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ICT in Business

AGILE: TRANSCENDING THE BORDERS OF IT

The emerging influence of feedback and creativity

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MASTER'S THESIS

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Abstract

In the search for more effectiveness and in an attempt to speed up delivery, organizations and teams outside of the information technology (IT) domain are shifting. This has resulted in a bigger utilization of the Agile way of working outside of the IT domain.

The study that was conducted applied qualitative research methods and aimed to gain more insight into the application of the Agile way of working by teams and organizations. The data gathering was done by means of semi-structured interviews with eighteen participants. The analysis was performed by using an open-, axial- and selective coding of the data. The participants were spread across the globe and were selected because of their experience in applying Agile outside of the IT domain.

The research question that was posed was: “How does Agile affect domains outside of IT and their processes?”, and was subdivided into three other, crucial questions. The teams and organizations that were studied used the Scrum software tool during their adaptation and implementation of the Agile way of working. They were inspired to use Scrum after they had seen it work in other organizations and after they had read about its success in published literature. They were motivated by the transparency and accelerated delivery that they saw when Agile was applied within teams.

The Agile way of working is based on practices and rituals performed by teams. The results of this study demonstrated that Scrum was the most used and the most useful tool. The teams, when utilizing Scrum, always adopted iteration and frequency, but they did alter several rituals. The applications of Scrum resulted in the alteration of daily meetings, which were changed in terms of their frequency, duration, and how and where the meetings took place. Retrospective rituals were dropped by several teams, a development that was surprising since the Agile way of working is the foundation for an organization that is seeking to learn. Teams that do not reflect on their progress and on their work do not improve.

The study looked into current developments and found that Agile ways of working are usually adopted by domains close to IT first. Eventually, Agile produces change on the organizational level. Not all teams will adopt Agile as we know it in IT, but will, instead, use methods that focus on basic practices that are known in the different domains. This can be seen by the rise in popularity of other methods such as: Design Thinking, Lean Startup, Growth Hacking, and Beyond Budgeting.

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List of abbreviations

ASD	Adaptive Software Development
DoD	Department of Defense
Dr	Doctor
DSDM	Dynamic Systems Development Method
FDD	Feature-Driven Development
HR	Human Resources
IT	Information Technology
JIT	Just in Time
OMG	Object Management Group
ROI	Return on Investment
TPS	Toyota Production System
US	United States
WIP	Work in Progress
XP	eXtreme Programming

1. Introduction

Organizations are confronted by stronger competition and a growing demand to deliver products or services faster. This has motivated organizations to change, and was picked up and discussed by a group of software developers who, in turn, created the foundation for a people-centric, cooperative, collaborative, and dynamic framework called Agile. Software development had created the working conditions to bring “agility” (Agile) to the competitive playing field.

Agile methodologies are no longer limited to the domain of start-ups and small development shops anymore, but are being adopted by large organizations on a global scale (VersionOne, 2016) as a new way of working. Agile as a popular framework in relation to Information Technology (IT) has been very successful in the software development domain. There has been a big shift of non-IT organizations becoming drawn to adopting Agile because they are interested in becoming more effective and in speeding up delivery. Stettina & Hörz (2015) corroborate the effectiveness of Agile: “Agile methods stimulate collaboration on project level through recurring routines; however, they make frequent collaboration also more necessary on portfolio level” (Stettina & Hörz, 2015).

The success of Agile in IT is making other organizations or organizational units more interested in this new way of working because they realize that customers are demanding a shorter time to market and are wanting to see more innovation in product development. This is contributing to the drive for organizations to look for other ways of working during the process of developing products and is leading to a growing interest on the part of non-IT organizations in adopting the Agile. Organizations initially seeking to adopt the Agile way of working are beginning this process by studying and using approaches that have been used by IT companies and organizations.

1.1. Personal motivation

During the last few years, I have been a student who is interested in exploring the boundary between the world of IT and business—the interaction between the two is very interesting. The cooperation between the world of business and the world of IT is very often challenging and, at times, can be confusing. The research that is reported here explores and reflects those subtleties and difficulties.

The move towards the Agile way of working has grown in the last few decades. Around me, I see an increase of organizations that are looking to adapt to the Agile way of

working. I am especially interested in exploring how IT-related frameworks can merge into the activities of business. This is an important new phenomenon and is a topic that should be explored, which is what my research involves.

1.2. Research aims and objectives

Despite the large-scale research that has been carried out on Agile and the way it has been applied within the IT domain, there is either no or very limited research that has been done on the application and its influence on how work is done outside of the IT domain.

Nerur, Mahapatra, and Magalaraj found that the dynamic business environment is a driving force for organizations to continuously adapt and change the way they are structured and for them to design their strategies and policies to manage their organizational surroundings. Changes impact various aspects of the organization, including its structure, culture, and management practices (Nerur, Mahapatra, & Mangalaraj, 2005).

The aim of this study is to contribute to the understanding of the influence that Agile plays within non-IT organizations and how organizations have been inspired by Agile's influence in the IT world. Comprehending this mutual influence provides insight into some of the important issues when one examines Agile's working collaboration within non-IT organizations.

To support an enhanced understanding, the research aims to create a model to understand how Agile works within organizations. The overall research objective is to recognize issues and what best practices could be used when Agile is applied to activities, such as sales and marketing within non-IT organizations; in addition, Agile has significant contributions to make within the field of change management and to an understanding of how other departments could implement Agile.

To answer the above, the following research question has been formulated for this thesis:

“How does Agile affect domains outside of IT and their processes?”

To answer this question, the following three guiding questions have been defined:

- **What methods are used when Agile is applied as a way of working within a non-IT organization?**

- **Which practices do organizations use when applying Agile within a non-IT organization?**
- **What are the challenges, advantages, and key success factors of applying an Agile way of working in a non-IT organization?**

1.3.Scope

This study looks at the way organizations have adopted an Agile way of working within their teams outside of the IT domain. The purpose of the research purpose is to explore the way of working within those teams. The subject is broad and can be explored from different angles. Therefore, it is important to apply a research process that is real-based, thorough, and practical (Leeuw, 2001).

Looking at how the Agile way of working enhanced teamwork and to answer the questions that guided this research, the study looked at how Agile was implemented on the team level. The interviewees were asked about their knowledge about how teams operate and about what methods were used to introduce change during the implementation of Agile. The research did not examine how the Agile way of working had been applied at the organizational level, nor did this research assess whether an Agile implementation had been successful or not. The main objective was to probe different methods used and how they were applied (tab. 1).

Subject	Scope
Individual	Not in scope
Team level	In scope
Project level	In scope
Organizational level	Not in scope
IT	Not in scope
Non-IT	In scope

Table 1 - Scope of this research

1.4.Structure of the thesis

This thesis has been structured as follows: Chapter 1 introduces the research subject, and details the motivation, the aim, the objectives, and the scope of this study. Chapter 2 focuses on the theoretical framework and summarizes what the literature on the subject says: what Agile is; how Agile is applied in other domains; and theoretical findings on Agile management practices and change management. It also describes the role of knowledge management and of routines used in organizations. Chapter 3 presents the methodology applied and explains the research strategy, the research design, the research process, and data collection and selection. Chapter 4 presents the results of this study and the participants, departments applying Agile, the Agile

frameworks, and the motivational and critical success factors as reported by the participants. Chapter 5 discusses how Agile is viewed and how it operates outside the realm of IT; Agile management; and the evolution of management methods. Chapter 6 completes the research by presenting conclusions and recommendations for future research.

2. Theoretical framework

This chapter focuses on providing a review of the literature explaining the history of Agile and what Agile is (2.1). This research summarized in this study focuses only on non-IT organizations where the Agile way of working is broadly applied; this has been done in order to learn the basics of Agile (2.2). An important part of implementing the Agile way of working is change management and organizational learning (2.3).

2.1. What is Agile?

In the late 1980s, US industry was struggling to compete with its rivals—the Asian Tigers¹—which contributed to the growing concern about the downturn of the US manufacturing industry and the loss of American competitiveness. This led to the appointment of an inter-agency task force by US Congress, which instructed the Department of Defense (DoD) to look at US manufacturing with the objective to make it more competitive (Kidd, Agile manufacturing: a strategy for the 21st century, 2004). The recommendations are summarized in the report: “21st Century Manufacturing Enterprise Strategy (1991)” published by the Lacocca Institute at Lehigh University in Bethlehem, Pennsylvania.

This was the first time the term “Agility” had been used to describe a working method/procedure to counter competing forces in manufacturing. Kidd provided three definitions on how Agility could be operationalized:

The concept of Agile Manufacturing is built around the synthesis of a number of enterprises that each have some core skills or competencies which they bring to a joint venturing operation, which is based on using each partner’s facilities and resources. For this reason, these joint venture enterprises are called virtual corporations, because they do not own significant capital resources of their own. This helps to make them Agile, as they can be formed and changed very rapidly (Kidd, 1994).

He went on to provide the following, additional information on Agile:

An Agile corporation is a fast moving, adaptable and robust business enterprise capable of rapid reconfiguration in response to market opportunities. Such a corporation is founded on appropriate processes and structures and the

¹ Asian Tigers is an acronym for: South Korea, Taiwan, Singapore, and Hong Kong. They all had experienced strong industrialization since the 1960s and rapidly grew, becoming a threat to the United States.

integration of technology, organization and people into a coordinated system in order to achieve a quantum leap forward in competitive performance by delivering capabilities that surpass those obtained from current enterprise practices (Kidd, 1995).

The Agile that arises can be used for competitive advantage, by being able to respond rapidly to changes occurring in the market environment and through the ability to use and exploit a fundamental resource - knowledge. People need to be brought together, in dynamic teams formed around clearly defined market opportunities, so that it becomes possible to lever one another's knowledge. Through this process is sought the transformation of knowledge into new products and services (Kidd, 1994).

The inter-agency body concluded in their research that the era of mass production was ending and that US industry must focus on Agile manufacturing to regain its leadership in world manufacturing.

This vision concentrated on achieving customer focus and Rapid product creation (Nagel, 1992) and gave an overview on the way US industry should develop.

The origins of how Agile works lies in quality management (fig. 1). Edward Deming, during a congress in Japan, presented the Deming Wheel (Deming, 1950). This was an alteration of the Shewhart cycle, "Producing, Selling and Inspecting" to which Deming added a fourth step, "Redesign after marketing research". This was adopted by the Japanese and became known as the Design-Production-Check-Research cycle (Moen & Norman, 2006).

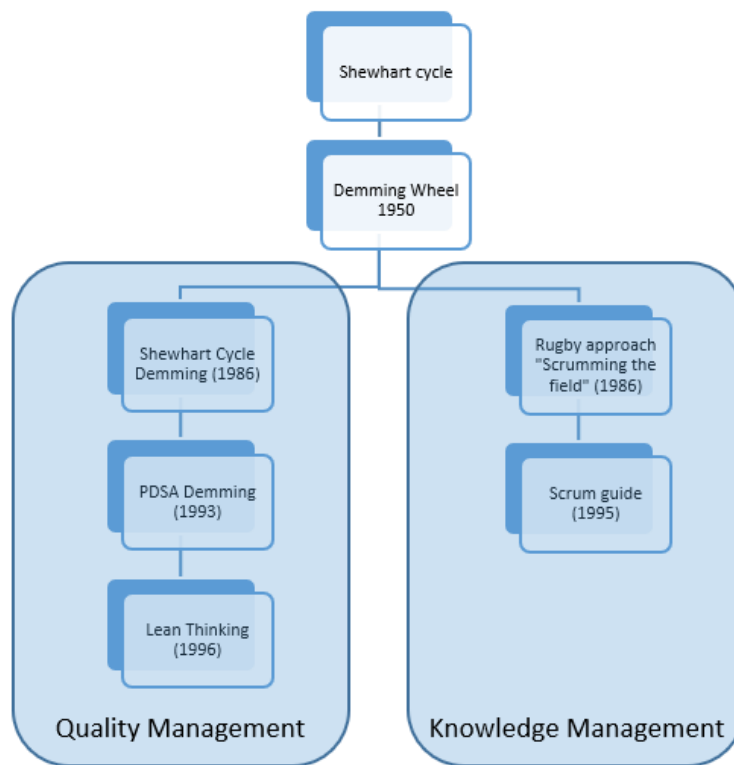


Figure 1 - Origin of the Agile movement

In 1979, the Toyota Production System (TPS) gained interest by the progress Toyota had made since the 1950s. Quality had been significantly improved. The gap between Toyota and other car manufacturers and the role that TPS played in gaining the advantage was presented in the book, *The Machine that Changed the World* (1991), by James P. Womack, Daniel Roos, and Daniel T. Jones. The TPS was named Lean for the first time. The authors studied this way of working and presented the five lean principles in their book *Lean Thinking* (1996).

The quality presented by Toyota was also studied and described by Hirotaka Takeuchi and Ikujiro Nonaka in their article in the *Harvard Business Review* of February 1986 (Takeuchi & Nonaka, 1986), where they mentioned the iterative development flow “Scrum”, named after a rugby move, “scrummage”, which means restarting a game after a minor infringement. A group of eight rugby players work together to get possession of the ball in the game. This was later used by Jeff Sutherland and Keith Schwaber as an acronym in their Agile framework “Scrum”.

2.1.1. The basics of Agile

In 2001, seventeen people came together and created the Agile “Manifesto for Agile Software Development” (Beck, et al., 2001). The full manifesto can be found in chapter

8. This manifesto is based on twelve principles, the main focus of which is continuous delivery of valued software. To achieve this, a feedback loop is used to create the possibility for the customer to change the requirements during the software lifecycle, thus giving the customer a competitive advantage. This loop applies the following four values:

Individuals and interactions	over	Processes and tools
Working software	over	Comprehensive documentation
Customer collaboration	over	Contract negotiation
Responding to change	over	Following a plan

During the last few decades, Agile has spread from software development into other domains within organizations. The motivation for this, becoming more flexible and thus outperforming rivals, is the same as when the Agile movement started in the 1990s. In a review of Agility across many disciplines. Conboy elaborates and evaluates the Agile framework in a software development context and found “Agile supply chains”, “Agile decision support systems”, and “Agile workforces”. These terms were applied collectively throughout an enterprise. He suggests that Agility must be viewed in a “business-wide context”, which means that it is “not a series of techniques but a fundamental management philosophy” (Conboy & Fitzgerald, 2004).

To implement this Agile way of working, those engaged in software development base their activities on the frequent delivery of working software. The focus is on keeping the shortest possible time scale while delivering working software.

To be successful as a team, it is important that those involved in the team work closely together on a daily basis. In addition, it is critical that a certain level of confidence is maintained—that everyone is working to get the job done. Regular reflection and feedback ensure that the team becomes more effective.

The adjectives that are used in an Agile way of working to describe the focus on a short, repetitive work cycle and delivering a functional product are “iterative” and “incremental”. When using the waterfall project method (fig. 2), every step has to be finished before continuing to the next step, which gives project teams only one chance to get each aspect of a project right. In an Agile paradigm, every aspect of development—requirements, design, and so on— is revisited throughout the lifecycle. There is always the possibility of changing the direction of the delivered product.

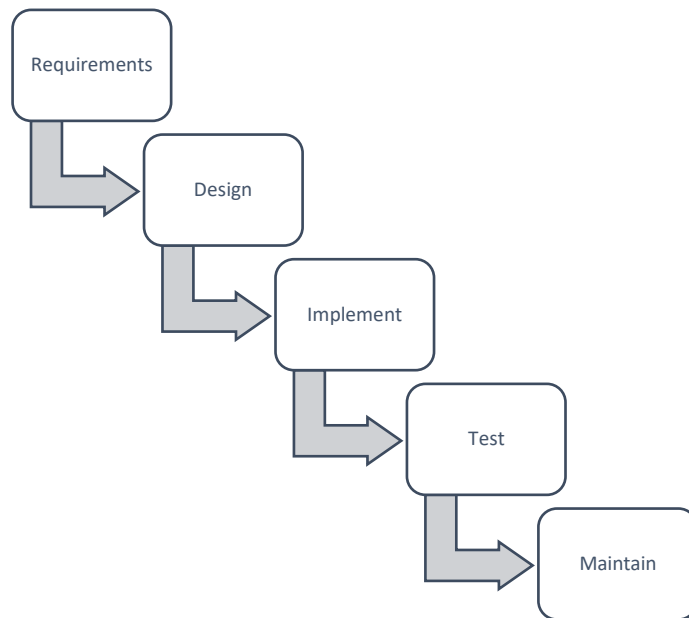


Figure 2 - An example of a waterfall project.

The field of software delivery has developed different methodologies to embrace an Agile way of working. Some examples of this are: EXtreme Programming (XP); Scrum; the Dynamic Systems Development Method (DSDM); Feature-Driven Development (FDD); Kanban; Adaptive Software Development (ASD); Lean; and Crystal, from which Lean, Scrum, XP, and Kanban are most used methodologies at this time (VersionOne, 2016). It is not appropriate to describe all the methodologies in detail; given the scope of this study, this paper will only describe the most used methods in IT: eXtreme Programming (2.1.1.1), Scrum (2.1.1.2), and Kanban (2.1.1.3).

There is no best choice between the different methods. With XP, there are more rules to follow than with Kanban. There is not just one best option; sometimes, even combinations of options are used (Kniberg & Skarin, 2010).

2.1.1.1. eXtreme Programming (XP)

EXtreme Programming was developed by Kent Beck, Ken Auer, Ward Cunningham, Martin Fowler, and Ron Jeffries, all of whom were also developers and signers of the Agile Manifesto. EXtreme Programming improved software development in five essential ways—communication, simplicity, feedback, respect, and courage. By constantly communicating with customers and fellow programmers, the team could keep the design clean and simple. From day one, the testers started giving feedback to the team. The product was delivered to the customers as soon as possible. The team implemented changes as suggested by the client (Wells, 2017).

EXtreme Programming consists of a set of rules divided into five parts: planning, managing, designing, coding, and testing. It was developed to be used in problem domains where both requirements and the functionality often change. This is the reason why risk is addressed early in the process (fig. 3). XP is set up to mitigate risk in order to increase success.



Figure 3 - eXtreme Programming explained
Source: <http://www.agile-process.org/>

2.1.1.2. Scrum

Since the publication of the Agile Manifesto, massive research has been carried out in relation to Agile software development. Dingsøyr et al. concluded the following: “After an initial spurt of studies on eXtreme Programming, the academic community seems to have turned its attention to Scrum” (Dingsøyr, Nerur, Balijepally, & Moe, 2012).

Jeff Sutherland and Ken Schwaber (Schwaber & Sutherland, Scrum Guide, 2016) describe Scrum as a framework that can be used to address complex adaptive problems and to manage complex product development (fig. 4). It is based on empirical process control theory and it is based on three pillars: transparency, inspection, and adaption, which are achieved as follows: Transparency is attained when all the participants are using the same terminology defined in the same manner. Inspection is verified when a common definition of “done” is agreed and verified; in addition, stakeholder involvement is high and delivery is frequent, thus ensuring that progress can be corroborated and undesirable outcomes can be identified during an early phase. Adaptation is assured

through frequent inspections during the process to ensure that progress is being made and, if the resulting product appears to be unacceptable, adjustments must be made as soon as possible to minimize any divergence from the desired end-product.



Figure 4 - Scrum process

Scrum teams are self-organizing and are involved in three roles: product owner, Scrum master, and the development team. The product owner is responsible for maximizing the value of the product and the work of the development team. The Scrum master is responsible for ensuring that the Scrum principles are understood and followed by the team and that the development team consists of the Professionals who, on an incremental basis, deliver a potential viable product which meets the agreed definition of “done”.

Scrum depends on the team improving in accordance with five values: commitment, courage, focus, openness, and respect. The adherence to these five values will maintain its reputation and that it is successful. Scrum events are time-boxed meaning that a fixed period of time is allocated in each activity; this means that the event is finished when the result is met or when time is up. Thus, this means that development proceeds in sprints, which are time boxed between one and four weeks. This keeps the focus on the delivered product and keeps complexity and risk low.

2.1.1.3. Kanban

Kanban focuses on the capacity within the team and adjusts the work in progress (WIP) according to this capacity. This creates more flexible planning options for the team, faster output, clearer focus, and transparency throughout the development cycle.

The work of the teams is placed on a Kanban board and is used to visualize the work and to optimize the flow of the work among the team members. The basic Kanban board consists of a three-step workflow: “to do”, “in progress”, and “done”. The board may vary based on team size, structure, or objective.

The team focuses on the work in progress and, when ready, picks the most important piece of work to carry out from the “to do” list. The product owner prioritizes this list, ensuring that the team always goes for maximum customer-valued work. Unlike Scrum, Kanban has no fixed iterations. The work is done when it’s done. The lead time (time needed to complete work) depends on the skills within the teams. This can be controlled by ensuring that there are unique and irreplaceable skills within the team.

2.1.1.4. [Agile software development](#)

The success of Agile software development can be encapsulated by the three factors that guarantee the success of a project—reduced time, reduced costs, and increased quality. In addition to these success factors, two more factors/categories have been introduced by Subhas Chandra Misra, Vinod Kumar, and Uma Kumar. These categories are: organizational factors and people factors (Misra, Kumar, & Kumar, 2009). In their research, they found nine factors which have a significant relationship to success:

- Customer satisfaction
- Customer collaboration
- Customer commitment
- Decision time
- Corporate culture
- Personal characteristics
- Societal culture
- Training and learning

Customer collaboration and customer commitment are found to be very important, and are the two factors that drive the development teams, since they want close customer collaboration in order to keep the customer closely associated, engaged, and committed to the project. The development team is trying to satisfy the customer by developing software efficiently.

One advantage of Agile is speed and another success factor is “decision time”. The fact that Agile software development is fast and iterative enables important decisions to be made quickly, thus contributing to its success.

An important success factor is the corporate culture. Creating a secure environment that fosters supportive management, that has all stakeholders involved, that removes politics from the scene, and that promotes good customer-vendor relationship within the organization ensures that the team is adaptable to change.

Social culture and personal characteristics are important factors for success. When creating a team, managers should include people who are communicative, dynamic, progressive in attitude, and who share a similar social culture.

In terms of training and learning, it was concluded that the best contribution to success was to encourage continuous learning within the team by their training each other. The team members should be helped by mentoring and by creating an open space for discussions.

These success factors are also described by Tsun Chow and Dac-Buu Cao (Chow & Cao, 2008) in their survey study on critical success factors in Agile projects. In their study they found the following contributed to success:

- A correct delivery strategy
- The proper practice of Agile software engineering techniques
- A high-calibre team

Three additional factors that have been identified as being critical to enhancing success are:

- A good Agile project management process
- An Agile-friendly team environment
- Strong customer involvement

Although Agile software development is popular with practitioners, there is no specific reason as to why. Torgeir Dingsur et al. (Dingsøyr, Nerur, Balijepally, & Moe, 2012) concluded in the examination of publications and citations that the transformation delivered by the Agile Manifesto was remarkable. All the different methods, tools, techniques, and best practices have been accepted by practitioners around the world, who have developed a diversity of methods. The Agile Manifesto has been applied to XP,

Scrum, Lean Software Development, FDD, and crystal methodologies, and so on. Every method claims to follow the core principles of the Agile Manifesto (Dingsøyr, Nerur, Balijepally, & Moe, 2012).

2.1.2. Agile or agile

In this thesis, Agile has usually been capitalized. The Agile community speaks of “Agile” and “agile”. Agile with a small letter (usually “agility”) refers to the usual English adjective of working in a fluid, quick and responsive manner. However, this thesis principally deals with Agile methods based on Scrum frameworks, and thus the capital letter been predominantly the usage of choice.

ag·ile
<i>adjective</i>
1. Characterized by quickness, lightness, and ease of movement; nimble.
2. Mentally quick or <u>alert</u> ; <i>an agile mind</i> .

Source 1- <https://www.thefreedictionary.com>

This report focuses on Agile as being the changes that must be made in order to make an organization more flexible.

2.1.3. Distinction between method and frameworks

During the interviews, the respondents alternated between mentioning frameworks and methods to explain their way of using Agile in the organization. Some explicitly mentioned a framework or method to describe a specific behaviour. To be consistent in this report, I will use the definitions as described by van Haren publishing (Verbrugge, 2018). A framework is described as follows:

A framework is an entity between a ‘model’ and a ‘method’. A framework is, or contains, a (not completely detailed) structure or system for the realization of a defined result/goal. Many frameworks comprise one or more models, based on the modelling techniques mentioned above and often based on (best) practices. Compared with methods, frameworks give the users much more freedom regarding the (partial or entire) use of the framework and the use of the models or techniques therein (Verbrugge, 2018).

A method is described as:

A method is a systematic approach to achieve a specific result or goal and offers a description in a cohesive and (scientific) consistent way of the approach that leads to the desired result/goal. Minimally a method consists of a way of

thinking and a way of working. Possible additional components of a method are: management model(s), presentation model(s), support model(s) (prescriptions, instructions, tips, examples, etc.), based on the modelling techniques mentioned above. The meanings of the terms 'practice' and 'model' are much broader than the term 'method' (Verbrugge, 2018).

2.2. Agile in other domains and organizational departments

The literature research revealed that an Agile way of working is described and studied in domains outside of IT and is summarized in the following sections: manufacturing (2.2.1), marketing (2.2.2), sales (2.2.3), education (2.2.4), healthcare (2.2.5), finance (2.2.6) and Human Resources (HR) (2.2.7).

2.2.1. Manufacturing

Manivelmuralidaran (Manivelmuralidaran, 2015) found that Agile manufacturing is different from traditional manufacturing. Agile manufacturing concentrates on customer enrichment and competitiveness through cooperation. Because software developers in general are higher educated and trained, Agile manufacturing could integrate people, information, and technology in the same team.

Organizational needs are described by Manivelmuralidaran as:

A wide range of knowledge which addressed all dimensions of the system including organization, people, technology, management accounting practices, etc. Most importantly the inter-related nature of all these areas needs to be recognized and an interdisciplinary manufacturing system design method must be adopted as standard practice (Manivelmuralidaran, 2015).

This can be explained as the next step in developing the multidisciplinary approaches that professionals are currently using.

Manivelmuralidaran mentions four transitions that must be present during any efforts to achieve Agile manufacturing. These transitions are:

- An examination and definition of the underlying conceptual framework on which Agile manufacturing enterprises will be built
- An exploration and comprehension of the nature of the mass production paradigm and the nature of the cultural and methodological difficulties involved in the transition to Agile manufacturing

- A definition of a methodology for designing a 21st century manufacturing enterprise
- An understanding that Agile manufacturing is based on a systems perspective of technology, organization, and people, and tied to clear business visions and goals

In their article, “Agile manufacturing: Relation to JIT, operational performance and firm performance,” R. Samuel Saleb, Kenneth W., Green Jr. and Dwayne Whitten (Samuel Saleb, Green, Whitten, & Green, 2011) concluded that:

In the manufacturing sector, Just in Time (JIT)-purchasing combined with JIT-production enhances a firm’s manufacturing agility. Improved manufacturing agility leads to the improved operating performance of the firm, which in turn leads to the improved marketing and financial performance of the firm (Samuel Saleb, Green, Whitten, & Green, 2011).

2.2.2. Marketing

Marketing is another area where Agile ways of working have had an impact.

This has been confirmed by such people as Claire Drumond (Drumond, 2016) from Atlassian Software, who wrote in a blog on her company website: “Marketers are constantly seeking ways to be faster and nimbler, especially as social media, content, and digital marketing technology have changed the way they’ve traditionally gone to market. The days of executing static campaigns planned months in advance are gone (Drumond, 2016).

Marketing has adopted Agile ways of working because of faster feedback from the customer and the fact that the end product is improved in a very short space of time.

Marketing is a domain where an alternative manifesto, based on Agile principles, has been formulated. This manifesto is based on previous published marketing manifestos (Ewel, et al., 2018).

2.2.3. Sales

Introducing Agile into the sales domain has had some surprising results. This has been presented by Rini van Solingen, Jeff Sutherland, and Denny de Waard (van Solingen, Sutherland, & de Waard, 2011) at the 2011 Agile conference in Salt Lake City. They introduced the Agile way of working into the sales domain and found some surprising

results. They concluded in their research three findings applicable when Agile is introduced into the sales domain:

- Sales are much more predictable than expected. Cause and effect become visible when using Scrum.
- Scrum as the sales best practice allows the sales teams transparency into the full sales process and helps them realize the impact of sales on other company divisions.
- Scrum showed how maintaining relationships and referrals are vital in sales.

Agile is useful when seeking to create a clear picture of the needs of the customer. The feedback received when Agile ways of working have been applied is that Agile gives information on how to improve client focus and give sales people gain an insight into their behaviour in the relation with the client so they can become more effective (Steenberg, 2016).

2.2.4. Education

Agile is also slowly claiming a position in education. Grigori Melnik and Frank Maurer describe in their paper the experiences they have had with introducing Agile in the classroom (Melnik & Maurer, 2003). Introducing the Agile way of working at schools has two advantages: It prepares students to be flexible when they start working on assignments in the software industry. This means that schools must be open to change and prepare everyone for this new emerging demand from the industry (Melnik & Maurer, 2003). Second, it gives teachers important feedback on the progress students are making.

However, roles in the classroom differ from the roles on Agile teams. In class, the teachers act as product owners and Scrum masters who provide the backlog. The work of each team is reviewed at the end of each sprint by the teacher, who also provides the feedback as well (Cubric, 2013).

The above has also been demonstrated in the research of Christoph Johann Stettina, Zhao Zhou, Thomas Bäck, and Bernhard Katzy (Stettina, Zhou, Bäck, & Katzy, 2013). They found that the Agile way of working in education leads to a more mature, practical, and academic standards because of an iterative coaching routine. By shortening and at the same time intensifying the coaching, students become more involved. They also found that coaching in teams provided a higher information exchange and student satisfaction

in contrast to the bit of extra effort that was needed. (Stettina, Zhou, Bäck, & Katzy, 2013).

2.2.5. Healthcare

There is little literature published on the application of the Agile way of working in healthcare. The one article that this research made use of, which was on the Scrum Alliance website, pointed out the efficacy of implementing Agile, and described how a family practice in the southeastern United States was transformed by adopting an Agile method of continual learning and adaptation (King & King, 2018). King gives an example of how Scrum was applied to a family practice and how it maintained and improved the skills of doctors, nurses, and medical assistants. The transformation was documented by measuring clinical skills at the start of the application of Agile and then demonstrated what progress had been made through an iterative development of those skills. The improvements were demonstrated to doctors, who gave feedback on the presentation telling them about how their skills could be developed.

A very powerful example which can be given about the efficacy of applying Agile to healthcare can be found in the Netherlands. A home care organization called “Buurtzorg” is a Dutch healthcare organization which was founded in 2007 and has now grown to more than 8,000 nurses delivering care to approximately 70,000 clients nationwide. The nurses have been organized into small teams (maximum 12 nurses per team) and are supported by handheld technology that simplifies the complexity of the daily routines (KPMG Healthcare, 2014). The process used has similarities with the Agile way of working (fig. 5).



Figure 5 - Schematic presentation of the Buurtzorg way of working

(Source: http://buurtzorg-services-japan.com/wp-content/themes/buurtzorg/images/service/img_service03.jpg)

The team starts with an assessment of the clients’ needs; these are matched with the nurse’s needs, accepted by the team, and assigned to one or two nurses. When the

team grows up to 12 nurses, they split up in two new teams. Two nurses are responsible for 6 to 8 clients. Coaches are available to support the teams and to solve problems. Every other week, the team discusses and reviews cases and problems. Some team members have specific expertise, such as “dementia care”. The teams are self-supportive and responsible (Gray, Sarnak, & Burg, 2015).

2.2.6. Finance

The results were minimal in the search for literature on the application of Agile in the financial domain. There is an enormous amount of documentation available on applying the Agile way of working within financial institutes, but most material is based on the IT used by financial organizations.

This section of the thesis explores which Agile methods are used by finance departments. One blog article has been found, which was posted in September 2011 by Christine Hegarty (Hegarty, 2011) from Scrum Inc. She describes how Agile was applied during the synchronization of an organization’s financial obligations, and potentially involved such things as bank statements (arriving monthly) and taxes, which are submitted quarterly and yearly. There was no follow-up on the experiences that had been described (Hegarty, 2011), despite a request being made by an unknown interested individual who asked for more information on 24 May 2013. The only follow-up that has been provided is by Jeff Sutherland, who stated that applying the points Hegarty made in her blog revamped the financial system. The velocity increased and finance now probably takes 25% of the effort it used to. No references were provided as to which department or domain was the object of this study.

2.2.7. Human Resources

The search for literature about the application of an Agile way of working in the domain of Human Resources yielded minimal results. One article on “How HR teams can benefit from Scrum” was posted in 2013 by SCRUMstudy on their website. It describes a way that Agile, specifically Scrum, can be applied in the HR department (SCRUMstudy, 2013²). The post has no references to examples or to other literature. The described way of working is mainly Scrum-based, as described in the Scrum guide.

Another article that was identified described why HR must embrace the Agile way of working. Because HR works in yearly or quarterly cycles, this way of working is becoming

² <https://www.scrumstudy.com/>

an obstruction for organizations who are adopting the Agile way of working (Gothelf, 2017). The author also states that there is very little literature on Agile within the HR domain. At the end of the article, there is advice as to how to introduce Agile into the HR community. The suggested starting point is holding bi-weekly retrospective meetings. This short iteration helps to improve processes and motivates staff to initiate change by giving and receiving ideas and feedback in a quick manner.

2.3. Theoretical views on Agile management practices: Change management and knowledge management

To transform an organization to a new way of working, change is needed. These changes are sometimes small, but the results can be enormous. For an organization transforming itself from a “waterfall” business model into an Agile way of working, the change is considered huge. To guide everyone who is involved in changing from old to new ways of working, change management strategies are needed.

Sridhar Nerur, Radhakanta Mahapatra, and George Mangalaraj (Nerur, Mahapatra, & Mangalaraj, 2005) conclude that a shift towards an Agile organization is a change from autocratic management to leadership and collaboration. Organizations which make the transformation become responsive and flexible. Focusing less on paperwork/documentation and more on Lean approaches, transforms knowledge in Agile organizations into tacit knowledge. This can be done by focusing on knowledge management, which is becoming vitally important for Agile organizations. This change creates a major shift and requires adaptation to changed work procedures, tools and techniques, communication channels, problem-solving strategies, and the roles people play in support of the new, flexible way of working (Nerur, Mahapatra, & Mangalaraj, 2005).

This research did not test the model itself, but examined how the process of change had been implemented. The Triade Model of Theo Poiesz (Poiesz, 2014) was applied and formed the basis for the way teams or organizational change had occurred. Since the change to an Agile way of working principally involves changes in behaviour, this model was a good choice because it focuses on the application of the following three pillars of behaviour:

- Motivation:** An examination of the extent to which an individual is prepared to reach the set objective or shared interests to achieve a particular behaviour.
- Capacity:** An analysis of the availability of the quality, skills, or instruments that are required to achieve specific behaviours.
- Opportunity:** An enquiry as to which existing conditions promote or hinder specific behaviours. These factors stipulate whether and to what extent the behaviours can be changed.

The Triade Model suggests a multiplicative relationship between the three factors (fig. 6). Theo Poiesz concluded that the three components must be altered at the same time to achieve the desired affects and to ensure that the individual experiences change as a flow. This directly impacts individual behaviour, which has to be altered when an Agile way of working is deployed.

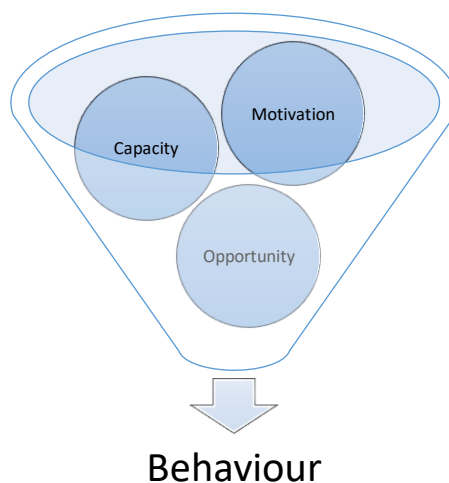


Figure 6 - Triade Model

2.3.1. Organizational view

This research examined the methods used in non-IT domains that have made or that are still in the process of making the transformation towards an Agile way of working. It became clear that change should be implemented throughout an entire organization. For example, product development is currently carried out in most organizations with the help of project management. Project management carried out in a traditional manner involves control over budgets, schedules, and scope. When projects are implemented in an Agile manner, the focus is on achieving business value, with questions about budgets and schedules becoming secondary issues (Fernandez & Fernandez, Winter 2008/2009).

By adapting Agile methods of working and shifting the way development is managed, change takes place on the organizational, team, and individual level.

To focus on change management methods, this research made use of the models and approaches to organizational change as defined by Esther Cameron and Mike Green (Cameron & Green, 2015). In this model, organizations are classified according to four metaphors taken from Morgan's organizational metaphors. These metaphors are listed (tab. 2), which helps to identify the kind of organization that is involved and thus the specific change methods that must be applied in order to organizational shifts to be made:

Machine	The designed end state can be worked towards. Resistance must be managed. Change needs to be planned and controlled.
Political system	Changes must be supported by a powerful person. Change needs a powerful coalition behind it. Defining who are winners and losers is important.
Organisms	Change is adaptive. Individuals and groups need to be psychologically aware of the "felt need" for change. The end state can be defined and worked towards.
Flux and transformations	Change cannot be managed; it emerges. Managers are part of the system, not outside the system. Conflict is useful. Managers enable good connections to be made between people.

Table 2 - Reprinted from: (Cameron & Green, 2015) Organization metaphors used in change management

Changing the culture and mindsets of people is not easy and takes time. To alter an organization's culture, a change strategy should be chosen. Cameron and Green developed a cultural framework (fig. 7) (Cameron & Green, 2015) which can assist an organization to decide which strategy is best to follow when moving from one culture into another.

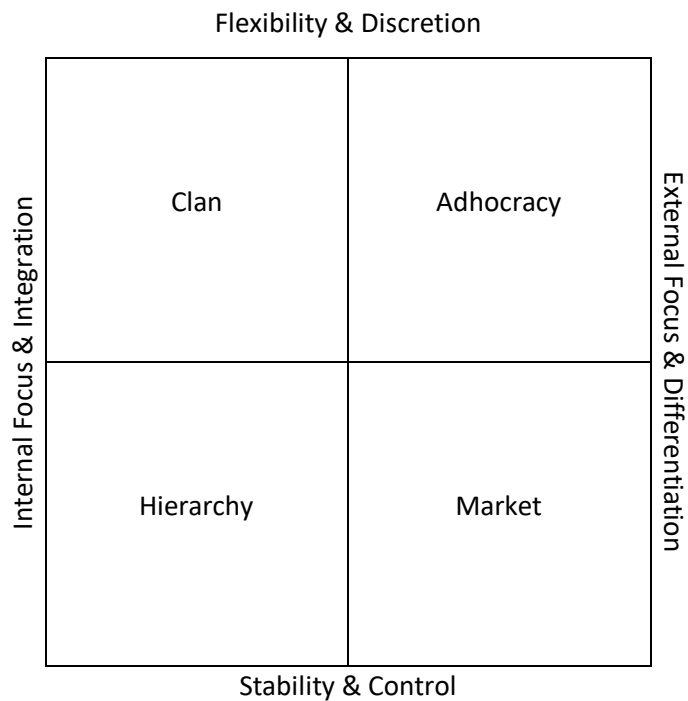


Figure 7 - Reprinted from (Cameron & Green, 2015) *Organizational cultures*

By knowing the current, prevailing culture and the culture the organization desires to achieve, needed interventions can be identified to make the shift from one culture to another.

In addition to changing an organization's culture, there will be other outstanding issues that will have to be solved. Sridhar Nerur, Radhakanta Mahapatra, and George Mangalaraj (Nerur & Balijepally, 2007) found in their research a set of key issues (tab. 3) that would arise when the shift to an Agile way of working was taking place. Despite the fact that they looked at issues involving software development, their findings are applicable since they have to do with what happens in the organizational domain. The challenge to implement Agile is bigger and more problematic in bureaucracies and informal organizations than it is in organizations that are open to innovation.

Management and organizational
• Organizational culture • Management style • Organizational form • Management of software development knowledge • Reward systems
People
• Working effectively in a team • High level of competence • Customer relationships—commitment, knowledge, proximity, trust, respect
Process
• Change from process-centric to a feature-driven, people-centric approach • Short, iterative, test-driven development that emphasizes adaptability • Managing large, scalable projects • Selecting an appropriate Agile method
Technology (Tools and Techniques)
• Appropriateness of existing technology and tools • New skill sets—refactoring, configuration management, units

Table 3 - Reprinted from (Nerur, Mahapatra, & Mangalaraj, 2005) - Key issues in migrating to Agile

2.4. Knowledge management

Using the perspective of knowledge management, this section looks at how Agile methods of working have performed over the last few decades and examines the current ways organizations are working with Agile.

In the article “The new new product development game”, Takeuchi and Nonaka (Takeuchi & Nonaka, 1986) explicate the principles inherent to a holistic approach in product development. By using this approach, organizations demonstrate that they are prepared to meet competitive requirements. The authors observed the development process which was unfolding in several organizations in the United States and Japan, and found that several factors were present when the development process was successful. These success factors have been refined to six characteristics (tab. 4) that are key to managing new product development processes.

#	Name	Short description
1	Built-in instability	Management creates tension (instability) in the team by setting a broad goal or general strategic direction.
2	Self-organizing project teams	A broad diversity of members specifically chosen to be part of the team must and can organize themselves; they will set targets to meet the goals or the directions set by management.
3	Overlapping development phases	Using overlapping development phases, the teams merge when the semi-finished product is transferred from them onto another team. This creates a shared responsibility.
4	"Multilearning"	Learning across multiple levels (individual, group, and corporate) but also across multiple functions takes place. Team members have to learn about adjacent techniques, technologies, and functionality.
5	Subtle control	Management, by promoting self-control and fostering a servant environment where people are carefully picked, can create the following conditions: an open work environment, evaluation and reward-based group performance, the management of differences in rhythm of the development process, an environment that tolerates mistakes and that encourages suppliers to become self-organizing; in this way, management is involved enough to present the team from going into chaos.
6	Transfer of learning	Create moments where knowledge can be shared and restructure teams after completion (without weakening them) helps to share the knowledge gained within the organization.

Table 4 - Six characteristics for managing new product development process (Takeuchi & Nonaka, 1986)

The authors provide a new approach with examples and methods that serve as a handle, which then can be used as a game changer.

Ken Schwaber, in his article, "The Scrum development process", (Schwaber, 1995), referenced several articles, including the article of Takeuchi, "The new new development process" (Takeuchi & Nonaka, 1986), thus confirming the importance of the ideas put forward by Takeuchi and Nonaka. In his article, Schwaber introduced a development process called Scrum, which claimed to be the solution for increasing flexibility and being responsive to requirements, even if they are (re)defined during the development process.

Scrum is defined as a form of black box process management that uses the known project roles defined by the Object Management Group³. The main purpose of Scrum methodology is management, enhancement, and maintenance for an existing product or system. Scrum tries to solve several problems posed by a growing complex environment

³ Object Management Group® (OMG®) is an international, open membership, not-for-profit technology standards consortium, founded in 1989 (source: <http://www.omg.org/about/index.htm>)

by describing an emerging set of environmental variables (tab. 5) that provide complexity.

Availability of skilled professionals	Domain expertise	Time/ funding
Stability of implementation technology	New features	Other variables
Stability and power of tools	Methodology	Effectiveness of methods
Competition		

Table 5 - Variables in a complex environment

Although several attempts were made, no real answer has been presented on how to manage these variables in such a way that results become more readily predictable, that risk is lowered, and that the development process is better defined. Several methods were developed to deal with these issues, but all have their downside. The “waterfall method”, which is a more structured, less flexible, and less iterative process is not good at responding to unexpected changes. The spiral methodology is based on iterations “spiraling” through the phases (determine objectives; evaluate; identify and resolve risk; develop product; and plan next phase) of development. Each phase is built on a small waterfall process. Although the spiral process provides some flexibility, it is still based on linear development processes. The iterative methodology adds risk controls in order to deliver a more predictable outcome, but due to the stiffness and inflexibility of the development process, unpredictable behaviours occur throughout the development process.

In spite of the complex and complicated process, Scrum delivers the needed flexibility and preferred control within the development process. This development process is in itself unpredictable, but control mechanisms have been embedded to control this unpredictability. This is done by defining the deliverables iterative and by evolving them during the project, thus responding to the changing environment. Thus, the Scrum approach uses three phases: pregame, game, and postgame. During the game, the development is done in sprints built on the variables of time, requirements, quality, cost, and competitiveness. The interaction among these variables determines the end of the phase.

During the pregame phase, there are two products to be delivered. First, the new release is set within the context of the currently known backlog and, second, the development is placed in the system’s architecture. During the postgame phase, the release is prepared, final documentation is finished, and all is tested and released. Every sprint has a review moment where the whole team looks back and examines

functionality, the system, and the changes made to the backlog. Based on this review, new items can be put on the backlog, which changes the content and direction of the deliverables.

The development process is controlled by using loose controls such as: the backlog, release enhancements, packets, changes, problems, risks, solutions, and issues. These controls are used in different phases of development. The team is a small group consisting of developers, documenters, and quality-control staff. The team defines the backlog and manages all the problems during the sprint. Team members are selected for their knowledge and expertise on the packages and not on their domain competence. Product management is described as management controlling the deliverables. If these measurements and controls are not used correctly, the results become unpredictable, which makes Scrum ineffective. Scrum is defined as an empirical method, meaning that there is a critical need to introduce measurement and controls because the development process is very loosely defined.

The advantage of applying Scrum is that it provides flexibility in terms of planning product releases and, in parallel, in terms of managing the variables as the project advances towards completion. Tacit knowledge is shared within the small teams during sprints, and developers are free to create surprising solutions as they learn.

The current application of Scrum is based on the thoughts of Ken Schwaber and the Agile Manifesto. When the Scrum methodology is viewed against its origins, it is clear that it originated from the work of Takeuchi Nonaka, a fact that leads to some interesting conclusions.

Both authors focus on an iterative and overlapping approach to creating flexibility. Both are working with self-organizing teams, which are set up in a way that encourages tacit knowledge, which they derive from available explicit knowledge (measurements and documentation from previous sprints). Where Nonaka focuses on maximizing available knowledge as a means of providing the success factors during the development process, Schwaber focuses more on controlling the process, on team design, and, to a lesser extent, on the rituals to be used. What is interesting is that the Agile Manifesto with its twelve principles does not focus on these items. An examination of the Scrum Guide (Schwaber & Sutherland, 2016), which is mentioned by almost all the participants in our study, shows that this guide focuses on the roles, events, artifacts, and even the rules that bind them together.

Agile organizations are constantly delivering and checking on how they can improve their performance, which means that Agile becomes a way for them to become organizations that learn. This becomes clear when one realizes that retrospection is an important factor in becoming proficient in Agile. Current applications of Agile start by altering the way Scrum and other methods are implemented. An important step that must be taken during the alteration of the work processes is for the organization/people working Agile to understand what skills are required, and then for them to master them before altering them in accordance to defined needs.

This process is described by a five-stage model created by Dreyfus and Dreyfus (Dreyfus & Dreyfus, 1980), and describes the stages involved in developing from being a novice to becoming an expert. When organizations achieve mastery, they are capable of approaching a problem in a holistic way because they are able to monitor their surroundings and are capable of analyzing the complexities of the changing environment in which they operate. Although our research did not look at the success rates of the cases presented by the participants, they did report the existence of failing implementations of Agile. If learning is applied too quickly, this could lead to demoralization, which could then lead to a lower learning curve. This means that an organization not fully implementing Agile cannot become fully competent and therefore they are not completely proficient. These organizations are known for partially engaging in Agile-related tasks (“doing Agile”) instead of growing towards a mastery level and becoming Agile.

2.5. Organizational routines

Organizational routines are important for creating a foundation on which the team(s) are built. In addition, when teams are adapting to an Agile way of working, organizational routines become an important asset.

Organizational routines are repeated patterns that do not often change over time. These routines are adjusted, for example, when an organization, department, or team decides to adopt the Agile way of working. Then, some or all of the organizational routines will be altered. In Agile organizations or teams, the organizational routines depend on the method being applied. Each method involves a set of rituals intrinsic to that method. Strode (Strode, 2006) found that, although each method was different and applied its own ways of planning, managing, evaluating, and controlling the iterations, all the methods shared some properties in common. Strode (Strode, 2006) described the

properties of the rituals as “incremental and iterative development, projects undergoing constant change, active user involvement, feedback and learning, frequent meetings, daily is optimal, etc.”.

Feldman (Feldman, 2006) stated that the routines did not alter much, but that the people involved in routines altered those routines to execute work in a way that best suited them. This response is also applicable to Agile teams. People who are involved in an Agile way of working start with adopting an Agile method, which will then be transformed over time to better fit their way of working. Feldman found that a characteristic of organizational routines is the potential for the dynamics to shift if the routines and the thoughts and reactions of people who are using the routines shift (Feldman, 2006). Since this study examines the way organizations adapted the Agile way of working, it will also analyze the changes organizations made to the routines being used.

3. Methodology

This chapter describes the methodology of this research and the design and data used in this study. Section 3.1 of Chapter 3 describes the research strategy and design. Section 3.2 focusses on the research process. Section 3.3 presents the case selection strategy. In the last section (3.4,) the data collection method is described.

3.1. Research strategy and research design

The purpose of this study is to contribute to the understanding of the influence of Agile in non-IT domains and how organizations have been inspired by how Agile has been used in the IT world. The application of an Agile way of working has just started making progress in terms of its moving out of the IT domain. As a result, there is no or little scientific research available on this subject.

To gain a better understanding on this subject, this research looked at the choices available and how they played a role. To demonstrate the connection between real-world observations and scientific research, Jonker and Pennink's "Box of bricks of research" (Jonker & Pennink, 2010) was used (fig. 8) as a guide to how scientific research should be carried out. This helped in establishing the appropriate research behaviours and approaches.

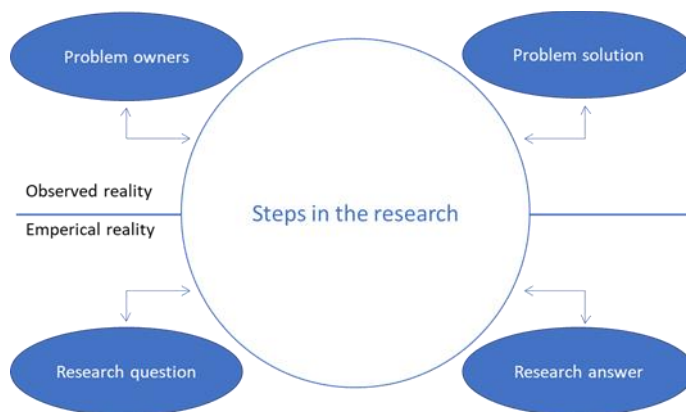


Figure 8 - Box of Bricks of research (Jonker & Pennink, 2010)

This visual helps to define the research design, and has been used to guide and utilize a scientific approach, one which makes a clear distinction between observed reality and empirical reality.

To assist in designing research, Jonker and Pennink present the research pyramid (fig. 9). This is a tool used to assist in the choices that have to be made during the conduct of research. On each level, different questions must be answered. By moving from the top

down, the research design will change from the abstractions at the top to very concrete items at the bottom of the pyramid.

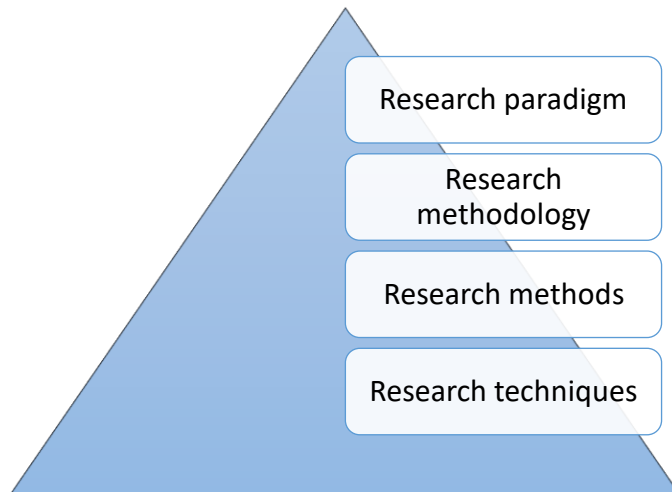


Figure 9 - Adapted from (Jonker & Pennink, 2010) - The research pyramid

3.1.1. The research paradigm

The subject of this research involves a new environment where not much knowledge is available. There are several possibilities as to how the research should be conducted. The basic approach is based on the way the researcher looks at the subject. These are positivism and interpretivism. This study adopted and apply the interpretivist philosophy.

Since the approach of choice is interpretivism, the research that was carried out examined the differences between humans as social actors. This approach makes it possible to look at the research subjects in a way that enables an understanding to take place of how the Agile way of working has been implemented and what motives underlie the observed behaviours. The aim of the approach is to view the world of the subjects studied and to understand how they apply the Agile way of working.

The subject of this study has not been extensively presented in scientific publications. Most of the information can be found on websites or other sources that can be subjective and biased by commercial concerns. This means that observation was a key tool that was used to acquire credible data and facts. Alongside observation, an interpretivist approach was applied during the research. I wanted to observe the way teams have applied the Agile way of working outside of IT. This gave me the ability to focus on causality and on principles such as generalizing, which means that one reduces a phenomenon to its simplest elements. This can be done in three principle ways (Saunders, Lewis, & Thornhill, 2009); in this study, I have chosen to interview experts.

One basic approach could involve following a positivist philosophy, whereas in this study, an “observation of social reality” was applied during the process of answering the research question. To stipulate which approach the organizations used and the attitudes they adopted when they applied the Agile way of working could be studied using the positivist philosophy. The problem I expected to encounter was that this would provide answers, but would not provide scientific proof. There is not enough knowledge available on the subject to begin with a theory in mind.

3.1.2. Research methodology

I chose to use an interpretivist research approach, a research method that can be used for testing or building a theory (Saunders, Lewis, & Thornhill, 2009). Because there is little information found on the subject, the study applied an inductive method to investigate the question. As described by Easterby-Smith (Easterby-Smith, Thorpe, Jackson, & Lowe, 2008), the application of such a method involves the following:

Research using an inductive approach is likely to be particularly concerned with the context in which such events were taking place. Therefore, the study of a small sample of subjects might be more appropriate than a large number as with the deductive approach. Researchers in this tradition are more likely to work with qualitative data and to use a variety of methods to collect these data in order to establish different views of phenomena.

The research reported on here was based on a grounded-theory design and enabled organizational phenomena within teams that were using Agile as way of working to be studied. It has been demonstrated that the grounded theory design can be used to study business and management (Goulding, 2002). This approach helps a researcher to explore a specific phenomenon, in this case, the application of an Agile method of working. The results were used to answer the overall research objective, to recognize the important issues involved, and to find the best practices that could be used when Agile is applied within non-IT organizations.

3.1.3. Research technique

Each task was based on data that had been collected during the research. There were several sources that were used to collect the evidential basis needed for analysis.

Data collection can be performed in several ways. Yin (Yin, 2009) states that the collection of exploratory evidence can be done by using six sources of evidence, all of

which have their own pro and cons. To gain insights into the research question, Yin (Yin, 2009) mentions four sources that can be used, which are interviews, direct observation, participant observation, and physical artifacts. All have their strengths and weaknesses.

This study has picked interviews as the principle data-collection technique. Interviews, which provide insights and personal views, are a source of reliable evidence in relation to answering the guiding question that is being investigated. In addition, interviews provided information of direct relevance to the topic being studied and, given the limited timeframe, were the best method to be used.

3.2. Research process

The coding technique that was used was based on the qualitative research method described by Strauss and Cordin, who provide guidance on the steps that should be followed to come to a new theory on the basis of qualitative data (fig. 10).

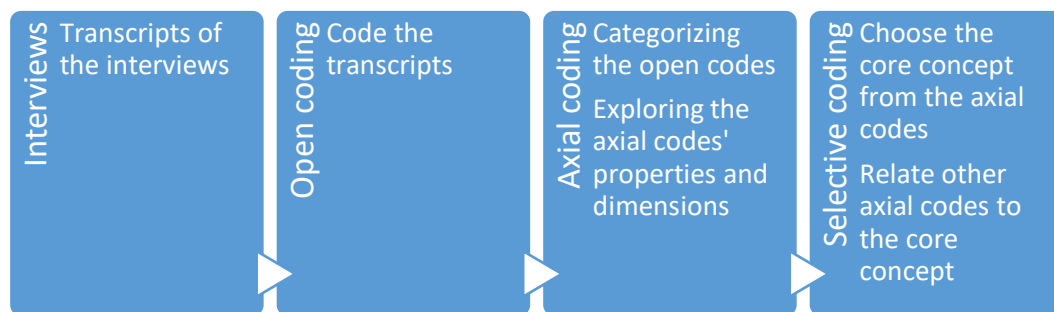


Figure 10 - Qualitative study coding process

3.2.1. Initial phase

In the initial phase, the research question was formed and was followed by extensive research into the available literature. The main goal was to acquire knowledge of the Agile way of working. This was done by analyzing the available literature on the history of Agility. During the literature-review phase, the principle focus was on the history of the application of Agile methods of working.

3.2.2. Interviews

Interviews were conducted after the initial phase. The interviews were held in a semi-structured way, and this approach was applied in order to learn more about the subject by using the iterative process. All participants were selected because of their experience in implementing an Agile way of working outside of IT. The background of the participants varied from marketing to education.

The interviews were held using a pre-structured set of questions, which were divided into four sections. The first set of questions were formulated in a manner that would create rapport and encourage the person being interviewed to provide some basic information. The second section of questions focused on how the organization or department concerned began changing to an Agile way of working. The third phase zoomed in on the method the organization/department used to become Agile and explored which specific routines or rituals had been applied. The fourth and final part of the interview gave the participants room to reflect on their experiences in the application of Agile methods of working in the department or organization.

3.2.3. Grounded theory approach

This study has been based on explorative research that sought to find and present answers to the guiding questions, and so interviews were conducted to collect the relevant data. Thirty-seven people from 22 different organizations were approached. All individuals were chosen on the basis of whether they had experience in applying Agile methods of working outside of the IT world. In total, 19 people were interviewed. One participant was excluded from the results because the interviewee had only theoretical, but no practical knowledge in applying Agile ways of working outside of IT.

All interviewees had the practical experience involving Agile applications outside of IT that was required. Several had experience involving more than one organization. Every interview was recorded as a separate case study and was transcribed for analysis. These cases were then cross analyzed.

3.3. Case selection strategy

The participants were all found via searches on LinkedIn and Google, and were approached by email and requested to answer the following: Were they available for an interview? Did they have experience in applying Agile outside the IT domain and if not, could they provide the name of someone who had had such experience? Several participants provided the names of a number of contacts who also had had experience in applying Agile outside the IT domain.

The participants had had various kinds of experience in different industries and domains with applying Agile methods. All interviews focused on their experience in applying Agile within their organization (with at least one or two clients) or on teams. Each interview is presented as an individual case.

3.4. Data collection

Multiple case studies were chosen in order to collect data, a technique that allowed for the research questions to be investigated in depth and in a real-life context. Interviews were also conducted with experts in the field of applying Agile ways of working outside of IT.

The interviews were conducted in two parts. The first interviews consisted of a pre-study to check if the questionnaire and the presentation of the questions were useful. The first three interviews were held in February, March, and April of 2017.

The second part used an altered questionnaire and was used to collect the data. These interviews were held during the months of April through November of 2017.

3.4.1. Coding

The collected data needed to be coded before it could be used and interpreted. The coding was done by using the process as described by Strauss and Corbin (fig.10), and started with open coding, where the transcripts are coded by word, line, or paragraph. The next step was grouping codes into categories, resulting in axial codes. This process enabled me to group the data, analyze it, and accurately interpret it.

4. Results

This chapter presents the research results, which were based on interviews and the analysis of the collected data. The results are presented both in textual and visual form. Section 4.1 of Chapter 4 introduces the participants. Section 4.2 presents the domains where the Agile way of working was being implemented or applied. Section 4.3 presents the reported frameworks that were being applied. The rituals and motivations that were applied are shown in section 4.4. Finally, in section 4.5, the critical success factors.

4.1. Participants

The participants were selected on the basis of their experiences with Agile as reported on their LinkedIn accounts or when they were questioned directly. The expertise that I was looking for was whether the people in question had either applied Agile methods of working to other domains or whether they had transformed their organizations by applying Agile to non-IT domains. A total of 37 people from 22 different organizations were invited for an interview.

Nineteen people responded and participated in the interviews. The interviews were held face-to-face, by phone, or by Skype (tab. 6). At the start of each interview, the participants were asked for permission to record the interview and they agreed that all responses would be made anonymous. To build trust and create a safe environment for the participants to share his or her experiences without being hesitant or holding (DiCicco-Bloom & Crabtree, 2006) the first questions focused on a personal description of their experience.

The first three interviews were conducted as a pilot, a trial run, and were used to check if the interview setup was complete. Based on the results, several interview questions were changed or added so that better insights could be gained into the research question (Turner, 2010). The first interview questions can be found in the Appendix (9.1) and the final interview questions can be found in section 9.2. Respondent nine replied to the request to participate by stating that he could allocate a maximum of 30 minutes for the interview. Based on experience with previous interviews, I realized this would not be sufficient to ask all the interview questions. This interviewee did not respond favourably to a request for written submissions, and thus the decision was made to alter the questions for respondent nine. The shortened list of questions is added in 9.3.

The participants were identified through a search, via Google, to see if they had made any statements about Agile methods on their websites and on such sites as LinkedIn,

and were asked to participate after it had been ascertained that they had applied Agile (or Agile methods; e.g. Scrum, Kanban, eXtreme Programming (XP)). In addition, I found participants through “word of mouth” referrals (asking some of my professors if they knew of useful interviewees in their personal networks). Finally, I made use of the personal networks of the interviewees, asking them if they could provide the names of other people who met the interview criteria. The participants were all approached via email, and were asked if they would be willing to participate in a 60-minute interview. The interviews took place at a time that suited the participants in order to match their agenda or to take into account the different times zones where the respondents lived.

Pt.	Role interviewee	Experience (years)	Industry application of Agile methods	Domain application	Method
1	Consultant	?	Local government and related organizations	Portfolio management, Finance and control	Scrum
2	Agile coach	?	Financial industry	Marketing	Scrum
3	Agile coach	?	Financial industry	Marketing	Scrum
4	Consultant, Agile coach	10 years	Manufacturing, product development, transportation, Finance	Product development, R&D manufacturing, Product development, Procurement	Scrum
5	Consultant	5 years	Finance	Marketing	Scrum, SAFe
6	HR manager, Program manager	6 years	Energy	E-commerce, Online Sales	
7	Consultant, Writer	> 10 years	Administration		Sociocracy Scrum
8	PhD Student	1 year	Product development, Research	Research project	Scrum
9	Public speaker	> 10 years	Various	Marketing, Sales, Start-ups	
10	Manager: methods, quality, and technology	7 years	Food retail	HR	Scrum
11	Consultant, Writer	> 10 years	Various	Machine manufacturing, Sales and marketing	Scrum
12	Manager Senior product owner	7 years	Financial industry Insurance	Sales Internet	
13	Consultant	7 years	Financial industry	Marketing	Scrum
14	Consultant	9 years	Energy; manufacturing	Geology	Scrum
15	Employee Communication Department	1 year	Social services, Education	Team communication	Scrum
16	Agile coach	5 years	Education	Schools	Scrum
17	Marketing manager	3 years	Travel industry	Marketing	Spotify
18	Consultant Professional user (Scrum Master) Writer	10 years	Telecom Software hosting	Customer Service HR	Scrum
19	Consultant	No interview			

Table 6 - Participants: overview

The participants had had a great deal of experience in applying Agile methods in different companies or domains and were spread worldwide. Although most of the respondents were Dutch, some were not and lived outside of the Netherlands (tab. 7). Nine respondents were working as consultants who were responsible for Agile

implementation. Most had had more than 5 years of experience in applying the Agile way of working, and they had had experience both in and outside of the IT domain. Two interviews, part of the pilot phase, took place within the same organization and within the same domain. One participant agreed to give an interview, but stated at the start that his/her experience on applying Agile methods outside IT was based on hearsay only, not on personal experience. As soon as that statement was made, the interview was concluded.

Continent	Country	Participants
Europe	Netherlands	14
	Germany	2
	Switzerland	1
North-America	USA	1
South-America	Columbia	1

Table 7 - Participants: geographical spread

4.2. Organizational domains found

The participants were approached because they had stated that they had had specialized knowledge with working with Agile specifically outside the IT domain (tab. 8).

Industry	Domain	Role in the organization	Number of participants
Customer Services	Marketing	Agile coach, Scrum master	1
Education	Management consultant	Agile coach	1
Education	Schools	Researcher	1
Education	Schools	Agile coach	1
Education	Communication	Manager	1
Energy	Geologists	Agile coach	1
Energy	Marketing	Unit manager	1
Financial Industry	Marketing	Agile coach	2
Insurance	Marketing	Agile coach	2
Manufacturing	Marketing	Agile coach	1
Public sector	Communication	Agile coach	1
Public Sector	Marketing	Agile coach	1
Public Speaker	Management consultant	Not applicable	1
Retail	HR	Scrum master	1
Transportation	Management consultant	Agile coach	1
Travel Industry	Marketing	Unit manager	1

Table 8 - Industry and domains where Agile ways of working were found

The participation of people from the marketing domain was significant, with 12 participants being active within that domain.

4.3. Agile frameworks applied

Organizations that have adopted an Agile way of working can choose different methods or frameworks to use when doing so. Organizations generally look for the best method, one that suits their needs, when seeking to implement Agile. Several respondents

mentioned that it was important to think about the method chosen when transforming the company to an Agile way of working.

Outside of the IT domain, different methods and frameworks have been used. The interviewees gave several examples of methods and frameworks they were using or have used in the past (tab. 9).

Domain	Used method	# Mentioned
Marketing	Scrum	9
	Spotify	3
	EXtreme Programming	2
	Scaled Agile Framework	1
	Google sprint method	1
	Design Thinking	1
	Appreciated inquiry	1
	Kanban	1
Sales	Scrum	2
Human Resources	Scrum	1
Research & Development	Scrum	1
Procurement	Lean	1
Customer Services	Scrum	1

Table 9 - Frameworks used within the domains discussed

The most used framework was Scrum, followed by the Spotify model. The marketing domain was the most diverse, where eight different methods were mentioned during the interviews. The number of methods mentioned was higher than the number of participants. This is due to the fact that several participants had had experience at more than one organization. They also referred to other implementations and methods that were used.

During the interviews, one area of response that was particularly interesting involved the answers to the methods used and what role those methods played in terms of encouraging the participants to promote an Agile way of working; the methods chosen also motivated them to use the rituals that they did during Agile implementation. The results gave an overview of the rituals (fig. 11, below) used within the organizations.

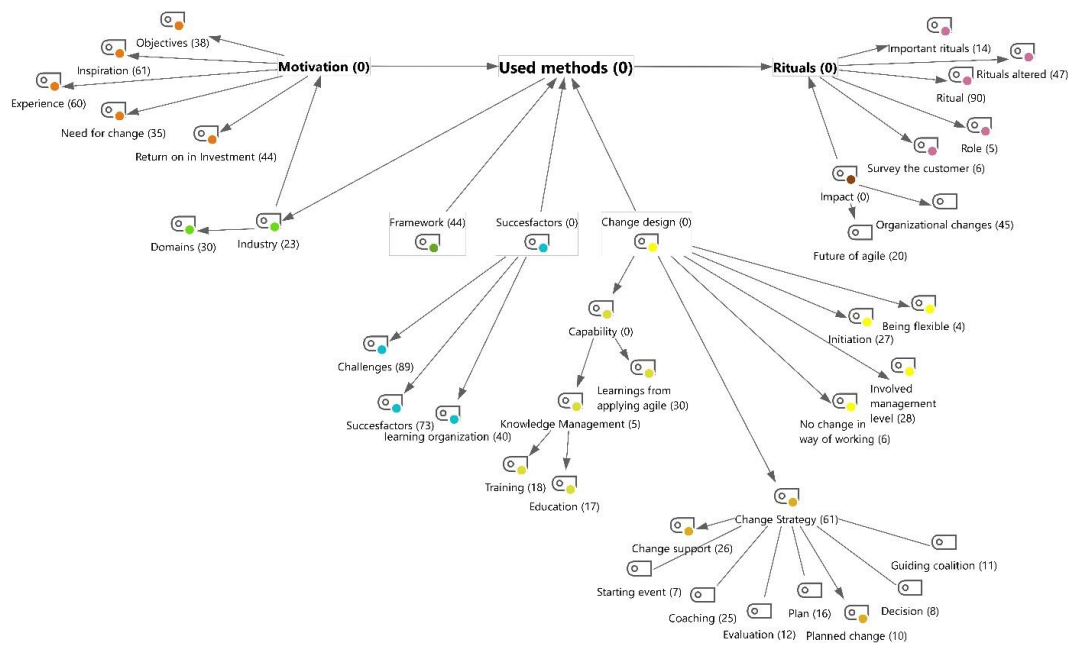


Figure 11 - Graphical overview of rituals used

4.3.1. Reported application of Agile practices and rituals

The interviewees stated they were using methods which consisted of multiple rituals to be performed. In addition, the interviewees described the different rituals they used within the teams when they were applying Agile (tab. 10). If the interviewee mentioned applying “Agile by the book”, the rituals used were marked in red. Individual rituals mentioned are marked in black.

	Sprint frequency	Daily Scrum (Stand-up)	Retrospective	Sprint planning	Sprint review	Backlog	Implement all rituals and adjust to the team	Userstory	Definition of done	Co-located	Scrum Master	Cross-functional teams	Start with Scrum (not mandatory)	Sprint meeting	Optimization	Empowering the team	Knowledge sharing	Roadmap	Working with fun	Product Owner	Weight the shortest job first	Big Event at start Sprint (SAFe)	Value owners
Respondent 1	●	●	●	●	●	●		●	●					●									
Respondent 2	●									●	●	●											
Respondent 3	●		●					●	●	●	●				●	●	●		●				
Respondent 4	●	●	●	●	●	●	●						●										
Respondent 5	●	●	●	●	●	●	●																
Respondent 6	●	●	●	●	●	●	●	●			●												
Respondent 7	●	●	●	●	●								●										
Respondent 8	●	●	●	●	●		●																
Respondent 9																							
Respondent 10	●	●	●	●	●	●		●			●	●		●							●	●	
Respondent 11	●	●	●	●	●	●			●		●	●			●								
Respondent 12	●	●		●	●	●												●					●
Respondent 13	●	●	●				●		●	●			●		●				●				
Respondent 14	●	●	●	●	●	●												●					
Respondent 15	●	●	●	●	●	●	●	●		●										●			
Respondent 16	●	●	●	●	●	●						●					●						
Respondent 17	●	●	●	●	●		●																
Respondent 18	●	●	●	●	●	●	●																
Totals	15	15	15	14	11	8	8	5	4	4	4	3	3	2	2	2	2	2	1	1	1	1	1

Table 10 - List of rituals used, as mentioned by the interviewees
Black used to indicate a specific mention of a ritual. Red is used when the respondent said, “We do Scrum by the book”

Scrum rituals were the most used, since almost all the interviewees stated they use rituals which were identified as belonging to Scrum.

Three interviewees stated that implementation should start with all the available rituals and could be altered later. Eight interviewees mentioned that they first implemented all the rituals and, over time, when the team(s) had mastered those rituals, the team could alter them.

4.3.2. Reported alteration of Agile practices and rituals

The practices and rituals used within the different domains were altered by the teams (tab. 11). The alterations made to the rituals were not equally spread, since every alteration was made for a specific reason. The differences in the alterations made involved the frequency, location, duration, time, utilization, etc.

The interviewees mentioned the daily Scrum ritual as the ritual that was altered the most, and some stated that the rituals used were altered to fit their way of working. The most altered ritual was the one having to do with stand-up frequency, which was changed from daily to weekly. Some interviewees stated that they did not have a fixed

time for the daily Scrum or that the Scrum was carried out by phone (interviewees 10, 13, 14, and 16).

	Daily Scrum (Stand-up)	Implement all rituals and adjust to the team later	Retrospective	Sprint frequency	Sprint planning	Start with Scrum (not mandatory)	Co-located	Shu-Ra-Ree	Sprint review	Teamforming	Backlog	Knowledge sharing	Scrum Master impediment	Mixed methods
Respondent 1														
Respondent 2														
Respondent 3														
Respondent 4														
Respondent 5														
Respondent 6														
Respondent 7														
Respondent 8														
Respondent 9														
Respondent 10														
Respondent 11														
Respondent 12														
Respondent 13														
Respondent 14														
Respondent 15														
Respondent 16														
Respondent 17														
Respondent 18														
Totals	12	8	7	5	5	3	2	2	2	2	1	1	1	1

Table 11 - Practices and rituals altered when applying Agile as stated by the respondents

During the interviews, a further explanation on altering rituals was given. Eight interviewees mentioned that they had started with the Scrum framework rituals without making any changes. After a period of time, the team adjusted these rituals to meet their specific needs. This was further explained by three interviewees (interviewees 5, 6, and 13) as following the Shu-Ha-Ri principle⁴.

4.3.3. Reported application of practices and rituals “by the book”

The respondents mentioned the use of rituals, both as they were given and in an altered form, when they were applying an Agile way of working. The most used method was Scrum. Several of the interviewees responded with the answer: “We implemented Agile by the book”. When the rituals mentioned were examined and after a review of the answers given during the interviews, it was clear that the interviewees meant that they used the Scrum guide and implemented the practices and rituals as described by Jeff Sutherland and Keith Schwaber (Schwaber & Sutherland, Scrum Guide, 2016). The rituals

⁴ Japanese martial art concept, which describes the stages of learning, progressing to mastery.

that stayed the same were mostly Scrum rituals (tab. 12). The red-marked rituals were rituals not mentioned specifically by the respondent, but indicate that implementation took place “by the book”.

	Sprint frequency	Sprint planning	Sprint review	Retrospective	Backlog	Userstory	Definition of done	Cross-functional teams	Daily Scrum (Stand-up)	Scrum Master	Co-located	Empowering the team	Optimization	Roadmap	Sprint meeting	Working with fun	Knowledge sharing	Start with Scrum (not mandatory)	Implement all rituals and adjust to the team	Product Owner	Weight the shortest job first	Big Event at start Sprint (SAFe)	Value owners
Respondent 1	●																						
Respondent 2	●																						
Respondent 3	●																						
Respondent 4																							
Respondent 5																							
Respondent 6	●	●	●																				
Respondent 7		●																					
Respondent 8	●	●	●						●														
Respondent 9																							
Respondent 10	●	●	●	●	●	●																	
Respondent 11	●	●	●	●	●																		
Respondent 12																							
Respondent 13																							
Respondent 14	●	●	●	●	●																		
Respondent 15	●	●																					
Respondent 16																							
Respondent 17	●	●	●																				
Respondent 18	●	●	●	●																			
Totals	10	9	9	8	7	5	4	3	3	3	2	2	2	2	2	1	1	0	1	1	1	1	1

Table 12 - The unchanged rituals as described by the respondents when applying Agile
Black used to indicate a specific mention of a ritual. Red is used when the respondent said, “We do Scrum by the book”.

The sprint frequency was not altered by ten interviewees; this was followed by the sprint review and sprint planning, which were not changed by nine interviewees. The retrospective was kept the same by eight interviewees and the creation of a backlog was done without any change by seven interviewees.

4.4. Reported motivation to implement Agile practices and rituals

The process to pursuit an Agile way of working originates principally from internal or external drivers to change, which create the need to alter the organizational structure, its commercial approach, the organizational culture, or the relevant processes within an organization or team (as mentioned by Cameron and Green; Cameron & Green, 2015).

The interviewees mentioned one or more motivators for applying an Agile way of working within their teams (tab. 13). External threads and fluctuating customer needs were often mentioned as the reasons to change. Other reasons mentioned were the

need to address the absence of transparency and the desire to alter the way the organization handled project management. All of these motivated a company to shift to an Agile way of working.

Motivation or reason why applying Agile	#
Organizational drive to change based on threads and changing customer needs	7
No clear picture what the organizational unit is working on, what the costs are, and what the value is that is delivered. No transparency	4
Project management approach used did not work (waterfall)	4
Employee satisfaction	3
There is no focus or the focus is too abstract; decision-making takes too long or does not happen.	1
Cost reduction	1
Pressures from or inspired by IT	1
Lack of a vision	1

Table 13 - Motivation or reason why organizations started using an Agile way of working

After examining the motivations for an organization to shift to Agile ways of working, the study looked at the reasons an Agile approach was chosen. During the interviews, the respondents stated who and what inspired them to change (tab. 14).

Inspiration	#
From other organizations	21
Specifically naming a financial institute	7
Suggested by the IT department (internally)	10
Via media (books, magazines, professional literature, etc.)	7
By attending conferences	6
From other movements (lean, test automation)	2

Table 14 - Inspiration for a change into an Agile way of working

During the interviews, the respondents frequently mentioned “return on investment (ROI)” as an important motivating factor. This can be seen as an external factor: In other words, change is based on what the competition is doing. If the competition has a higher return on investment, they have achieved a higher level of overall effectiveness in terms of generating a profit with the available assets.

Almost all the interviewees who mentioned ROI as an important motivator explained why they had come to this conclusion. Since the responses they gave were diverse, they are mentioned separately (tab. 15).

Return on investment mentioned by interviewees	#
Focus gives choice so customer value can be achieved early in the project	12
More fun by doing what is needed and not what is asked. This led to ownership and gave better results.	10
The backlog gave the client an overview as to what was important and delivered value and indicated what did not deliver value	5
Workforce was scaled down (the interviewees were aware this was not the main goal of Agile)	4
Throughput is measurable	3
Transparency on what was needed to finish the work; this created commitment in the organization	3
More was delivered than had originally been planned	2
Less waste in terms of the budget	2

Table 15 - Return on investment comments made by the respondents

4.5. Critical success factors: starting small, senior level commitment, management vision, customer focus

The interviewees were asked what success factors had contributed to the successful application of Agile methods to the working of their teams. The respondents provided answers as to the advantages and challenges which they had experienced or the techniques they had used as they were implementing those changes (tab. 16).

Advantages	Mentioned	Challenges	Mentioned
Portfolio management created transparency	13	The impact on the resources	25
Intrinsic motivation	9	The company itself has a big influence on what a team can achieve	17
Everyone must be trained	8	Changing role for management	13
Empower people	5	Creating more time	7
Using available skills to deliver results	3	Difficult to define "empowerment"	6
Start small; use organic methods of growth	3	Staying Agile	5
Train management in Agile leadership	2	To become Agile, one must act Agile	4
Using all Agile rituals from the start	2	Changing is expensive	2
Start with easy results (quick wins)	2		
Use humour	2		

Table 16 - Advantages and challenges experienced by the respondents

The respondents, when asked to point to what the critical success factors were, also mentioned the involvement of management as being important to successful change. Eleven out of eighteen respondents mentioned that high or C-level management involvement was a critical success factor when beginning to use an Agile way of working (tab. 17).

Involvement	Number of respondents
Commitment	10
Secured at higher- or C-level management	7
Start with the top	4

Table 17 - High- and C-level management involvement as mentioned by the respondents

When looking at the practices and rituals that the participants used to apply Agile within their organization, they mentioned several practices as being very useful (tab. 18).

Ritual	Mentioned
Retrospective	6
Daily Stand-Up	2
Demo	1
Planning	1
Short iterations	1
Story mapping	1
Transparency across teams	1
Weight Method	1

Table 18 - Used practices and rituals

Several respondents stated that "hiring consultants" was a factor that contributed to the success of changing the way a team worked and the dynamics within a team.

5. Discussion

This chapter presents the results in relation to the guiding questions and discusses how these results contributed to this field of study.

5.1. What is Agile beyond IT domains and practices?

In this study, the application of an Agile way of working through the use of Scrum has presented itself as a leading, much-used practice by teams from different domains. The Scrum method has been adapted by them after these teams had seen the success in other domains or after they had read about Scrum in the media.

In the last few years, Agile has been moving out of the IT domain, but this study has demonstrated that, when Agile is applied outside of the IT domain, it is not exactly duplicate what has been done in the IT world. Some characteristics of IT implementation remain, especially when one examines the way organizations and teams are adapting this new way of working, but it is not a replication of what occurred in IT organizations. Most implementations of Agile ways of working are based on Scrum and are altered when applied. This was validated by the respondents during the interviews:

Scrum or [the] Agile way of working is used because it gives an objective and goals which must be delivered to tackle a problem (respondent 15, employee communication department).

The marketing project (cooperation between IT and business) was a success that made the business asking to use Scrum (respondent 17, Marketing manager).

The daily stand-up changed in terms of frequency, the retrospective, sprint duration, and sprint planning. Although the study did not look at the success or time needed to apply Agile methods, it seems that adjustments were made quite quickly after implementation. It is not clear if the changes were made after mastering the rituals. Besides the use of Scrum rituals, several organizations looked at other methods to become more Agile.

It can be demonstrated, then, that Agile changed from a strategic defence against foreign developments threatening American competitiveness (Kidd, Agile Manufacturing: Forging New Frontiers, 1994) into a successful way of working being used to deliver customer value in terms of IT software development.

Agile in IT has expanded through the introduction of several different methods and frameworks. The cases in this study listed Scrum (fig. 12) as the most used method when Agile is applied outside the IT domain. Since some interviewees are active as consultants, the results show a higher number of methods used than the total number of participants.

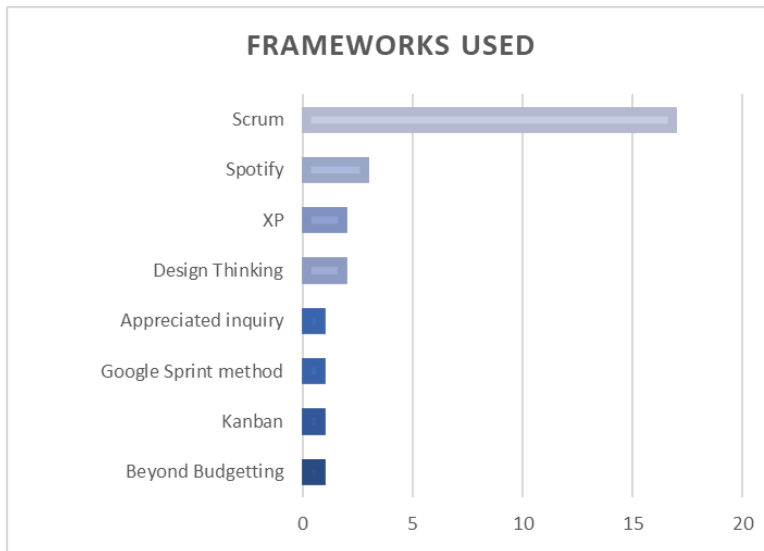


Figure 12 - Frameworks used, as stated by the respondents

Some of the methods mentioned were positioned as “pure” Agile methods (Scrum, XP, and Kanban). Spotify was mentioned as an Agile method, but it is normally used to scale the application of the Agile way of working. The participants did mention SAFe and LeSS when talking about scaling within the organization, but not as an Agile method. The “Google Sprint Framework” was mentioned as an Agile method, but in the literature, this is positioned as a five-phase framework for developing solutions by encouraging user-centered thinking (Google, 2018). This framework is based on Design Thinking. Kanban is mentioned as an Agile method, but its origins are in lean manufacturing.

5.1.1. Agile practices in different domains

Currently, it can be seen that Agile is being adapted by domains outside of IT. This study found that the main domains in which it was being implemented were marketing, sales, and customer support. To determine whether any new ways of working adopted by organizations could be considered “Agile”, the study examined what Agile characteristics were present in those non-IT organizations which were applying the new methods.

There are clear signs of Agile methods of working. Nerur and Balijepally (Nerur & Balijepally, 2007) describe the Agile way of working as being holistic and as involving

self-organizing teams, two factors that encourage the interchangeability of roles. Team members have overlapping specializations, generalized skills, and share knowledge so they can self-organize in response to emerging requirements. These teams focus on providing high customer satisfaction by applying three principles:

- The quick delivery of quality software
- Active participation of concerned stakeholders
- Creating and leveraging change

This study also found these specific factors in domains outside of IT. There are some differences in the maturity of their expression and, therefore, the adaptation of Agile methods of working was not the same as what had occurred in the IT domain. But the domains of marketing, sales, and communications are performing as Agile organizations. The products the teams deliver are delivered in short iterations and involve all the stakeholders. The main goal on which everyone is focusing is to create or leverage change.

5.1.2. Which Agile practices are used and why?

The Agile practices that respondents mentioned that they used were iterations (sprints), daily stand-ups, retrospectives, sprint planning, and sprint reviews. These were adopted because the respondents stated that they were using adaptations of Scrum.

Because a large theoretical development of the adoption of Agile ways of working is absent (Conboy & Fitzgerald, 2004), there are many diverse and contrary definitions present in terms of Agile, thus making it hard to define what constitutes a good Agile way of working both inside and outside of the IT domain. To determine whether an Agile implementation was effective, this research looked at practices used within teams outside the IT domain. Most practices were based on the Scrum framework, and the participants stated that they utilized this method extensively in their organizations. Although they were aware of other methods, they all mentioned that they used Scrum when asked for examples of how the Agile way of working was used by their teams.

In the IT domain, the Scrum method is widely used, and more than half of the organizations that have applied an Agile way of working over the last few years have chosen to use Scrum or a method that originates from Scrum (VersionOne, 2016), (VersionOne, 2018).

The application, success, and source of inspiration in IT is reflected in the world outside of the IT domain. Scrum is used more widely outside of the IT domain because non-IT organizations have become of Scrum and the important role it has played in the IT world. The transformation brought about by Scrum and other Agile methods of working can be seen as a re-engineering of tasks in an organization, and reflects a huge effort that is mandating change. Michael Hammer (Hammer, 1990), in his article “Reengineering work: Don’t automate, obliterate”, states that fundamental transformations are called for, and this requires management leadership with real vision to guarantee commitment and consistency. This is important to successfully complete a transformation that will increase alignment and create a perfect fit in terms of an organization’s strategy, structure, culture, and processes (Tushman & O'Reilly III, 1996). This obliges organizations to choose the right methods or frameworks to use. This is also mentioned by several interviewees, who provided information about the other methods and frameworks they had used.

5.1.3. What changes does the Agile way of working introduce?

The interviewees all stated that they applied a method which had its origins in IT. Several of them described that they had changed a ritual during or after implementation. Most of the respondents mentioned the use of an iterative process within the teams, which means that, in cycles of two or three weeks, the teams delivered a product. They all mentioned delivering value for the customer during these short iterations. Although many applied the principles contained in the Scrum manifesto as a guide to introducing Agile ways of working, the research found that there were differences in how this was done. Nine out of the eighteen interviewees altered the team’s updating mechanism. Agile-related daily meetings were changed in terms of frequency (every other day) or by timeboxing meetings down to 5 minutes (interviewee 16). These alterations were based on situational circumstances (for example, at schools, where time is limited). By keeping the stand-up to a minimum, the team had more time to focus on delivering results. In addition, all of the team members could be present at differing times (as a result of not having a daily meeting or because they used a daily conference call to check up on the progress being made).

Other than in IT, the request to change towards an Agile way of working was more top-down driven than bottom-up. Thirteen interviewees stated that management urged the teams to start using Agile. They were inspired by the results demonstrated by other organizations or by companies in the IT domain (tab. 19).

Motivation	#
From other organizations	21
Specifically, company X	7
Suggested by IT (internally)	10
Via media (books, magazines, professional literature, etc.)	7
Conferences	6
From other movements, like lean or test automation	2

Table 19 - Motivation to use the Agile framework

5.1.4. What did participants say stayed the same?

To determine the “agility” of the implementation, the interviewees were asked which rituals or practices they used, stopped using, or altered during the process of implementation of Agile ways of working. The responses showed that Agile ways of working were based principally on the Scrum method, a fact that was not only mentioned by the respondents, but that was demonstrated by the results from the rituals that had been used (as seen in section 4.3). Several respondents mentioned they had applied Scrum “by the book”. Three respondents mentioned that their company’s policy was to use an in-house developed method based on the Scrum framework:

We use in-house developed ‘Agile portfolio management’, which gives a broader view across projects instead of looking at just one project (respondent 1, consultant).

Agile is seen as equal to Scrum (respondent 5, consultant).

But the above point is also validated in table 9 in section 4.3, where almost all the respondents mentioned the use of Scrum in domains such as marketing, sales, communications, etc. There is even an Agile Manifesto that has been specifically written for use in the marketing domain:

I see most companies use Scrum. Especially the starters in becoming Agile use Scrum following the rules from the Scrum guide. Those who are more experienced consider agility as an attitude and not as a postulate to become Agile as Jeff Sutherland and Ken Schwaber describe Agile (respondent 8, PhD student).

This could be due to the clear explanation given by the Scrum guide (Schwaber & Sutherland, 2016), which is still under revision and is regularly updated with the latest insights.

Overall, the sprint frequency stayed the same. Most applications use a two-week frequency for the sprints for the teams to deliver products. In addition, sprint planning and sprint review are rituals that do not change in most implementations. The Scrum guide provides a good description and a good definition of these rituals.

The retrospective ritual was also specifically mentioned by the interviewees. This ritual is especially important in terms of the interviewees' responses. Fifteen mentioned (directly or indirectly) that they used the retrospective, but only six indicated that this ritual was important. Twelve interviewees mentioned that the retrospective ritual had been altered. Five mentioned the retrospective was no longer used:

The team could not speak out to reflect on the previous sprint. They found it hard to express themselves. This stopped. (respondent 6, Agile consultant).

There is a difference between the people themselves and the role that play during the application of Agile. The interviewees that stated that the retrospective was the most important ritual were primarily consultants and had coached the team in Agile ways of working. The interviewees that stated that the retrospective was not used any more were mainly people that had developed from within the organization and then started implementing an Agile way of working. Becoming Agile, implementing Agile ways of working, changes the way knowledge is shared. The focus in Agile teams should be on "individuals and interactions over processes and tools" (Beck, et al., 2001). This creates a basis for knowledge-sharing through interacting. This is further pointed out by the Agile Manifesto, which states that "a team must reflect at regular intervals to learn how to be more effective and in response adjust and tune its behavior" (Beck, et al., 2001).

As seen in section 4.5, some of the challenges were the "the impact on the resources" and the "changing role for management". This could also be an important reason why retrospectives were not continued within the team. The intention of the retrospective is to give the team a moment to "inspect" themselves and to check how they can improve their way of working, a practice that should be added to the next sprint planning.

If the team does not feel free to look at their behaviour and to learn how to change, they will resist doing so.

...the team did not feel comfortable any more with the methods after the retrospectives. Sometimes, it was also based on external influences; for

example, management telling [them that] they don't want a ritual to be used anymore (respondent 8, researcher).

This is not only bad for the team's behaviour, but also negatively impacts the process of change. Six essential characteristics are key to success when beginning to change the organization to become more Agile (Cameron & Green, 2015). When the impact influences these characteristics the change most probably will not be successful. For example, when management does not create a situation where the team can express themselves to improve, they fail in changing the team and prevent them from acquiring a learning mindset.

5.1.5. Which domains have adopted an Agile way of working?

This study found several industries and domains outside of IT where Agile has become a way of working (tab. 20).

Industry	#
Finance industry	6
Energy	2
Schools	2

Table 20 - Industries where the Agile framework has been introduced

Within these industries, there are several domains found that applied an Agile way of working (tab. 21). This shows that, in marketing, the Agile way of working was adopted the most often. Management support and communication were both mentioned twice as being why this occurred.

Domains	#
Marketing	9
Management consultancy	3
Communication	2
Schools	2
Geologists	1
Humans Resources	1

Table 21 - Domains that have adopted an Agile way of working

The reason why these domains were adopting Agile as a way of working was not related to one factor. Several interviewees mentioned that the drive came from external factors, such as other organizations or articles. Some interviewees mentioned that the key motivator was the connection between transparency and success:

You must have a big perseverance to achieve the change; be transparent, using humor and reveal yourself by saying you don't know if you don't. This drives the need to collaborate (respondent 1, Agile consultant).

It was my aim to help the team experience that Agile is a way of working that uncovers all. It places all the cards on the table, gives no solutions, but creates openness so decisions can be made (respondent 2, Agile coach).

This could also be a reason for a company to become Agile. If an organization is not in control, then Agile can help by making the work that the teams carried out “visible” to everyone else in the organization. Organizations then have the possibility to make choices and to bring focus into the teams.

Another reason to adopt the Agile way of working is that organizations are becoming digitalized, more digitally present, and thus are intensifying their cooperation with IT entities—all of which drives customers to demand faster product delivery. This can be seen in the State of Agile Report (VersionOne, 2016), where 62% of the respondents said that they are using Agile ways of working to accelerate product delivery. The results also mentioned organizations who use an Agile way of working to improve the alignment between business and IT. This has not changed significantly over last two years. Since this finding of VersionOne is beyond the scope of this research, this was not pursued further.

5.2. Agile management: What is the bigger picture?

The decision of organizations to become Agile and to motivate teams to adopt the Agile way of working has been caused by the increasing demand from customers for faster delivery and added value. These are qualities that are promoted by some authors of Agile frameworks. For example, Jeff Sutherland, Anton Viktorov, Jack Blount, and Nikolai Puntikov (Sutherland, Viktorov, Blount, & Puntikov, 2007) have seen an increase of 200% in productivity in large teams, but organizations seem unclear as to how they can use Scrum to enhance productivity. Carrying out a systematic literature review, Cardozo, Barza, França, and da Silva (Cardozo, Araújo Neto, Barza, França, & da Silva, 2010) looked for evidence of increases in productivity by those organizations that were using Scrum and they found it. Most of the papers they examined also found that, next to Scrum, other software development methodologies or process models were being used. The exact numerical value (percentages) of increases in productivity were not mentioned in the review.

The use of Agile methods is not simply about becoming more effective; it also involves bringing about value to the customer at an earlier moment in time so that the return on investment can be achieved at an earlier stage. This study did not seek to answer what

the effects were on returns in investment and how these could be measured. However, the interviewees stated that adopting an Agile way of working had led to an earlier and demonstrable return on investment. This could lead to the impression that work can be skipped when working in an Agile way, but the work, all of the work, still needs to be completed. By adopting an Agile way of working at an earlier stage, a return on investment could be achieved, but this will only happen if the sequence of tasks is changed. The tasks still have to be completed in their entirety.

You don't have to become more productive; the big benefit is by having the focus on the deliverable [and so] you are able to get the return on investment earlier. But if you look at the work that has to be done to complete the deliverable, all still has to be done. You can't do this with fewer people (respondent 11, consultant and writer).

The earlier return on investment is an important reason to adapt the Agile way of working. Most interviewees (thirteen out of eighteen) mention this as an important reason to change. This is in line with the customer value results that an Agile team wants to deliver.

5.2.1. Continuous learning retrospective: to improve Agile practices in new contexts

An important result of adapting the Agile way of working is the fact that an organization's knowledge base is increased. The team or organization that starts working in an Agile manner becomes a learning organization (Nerur, Mahapatra, & Mangalaraj, Challenges of migrating to Agile Methodologies, 2005).

Thus, the teams must learn and master the new rituals of an Agile way of working. This is mentioned by several interviewees, who referred to the Shu-Ha-Ri principle (fig. 13).

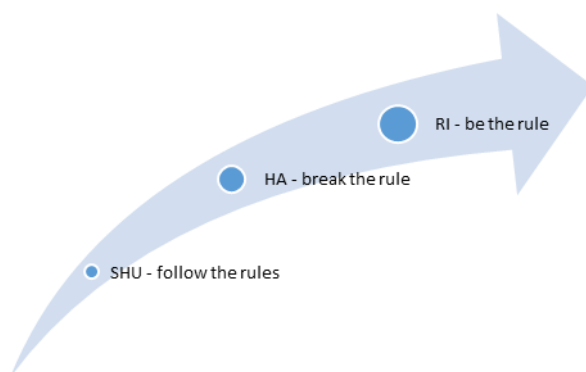


Figure 13 - Mastering new rituals

The expression “follow the rules” means that it is crucial that the guidelines presented by the different Agile methods should be followed. “Break the rule” is something that occurs when a team starts altering the rituals because they want to discover new ways of doing things. “Be the rule” occurs at the moment a team has to create a new set of rituals that fits its organization or team, thus helping them to become Agile.

Learning is achieved during the retrospective ritual, and involves looking back on what the team has achieved, what went well, and what could be improved. This is also mentioned by Sjoerd Romme (Romme S. , 2002), who describes the shift from explicit knowledge to implicit knowledge, a phenomenon that takes place through internalization and applying routines and network relations. Learning, therefore, also originates between people. When people share their expertise, implicit knowledge is made explicit. This necessitates that people work together and that people trust each other.

Performing a retrospective must be seen as a knowledge-creation process, which Nonaka and Takeuchi describe as a process of creation, continuous innovation, and gaining the competitive advantage. Continuous innovation means using the knowledge-creation circle, as described by (Nonaka & Takeuchi, 1995) to learn and to improve the team. By looking back on the results, the team learns from their mistakes. By sharing what they know, the team externalizes its knowledge and creates new knowledge. This also adds to the discussion of which method to choose. As Kniberg and Skarin (Kniberg & Skarin, 2010) assert, the method is not the goal—continuous learning is. The crucial element lies in a short feedback loop, which is key to learning. Teams should question everything, experiment, fail, learn, and then experiment again. They should not worry about getting it right at the start they should just begin and evolve during the process (Kniberg & Skarin, 2010).

5.3. Agile and the evolution of management methods: What is next?

This section of the study seeks to view into the future in terms of what Agile methods of working could become next and how management methods will evolve. The discussion is divided into two parts: an examination of methods and frameworks and, secondly, an analysis of evolving organizational structures.

5.3.1. Which methods are on the horizon?

During the last years, the frequency of Agile use has been increasing, especially in the software industry. This phenomenon has also found its way into the world outside of IT. The rising popularity of Agile methods is depicted in the graph below, which reflects search trends in Google involving terms having to do with Agile methods of working. “Agile” as a search phrase has been gaining popularity and has been the subject of a rising number of Google searches and, since 2007, the same can be said for the search term “Scrum”.

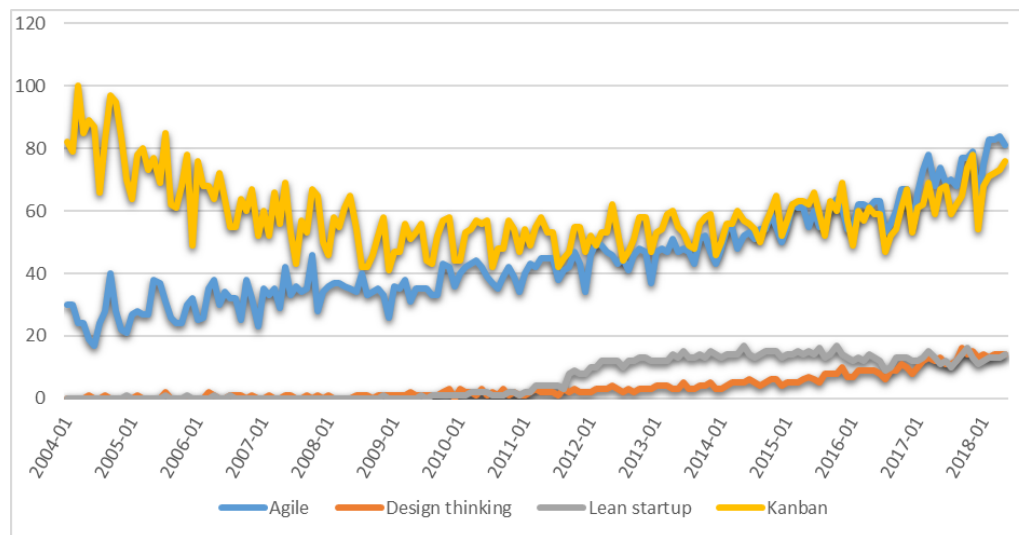


Figure 14 - Popularity of Agile frameworks as a search term from 2004 - 2018 (source: Google Trends)

The graph above (fig. 14) shows that the awareness of Agile methods of working is increasing, mirroring a phenomenon that started in 2011, when the awareness of other methods also began to rise. The initial decline in interest in relation to Kanban starts, perhaps surprisingly, to reverse in 2011, and can, perhaps, be explained by the fact that Kanban was adopted by the Agile community.

The graphs do not show this, but a study of the literature shows that Agile was becoming more popular even before the Agile Manifesto was published. Radigan (Radigan, 2017) found that the core principles of the Agile way of working are timeless and applicable to almost any industry, although, initially, IT and software development teams were the first to begin implementing Agile methods and practices. Radigan concludes that IT and software companies, because they had few overhead costs, could begin applying the basic new principles once they had understood them. Applying Agile was easier than implementing something like Kanban which, on a factory floor, would involve major changes to physical processes and the addition of substantial materials. In

a software development team, the only physical things that are needed are a board and cards, both of which can be virtual (Radigan, 2017).

Changes in how organizations operate could also explain the trends that were discovered. Since organizations have started to use an Agile way of working, they have discovered that not all frameworks used by IT are ready for application to every organization. When looking to make organizations Agile, people are looking for frameworks and methods that respond to the specific conditions present in their organization. Frameworks such as Scrum, XP, and Kanban have been specifically designed for the domain of software development and are not so universal that they can be used in any organization or domain. At this moment, it is clear that organizations are not only fine-tuning a method or framework, but also that they are searching for methods and frameworks that are a better fit for them (fig. 15). The increasing popularity of Scrum is paralleled by trends involving Agile. In the last years the rising popularity of Design Thinking, Lean Startups, and growth hacking have become clear.

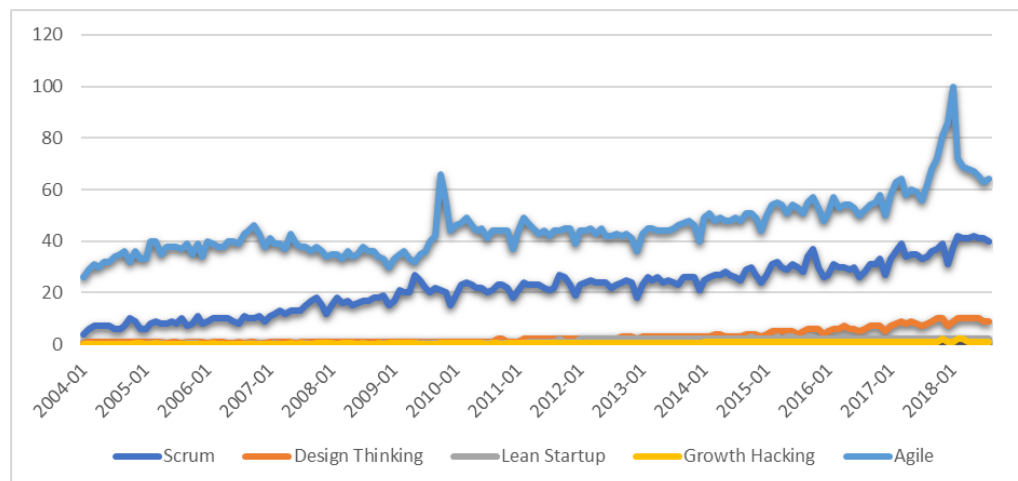


Figure 15 - Trends in Agile methods from 2004 - 2018 (source: Google Trends)

5.3.2. Domains with the need for creativity or feedback show a higher pace of change and can take advantage of Agile methods

Thus, it can be seen over the last few years that different domains and industries are moving towards an Agile way of working. The rising popularity of Agile can be explained by changes to the world as we know it. As stated by Marshall McLuhan, the world is becoming a “global village” (McLuhan, 1960), which means that the entire world is connected and that news and developments are shared over continents, countries, and cultures; change reverberates at the speed of light, and this phenomenon impacts organizations and how they work. Organizations must increase the pace to keep up with competition, and a way to do this is to automate the production line or to automate jobs

that are repetitive by nature. Frey and Osborn (Frey & Osborne, 2013) found that there is a connection between a lack of creativity and the likelihood that a job will be automated. They discovered that the more creativity that day-to-day activities require, the less probability there was that the job would be automated. In addition, jobs that require feedback cannot be easily automated. Feedback is given in a multiple of ways, and can involve the emotional expressions on the part of participants solving a difficult and challenging task (Frey & Osborne, 2013). In their study, they presented the probability of jobs being automated (fig. 16).

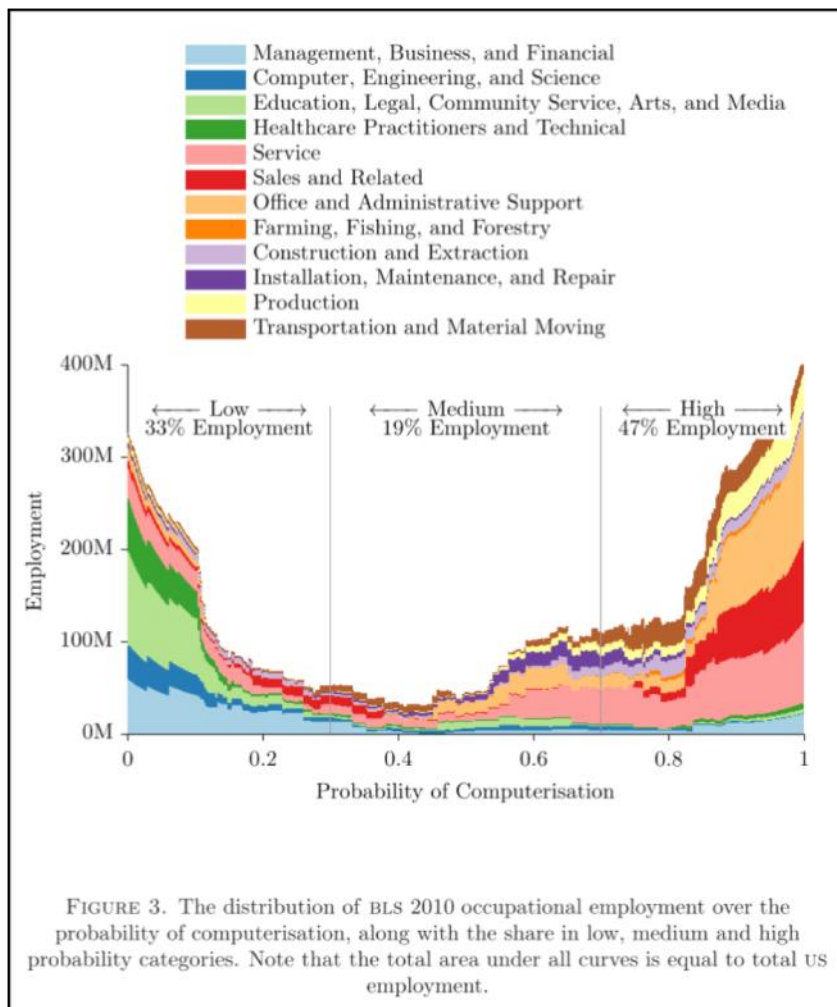


Figure 16 - Reprinted from *Future of Employment* - Frey & Osborne (2013)

This study compared the findings of Frey and Osborn to the results in this research and found some grounds for comparison. The domains outside of IT where Agile was being applied (section 4.2) were roughly comparable to what Frey and Osborn had discovered. In other words, similar to Frey and Osborn's study, it was discovered that Agile was being applied in several domains such as marketing, management, schools, communication, and HR (fig. 17).

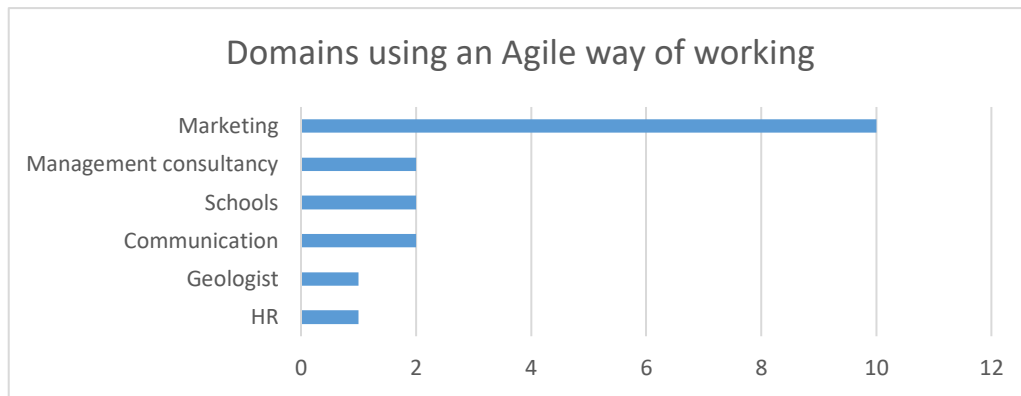


Figure 17 - Domains where Agile was being implemented (mentioned by the interviewees)

Frey and Osborn found that jobs in computer engineering, science, education, legal, community services, management, business and financial services, and arts and the media were not easily automated (Frey & Osborne, 2013). The only domain that was not suitable for Agile ways of working and thus did not adopt them was the service domain, which can be explained by the fact that the service domain is more individualistic, more based on individual labour, whereas Agile is a method of making teams more effective.

5.3.3. What was the purpose of using Agile?

The organizations studied all had a specific purpose for adopting the Agile way of working. Although external threats and customer needs are mentioned most often as motivations, it is surprising that “absence of focus” and the replacement of “not functioning by the waterfall method” are also mentioned as reasons to change. Although an Agile way of working creates transparency, it can also create focus by enhancing customer involvement. What is surprising is that, although organizational needs were often the reasons for adopting Agile methods, the chosen solutions had an impact on the team level. Some interviewees stated that it was difficult to make decisions, and that the transparency offered by Agile made decision-making easier.

5.4. Limitations and future work

This study looked at the how successful the application of an Agile way of working has been. The main focus was on the impact of Agile within teams outside of the IT domain. It did not look at the success of a specific application within organizations nor did it look at the results in terms of providing specific performance indicators.

Because the number of organizations outside the IT domain is vast, the connection of Agile ways of working and specific performance indicators is a difficult subject to study because it requires large-scale quantitative research. Because this study was based on a

qualitative research design, its scope was too limited to engage in an investigation of such a huge topic. The research undertaken in this study was focused on discovering what specific organizational strategies and what performance factors ensured the successful implementation of Agile.

Such research can also be undertaken on the basis of case studies. This approach was not chosen because the goal of the investigation was to come to a broad, overall view of the subject of Agile implementation and where Agile is being applied. This could be overcome in future research since the different domains not applying Agile are known and research can thus be oriented to one or more domains or methods to gain an in-depth knowledge on the subject.

6. Conclusions and recommendations

This research performed a qualitative international study on the application of the Agile way of working outside of the IT domain. This was done by approaching 31 individuals for an interview, 18 of whom participated. The interviews were semi-structured and were held face to face or via Skype. The interviews lasted between 45 minutes and 3 hours. This resulted in an extensive collection of data.

6.1. Conclusions

Not only did the study analyze the success (or otherwise) of applying Agile ways of working outside of the IT domain, it indicated that the most successful implementations took place in domains such as management, financial departments, schools, legal teams and community services. When the data was analyzed and compared to see what kinds of jobs could be automated, it showed that when employees were creative, when feedback was important, and when people were more highly educated, the likelihood of Agile methods being successfully introduced was higher. Introducing Agile in those contexts had a positive impact on the organization.

What was also demonstrated by the research is that teams tended to Scrum as the *de facto* standard when they were beginning to introduce Agile methods of working. However, the results also showed that changes occurred during the application of new methods, and the organizations began searching for other, relevant frameworks that could be used (such as Beyond Budgeting, Design Thinking, etc.).

Differences were also found in the way teams adopted the Agile way of working. Most teams had adopted the Agile rituals as described by the framework guides and the manifestos, but altered them to fit the team. But not all of the rituals survived Agile implementation, and some of them were changed and even abandoned. Most teams adopted the daily standup, but changed the frequency of this ritual. The retrospectives were adopted by almost all teams at first, but dropped by almost half of the teams during or after the implementation. This indicates most teams are using Agile, but that they did not get to the stage where they were completely Agile and become a learning organization.

The results show that Scrum is still the most popular method, but other methods are also used; Kanban, Lean Startup, and Design Thinking are also gaining popularity. Although IT-based methods are used in every organization or domain, organizations are looking for ways to deliver customer value in a faster way, depending on the discipline

of the team or organization. Some organizations have stopped the use of IT based stratagems and are discovering how to use other methods. The teams that are looking for other methods that better fit their way of working all depend on external support when implementing those methods.

In this light, it is important to recognize and support an organization's eagerness to learn, and to realize that organizations need to be helped to enhance their feedback and creativity, thus enabling them to choose other frameworks when needed. In addition, it is important that the feedback received is applied to enhancing performance and the learning curve. It may be said that the choice of framework to be used should not be the main focus: the use of feedback and creativity in order to enhance their improvement should be the primary goal.

6.2. Validity considerations

Due the fact this research was qualitative by nature and that it was explanatory, it was important to guarantee the validity of the research. To achieve this, several sets of measures were added, which safeguarded the soundness of the findings. The constructive validity was secured in the research design. Research that is carried out according to a qualitative design bases its data collection on interviews. There is always the risk that the group of participants is not large enough for conclusions to be drawn. The group of respondents interviewed during this study was large enough for the results to be credible. Every interview was carefully transcribed and was sent to the participant for review, thus verifying the accuracy of the responses. Remarks or changes suggested by the respondents have been incorporated into the final version, which formed the basis for the analysis.

To secure internal validity, every interview started with a few open-ended, personal and simple questions that created a pleasant atmosphere for the respondent. The data was coded in accordance with open-, axial- and selective coding as described by Strauss and Corbin (Straus & Corbin, 1998). Structuring the data also enhanced its internal validity.

The external validity was ensured by selecting respondents from different industries and domains. Open coding created the possibility of converting the data and enabled it to be generalized so the results could be used in other environments.

By recording and transcribing the interviews and sharing the results of the interviews with the respondents, the reliability was secured. This reduced the likelihood that the data could be misinterpreted.

6.3. Recommendations for future research

This study was focused on seeking more insight into Agile ways of working outside of the IT domain. The qualitative research reported here enhanced, in a small way, knowledge about the topic, but there are still some subjects that could be researched in the future.

Firstly, this research has provided a lot of data about frameworks that are currently being used. It would be good, in this regard, to do a follow-up study by observing a team or an organization to discover the success of the Agile way of working as it is used in a real-life context, thus exploring how the results of this study could be practically applied.

Secondly, an interesting subject inviting further study would be to look how teams operate, that is, if they master a method before they start altering it to fit their needs. Such a study could pinpoint why the changes are taking place at a specific moment in time during the application of an Agile way of working.

Thirdly, a future study would involve looking for the application of the methods mentioned by several respondents but not (yet) widely used, such as: Beyond Budgeting, Design Thinking, etc.

All of the above would enhance our knowledge of Agile ways of working outside of the IT domain, and would give organizations and researchers the tools they needed to ensure the success of future implementations of Agile methods and frameworks.

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8. Appendix A – The Agile Manifesto

(This is an exact copy of the Agile Manifesto as available at <https://agilemanifesto.org>)

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

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

That is, while there is value in the items on the right, we value the items on the left more. Principles behind the Agile Manifesto. We follow these 12 principles:

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

At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

The manifesto is signed by:

Kent Beck	James Grenning	Robert C. Martin
Mike Beedle	Jim Highsmith	Steve Mellor
Arie van Bennekum	Andrew Hunt	Ken Schwaber
Alistair Cockburn	Ron Jeffries	Jeff Sutherland
Ward Cunningham	Jon Kern	Dave Thomas
Martin Fowler	Brian Marick	

9. Appendix B – Interviews

This chapter gives the questions used during the interviews. Both pilot and final interview questionnaires are presented.

All interviews started with the following three questions/statements:

INTRODUCTION / ETHICAL CONSIDERATIONS

- | |
|--|
| <ol style="list-style-type: none">1. Participation is voluntary.2. The responses will be made anonymous.3. Asking for agreement to record. |
|--|

9.1. Interview questions pilot

9.2. Introduction

1. Could you please tell me about yourself? Your educational background, and current position/role.
2. Could you please describe your organization and the organizational unit you work for?
3. Do you have any experience with Agile methods/Scrum and how long?

9.3. Experience agile outside of IT

1. (For consultants) Do you have experience with implementing agile methods/Scrum outside of IT? Can you give us concrete example(s)?
2. (For host organizations) Do you have experience with implementing agile methods/Scrum outside of IT in your organization? Can you give us concrete example(s)?
3. How did that begin? How and why did you start applying agile methods/Scrum outside of IT?
4. (For consultants) How did you get requests from organizational departments to implement agile/Scrum?
5. How do you usually get requests to help at implementing agile/Scrum?
 - a. Who initiated the change?
 - b. How got that person inspired?
6. (For host organizations) How did the change (to implement agile/Scrum in the non-IT department) start?

- a. Who initiated the change?
 - b. How got that person inspired?
- 7. What was the vision?

9.4.Change process / Introduction process agile in domains other than IT

- 1. How did you initiate or lead the change?
 - a. Did you used a specific change process to manage the change?
 - b. Could you give me 5 to 10 concrete steps on the change?
- 2. How did the concrete change differ to the original plan?
- 3. During the change, did you direct the change(project) or direct the people?
 - a. If applicable, why did you choose to direct this part?
- 4. Did you achieve the original goal(s)?
- 5. Did you experience any challenges during the change process?
- 6. Looking back could you define success factors for the change?

9.5.Process now

- 1. How is agile implemented in the non-IT domain?
- 2. Could you state the concrete steps of the current agile process within the organization/project?
- 3. Did you establish and maintain close and effective customer collaboration and if so, how?
- 4. What are the advantages to the original process?
- 5. What are the disadvantages?

9.5.1. Looking further

- 1. Would you do anything in a different way?
- 2. Where do you see this leading in the future (based on your organization)?
- 3. What are the plans?

9.6.Interview questions

9.6.1. Introduction

- 1. Could you please tell me about yourself? Your educational background, and current position/role.
- 2. Could you please describe your organization and the organizational unit you work for?

3. Do you have any experience with agile methods/Scrum and how long?

9.6.2. Experience agile outside of IT

1. (For consultants) Do you have experience with implementing agile methods/Scrum outside of IT? Can you give us concrete example(s)?
2. (For host organizations) Do you have experience with implementing agile methods/Scrum outside of IT in your organization? Can you give us concrete example(s)?
3. How did the move to applying the agile way of working begin? How and why did you start applying agile methods/Scrum outside of IT?
4. (For consultants) How did you get involved in implementing agile/Scrum in different organizational units?
5. How do you usually get requests to help at implementing agile/Scrum?
 - a. Who requested your involvement, initiated the change?
 - b. How got that person inspired in implementing agile in a non-IT domain in the first place?
6. (For host organizations) How did the change (to implement agile/Scrum in the non-IT department) start?
 - a. Who initiated the change?
 - b. How got that person inspired?
7. What was the vision?

9.6.3. Change process / Introduction process agile in domains other than IT

1. How did you initiate or lead the change?
 - a. Did you used a specific change process to manage the change?
 - b. Could you give me 5 to 10 concrete steps on the change?
2. How did the concrete change differ to the original plan?
3. What where the assumptions when you started?
4. During the change, were you the project manager of are you the team lead?
 - a. If applicable, why did you choose to focus on this part?
5. Did you achieve the original goal(s)?
6. Did you experience any challenges during the change process?
 - a. What was the motivation to change?
 - b. How did the team get the capacity to make the change?
 - c. Was there an opportunity (created) to support the change?
7. Looking back could you define success factors for the change?

9.6.4. Process now

1. How is agile implemented in the non-IT domain?
 - a. What the practices/routines/rituals/ceremonies did you implemented [Stand-up, reviews, using boards, timebox, etc.]
 - b. Which practices or routines were useful?
 - c. How did you change / adapt any of those (changed timing, frequency, explanation, goal, etc.)?
 - d. What is the reason some practices are no longer used?
 - e. What were the barriers to adoption?
2. Could you state the concrete steps of the current agile process within the organization/project?
3. Did you establish and maintain close and effective customer collaboration and if so, how?
4. What are the advantages to the original process?
5. What are the disadvantages?

9.6.5. Looking further

1. Would you do anything in a different way?
2. Where do you see this leading in the future (based on your organization)?
3. What are the future plans within the organization?
4. Can you imagine other domains where those Agile practices/routines can be applied?
(Where does it make sense, where not?)
5. Is there any advice you would like to share with other organizations?

9.7. Altered Interview questions used with participant 9

Interview questions Thesis research

9.7.1. Introduction / ethical considerations

Participation is voluntary, the responses will be made anonymous, asking for agreement to record

9.7.2. Experience agile outside of IT

1. How do you usually get requests to help at implementing Agile / Scrum?
 - a. Who requested your involvement, initiated the change?

- b. How got that person inspired in implementing agile in a non-IT domain in the first place?

2. What was the vision?

9.7.3. Change process / Introduction process agile in domains other than IT

- 1. How did you initiate or lead the change?**
 - a. Did you used a specific change process to manage the change?
 - b. Could you give me 5 to 10 concrete steps on the change?
(I need these steps for later analysis. Most important result of interview)
- 2. How did the concrete change differ to the original plan?**
- 3. What where the assumptions when you started?**
- 4. Did you achieve the original goal(s)?**
- 5. Looking back could you define success factors for the change?**

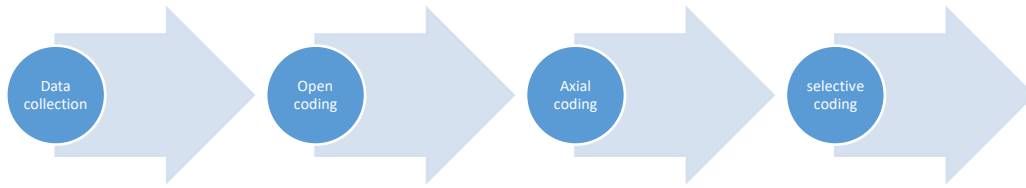
9.7.4. Process now

- 1. How is agile implemented in the non-IT domain?**
 - a. What the practices / routines / rituals / ceremonies did you implemented [Stand-up, reviews, using boards, timebox, etc.]
 - b. Which practices or routines were useful?
 - c. How did you change / adapt any of those (changed timing, frequency, explanation, goal, etc.)?
 - d. What is the reason some practices are no longer used?
 - e. What were the barriers to adoption?

9.7.5. Looking further

- 1. Where do you see this leading in the future (based on your organization)?**
- 2. Can you imagine other domains where those Agile practices /routines can be applied? (Where does it make sense, where not? ... ask for specific examples)**
- 3. Is there any advice you would like to share with other organizations?**

10. Appendix C - Code book



Code name	Description	# codes
1 Motivation	What motivates organizations to apply agile outside the IT domain? is it crisis or is there another drive? <i>Poiesz states that: Motivation refers to the goals</i>	0
1.1 Experience	Description of the method and role the respondent has experience with applying the agile way of working outside IT.	60
1.2 Need for change	crisis, competition is gaining, org need to lower costs (cheaper), organization too complex	35
1.3 Inspiration	What of by who got the organization (or initiator) inspired to make the move to agile?	61
1.4 Return on in Investment	Statement of what was expected by the organization to be the result of the new way of working.	44
1.5 Objectives	Defined goals/targets set by the organization when implementing the agile way of working.	38
1.6 Industry	Industries the respondent has experience in applying the agile way of working.	23
1.6.1 Domains	Here all domains are mentioned. Both the domains where respondents have experience but also the domains they think agile could be applied (or not).	30
2 Used methods	What methods are used by the different organizations when applying agile way of working outside the IT domain? <i>This could be translated into the external conditions.</i> <i>Poiesz states: Opportunity refers to the external conditions.</i>	0

Code name	Description	# codes
2.1 Framework	Method used by the organization	45
2.2 Success factors	What are critical success factors: start small, senior level commitment, management vision, customer focus.	0
2.2.1 learning organization	Ways the organization is developing their skills on applying agile.	40
2.2.2 Challenges	Description of issues and challenges to overcome when applying agile outside of the IT department.	89
2.2.3 Success factors	Actions, examples, results and consequences when applying agile outside IT that make the implementation successful.	73
3 Change design	How they did the implementation: started small, move to big - started with one team -> success -> commitment - learning journey <i>Poiesz states that capacity is: Capacity refers to the instruments</i>	0
3.1 Capability	The way an organization or team secured the competent and efficient implementation of the agile way of working.	0
3.1.1 Knowledge Management	An expression of knowledge management performed during the agile way of working.	5
3.1.1.1 Education	Education or training the respondent had followed.	17
3.1.1.2 Training	To master a new skill, you must learn and practice. For agile way of working this means take the team/organization along the new path.	18
3.1.2 Learnings from applying agile	Short tips, tricks or interventions during the application of agile that are given by the respondent. Not being challenges or Success factors.	30
3.1.2.1 Experiment		1
3.1.2.2 EnergizeTeams		1
3.1.2.3 HardWork		1
3.1.2.4 KickOff		1
3.1.2.5 MakeChoices		1
3.1.2.6 MasterBeforeAdjust		1
3.1.2.7 NoFear		1
3.1.2.8 OrganizationalNeed		5

Code name	Description	# codes
3.1.2.9 RightPeople		3
3.1.2.10 StartSmall		2
3.1.2.11 BeFlexible		6
3.1.2.12 TeamFocus		5
3.1.2.13 USeTheRightMethod		2
3.2 Change Strategy	A description of the steps involved in the changing the way of working in to an agile way of working.	61
3.2.1 Decision	Who is making the decisions during the change process.	8
3.2.2 Guiding coalition	Arranging a group or team to help the changing organization or teams start using the agile way of working.	11
3.2.3 Evaluation	Is the change evaluated after or during the change?	12
3.2.4 Plan	Creating a change plan.	16
3.2.5 No plan	Was there a plan at the start of the change?	10
3.2.6 Coaching	Mastering the agile way of working is to train or coach the organization in becoming agile.	25
3.2.7 Starting event	The organization or team is introduced to Agile way of working during a starting event.	7
3.2.8 Change support	Things, products, processes, etc. used to make the change to agile working, not being the standard change processes.	26
3.3 Initiation	This describes the person or organizational unit who initiated / started the move to agile within the organization but outside the IT domain.	27
3.4 Being flexible	Statement of the organization or team being able to adopt to the change.	4
3.5 Involved management level	The involved management level described by the respondent and the way management has to be involved according to the respondent.	28
3.6 No change in way of working	Examples of issues why the team doesn't want to change the way of working into the agile way.	6
4 Routines	What are the practices organizations used when applying agile way of working within their organization?	0

Code name	Description	# codes
4.1 Impact	What is the impact of the used methods? Popularity or external pressure on the choice rather than potential fit in context.	0
4.1.1 Future of agile	What does the respondent say about the future of agile? Where is leading to?	20
4.1.2 Organizational changes	What was the impact on the organization when applying agile way of working outside IT.	45
4.1.3 Do agile not being agile	Organizations and people tend to adopt a new method/framework because it is hyped. In agile this is often called: they do agile but don't be agile. You have to be agile to profit from the method/framework and to use it to gain an advantage on the competition.	13
4.2 Survey the customer	Interaction with the customer is described by the respondent.	6
4.3 Role	What is the role the respondent has played in applying the change to an agile way of working? Was this a change manager or a specific agile method/framework role, etc.	5
4.4 Ritual	The rituals used by the non-IT teams or organization when applying the agile way of working.	90
4.5 Rituals altered	When implementing a new way of working by using a frame work some rituals will or will not fit the organization. These rituals will be altered or skipped by the organization.	45
4.6 Important rituals	The rituals that the respondents define as useful in the move towards agile way of working.	14

11. Appendix D - The interviews

11.1. Interviews (Pilot-Phase)

The first interview was with an employee of a small company presenting itself as a company that helps organizations to become Agile by using Scrum. This company focuses exclusively on customers outside IT.

This company provides training and gives advice to organizations when they are changing their way of working by application of Agile or Scrum within different industries, mainly in relation to marketing departments.

Interviews two and three were held with participants who worked at the same organization; both are freelance employees and were hired to act as Agile coaches within the marketing department. The marketing department has two hundred marketers, who are divided into fourteen Scrum teams. These teams are coached by three Agile coaches.

During the pilot-phase, the first interview was held via phone; the other two interviews were held face-to-face at the financial institute where the participants worked. All interviews were recorded; were put into a transcript, and were sent to the participants for a final revision. Participant two stated that the transcript was not a reflection of the interviews and that s/he would respond with an adapted version. The participant did not in the end provide a revised version of the transcript. The initial transcript was used during the pilot phase.

11.2. Interviews

This section describes the interviews that took place after the pilot phase.

The fourth interview was with a participant from Switzerland. The interview took place via Skype and was recorded and transcribed for review. The participant returned the transcript with some adjustments. Four items were changed to accord with the wishes of the participant. Three revisions involved changing some unclear wording (question 1.1 should have read “software development” and not “software developer”); in addition; the description of the tasks the interviewee carried out was corrected (questions 4 and 7), and in one instance (question 6), the transcription was amended to reflect the precise answer.

The fifth interview was with a consultant from an international organization providing services in strategy, consulting, digital matters, technology, and operations. The organization is a partner with more than three-quarters of the Fortune Global 500 and with expertise across more than 40 industries and all business functions. The participant has had 5 years of experience with Agile transformations. The interview was held face-to-face at the participant's office. The participant has international experience with the application of Agile. At this moment in time, the participant is involved in consulting clients during transformations towards Agile and trains people in Scale Agile transformation for organizational leadership and operational level employees.

The sixth participant has had six years' experience with applying Agile at a marketing department in the energy industry. The participant's interview was conducted face-to-face. The participant has had experience working with Agile at different organizations. At the energy organization, the move to agile started at the business level and involved steering the IT department towards Agile ways of working. The examples used during the interview originated from his/her experience in applying Agile at the marketing department.

Participant seven lives in the United States. The interview was conducted using Skype and recorded for transcription. The participant has had more than ten years of experience in helping organizations to become more Agile. The focus has been on the governance within the organization. In the last few years, the participant has discovered the connections between various Agile methods. The participant has written several books on alternative governance models and is currently working on a book looking at the use of Scrum in organizations.

Interview eight was also conducted via Skype with a Ph.D. student, who is engaged in research on Scrum on the topics of how Agile can be used for physical product development and how to apply the principles from the software industry into the development of physical products. The research approach of the participant has been designed like a Scrum project. The participant had limitations on sharing information due to a confidentiality agreement with the organization on which his research is focused. Despite this agreement, the participant participated in the interview.

The interview with participant nine was altered. The altered questionnaire has been added in section 14.3. The participant had only 30 minutes for the interview, so the questionnaire was shortened to fit this timebox. The interview was held via Skype. The

participant did not have any hands-on experience in applying Agile methods outside of the IT domain, but as public speaker, he has followed development within the IT domain. The participant gave his view on the development in the domain based on his knowledge and experience with clients. Because he plays an advisory role in terms of Agile, he often does not see how implementation plays out in a real-life context.

The tenth interview was held face-to-face in the office of the participant. The participant has had experience in the financial industry applying Agile within IT teams. At this moment, the participant is working at one of the biggest retail organizations in the Netherlands and is responsible for implementing the agile way of working at the HR Department. The implementation of an Agile working at this team was brief. Scrum was used during a small project. This project has finished, but the experience formed the foundation for the next steps he will take. Next year, the organization is starting a program of focusing on customers and Agile ways of working will form the foundation.

Participant eleven was recommended to me by participant seven. They are writing a book together, uniting the governance experience of participant seven and the Agile experience of participant eleven. The interview was held on Skype. The participant has more than ten years of experience with Agile. In 2003, she co-authored about “software development in large projects”.

Interview twelve was held face-to-face at the office location of the participant. The participant has recently changed jobs and an important goal in this new job is the application of Agile working at his current assignment. The experience of the participant was based on the application of Agile working at a large financial institute in the Netherlands. This organization offers insurance, savings, mortgages, and investment services. The participant was working at the marketing department and was co-responsible for the online services of the organization.

Participant thirteen is employed at a consultancy firm which advertises their success on implementing Agile ways of working outside the domain of IT. The organization offers consultancy services and Agile training. This participant was found via internet searches. In addition, participant eighteen and nineteen were found via the same search since they work(ed) at the same organization. In addition to consulting and training client organizations, the organization itself adopted Agile ways of working years ago. The director has published a book on Agile ways of working and the organization also has created its own tools to help clients implement Agile.

Interview fourteen was held via Skype. The participant lives in Colombia and is the owner of a consultancy and training company. The participant was found via the internet, where he has published a presentation on his using Agile during construction projects.

Interview 15 was held face to face at the office of the participant. The participant works in the communication department at a Dutch university. Using Agile formed part of his previous job, but he also wants to apply it at the university. This participant was found via my supervisor's professional network.

After a search on Agile/Scrum/education contact was made with a small organization that focuses on the implementation of Scrum at schools. This organization directed me to participant 16, who has had several years of experience in implementing Agile and specifically with using Scrum with schools. The contact was by e-mail and the interview was done at an external location (restaurant) face to face. The participant gave me a set of items they use when implementing Scrum at schools. This was a set of cards, a poster with the process being used, and a description of roles.

Participant eighteen was recommended by participant six. They had worked together on implementing Agile. The interview was rescheduled several times due to missed appointments by the participant. The interview was held by phone (it was initially planned that we would meet face to face).

The participant for interview eighteen was found via a website search mentioned at the interview with participant thirteen. The participant had just left the organization, but LinkedIn contact was made. Due to holiday and work appointments, this interview was held in November 2017. The interview was done via Skype.

This last interview was initiated after contacting the company of participants thirteen and eighteen. Contact was initially made via e-mail and the interview took place by phone. When the research subject was introduced, it became clear that the expertise of the participant was not with non-IT applications of Agile, but only with IT applications. The non-IT knowledge the participant had was based on hearsay from fellow-workers. Therefore, the interview was ended and not transcribed or added to the results of this report.

