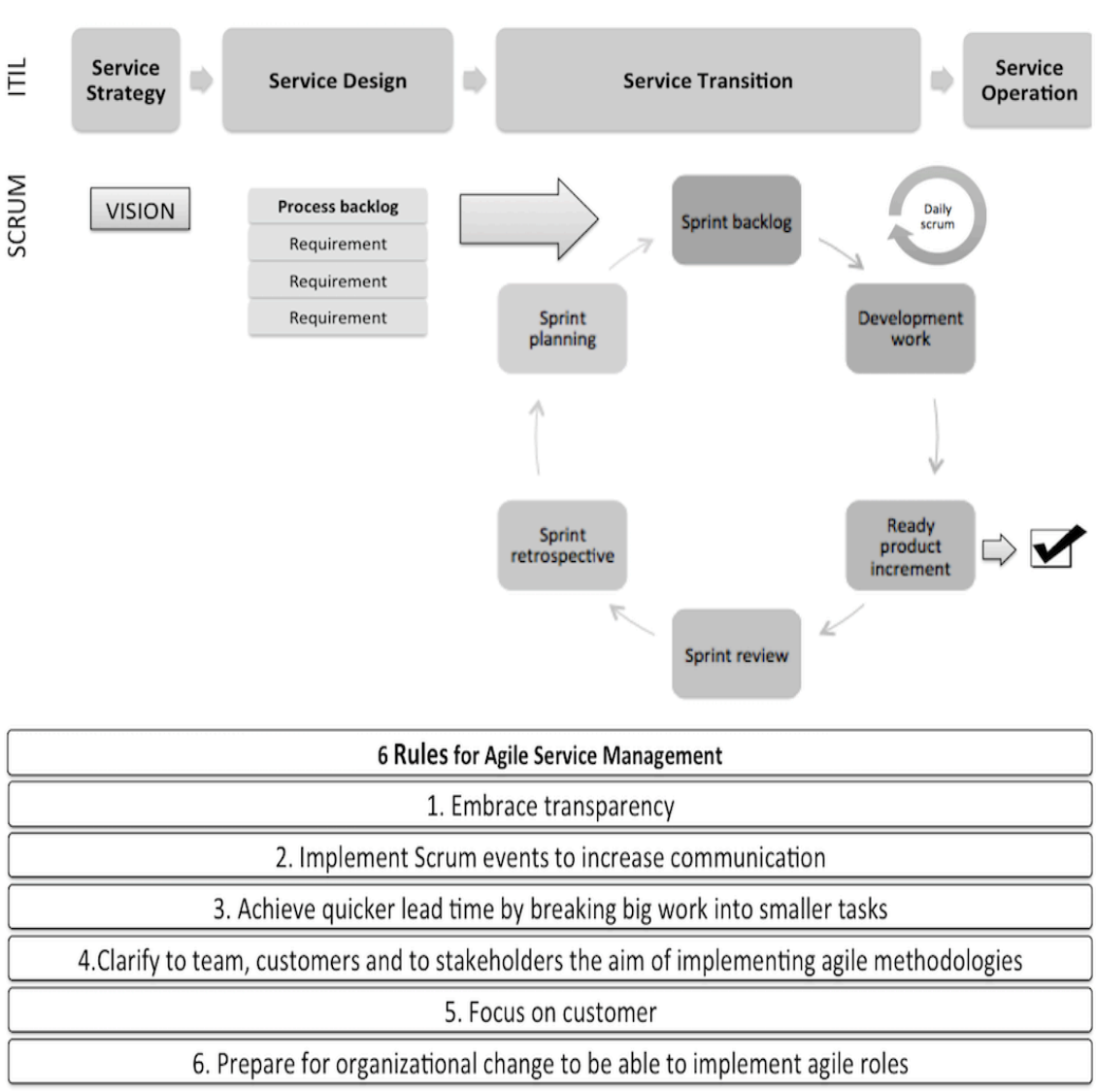

Figure 13. Agile framework for ITSM and 6 rules for Agile ITSM

Figure 13 summarizes the Agile framework for ITSM by combining ITIL and Scrum. Besides that there are added six rules for Agile ITSM based on answers regarding benefits and challenges that were experienced by service managers regarding combining Agile methodologies with ITSM. This Figure was presented to and ITSM professional to ensure the usability of this framework.

7 Conclusions and discussion

The first objective for this Master´s thesis is to describe how ITIL, ITSM best practices can be combined with Scrum to create framework for Agile service management. The second objective is to research what Agile features companies have added as part of service management and to research the benefits and challenges experienced when combining Agile methods with IT service management. These objectives are broken down into three research questions.

The literature review, as part of the theoretical framework, clarified that Agile Service Management is not researched much, even if a lot of research has been done separately regarding Agile methodologies and IT service management. Based on the literature review, this study shows that Agile methodologies can be applied to service management, and regarding that this Master´s thesis presents an Agile framework for IT service management. The framework describes what Agile methodologies can be combined as part of different service lifecycle phases so as to accomplish the objectives of these phases. The framework is described in figure 13.

The survey result and the literature review form a solid understanding about Agile Service Management. An Interesting finding is that benefits and weaknesses that were presented in the literature review appeared also in the survey results. Only one weakness recognized by earlier research, which was a concern about weak documentation in Agile, was not present in the answers of sample service managers. As mentioned in the literature review, Williams (2012) argued that all Agile principles were still relevant. This survey shows clearly that some principles gained all the attention regarding the benefits experienced. Benefits experienced highlighted transparency but neither inspection nor adaptation was mentioned in the experienced benefits. This was also interesting finding.

Based on survey answers regarding benefits and challenges experienced when combining Agile methodologies with IT Service management, this thesis presents six rules for Agile Service Management for service managers to help them accomplish the benefits and avoid the challenges that service managers have experienced earlier when combining Agile methodologies with service management. This research has an important role for IT Service managers to support them in understanding how Agile methodologies and ITSM can be combined and also because this study presents clear rules to help service managers to be able to enjoy about successful implementation of Agile Service Management.

The created framework and the results regarding Agile features implemented and the benefits and challenges experienced regarding Agile service management are relevant to companies that are planning to implement Agile methodologies as part of service management.

Limitations of this study are related to the amount of data collected. This study concentrated in its empirical part on qualitative methods by studying the experiences of service managers. The sample was 63 from a population of 1 600 service managers working in the IT industry in Finland. Because of that results are only suggestive, and it is not necessarily possible to generalize results.

It would be interesting to do further research about implementation of the created framework in a case study company and to collect experiences regarding that. Another interesting further research topic would be to research a different population, for example service managers in the IT industry located in the United States and to see how that would change the results. Also those results of the study, which were different from the formed research could be interesting subjects for further research.

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Appendices

Appendix 1. Survey questions and introduction message

Introduction and survey questions listed here:

Dear reader,

I am student at University of Vaasa from Finland and I am doing my master´s thesis where I research service management in agile environment and I develop a framework for service management in agile environment.

Recipients of this questionnaire I found from LinkedIn and I have selected only service management professionals from IT to answer to this questionnaire.

Information from this Survey will be handled in confidentiality and from results it is not possible to separate any person. No names are needed to answer the questionnaire and I am the only one who handles the information that you provide.

Questionnaire has only 9 short questions and it takes about 5 minutes to answer. You can find the survey from here: **https://forms.gle/xVhS7HPeAvHvTNZm8**

Please respond by 28.5. Thank you for your help!

Best regards,
Heidi Kekkonen
heidi.kekkonen@student.uva.fi

1. Industry of the company?
    a. IT
    b. Other…

2. Amount of Employees?
    a. Under 50
    b. 50-200
    c. 201-500
    d. over 500

3. Location of the company?
    a. Finland
    b. Other…

4. Are you working as a service management professional (e.g. Service Manager, Service Director)
    a. Yes
    b. No
    c. Other…

5. Which agile roles are used in service management in your service team (group of people working to provide agreed service for the customer)?
    a. Scrum Master
    b. Product Owner
    c. Self-organised teams
    d. Other…

6. What agile artifacts are you using as part of service management in your service team?

a. Sprint Backlog
b. Product Backlog
c. Burndown chart
d. Increment
e. Other…

7. Which Scrum events are implemented to service management in your service team?
    a. Sprint
    b. Sprint planning meeting
    c. Daily Scrum
    d. Sprint review
    e. Sprint retrospective
    f. Other…

8. What benefits have you experienced regarding adding agile methods to service management? (If no agile methods added, please inform that in your answer)

9. What challenges have you experienced regarding adding agile methods to service management? (If no agile methods added, please inform that in your answer)