

Towards Agile Contracting

Enabling agile project management through contracting in the construction industry

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Enabling agile project management through contracting in the construction industry



Delft University of Technology
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ARUP

Arup

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Preface

Dear reader,

With this MSc thesis, written as a part of my graduation for MSc ‘Construction Management and Engineering’ (CME) at Delft University of Technology, I conclude my studies in Delft.

This thesis is about ‘agile project management’ in relation to contracts in the construction industry. The research was conducted within the company Arup in Amsterdam, the Netherlands, using their resources.

I want to thank the people who helped me conducting this research – both directly and indirectly.

First of all, my committee: Hans Bakker, thank you for your clear notes and sharp questions. It helped me tremendously to get to the core of my research and to improve my thesis. You kept me ‘on my toes’. Monika Chao-Duivis, it was always clarifying to talk with you, due to your astonishing knowledge of – and experience in – building law. You were very open, welcoming and supportive. Afshin Jalali Sohi, you were ‘as a friend’ available to discuss agile project management, helping me to write this thesis. Your door was always open for me. Jeroen Hutten, thank you for your encouraging view on my research. You have been supportive and interested in my research. You helped me – not only with the content of this thesis but you also motivated me. Ameike Weijers, thank you for all your help in the beginning of my thesis and showing me my way in the company Arup.

Secondly I thank the project- and program management team of Arup Amsterdam, under the leadership of Olav Ruiters. You all helped me during various meetings (and during lunch). Arup gave me the chance to see the ‘ins and outs’ of project management and contracting. Also, the company gave me the chance to get my official AgilePM certificate.

Last but not least, I want to thank my parents, for always supporting me during the last couple of months, as well as during my entire studies. Furthermore my brother Sebastiaan, with whom I discussed ‘agility’ many times during bike rides – or just with coffee. Thanks to my whole family, Anne, Sacha, Jarom, and Saul, for their unlimited support. And Jet, thank you for being there to listen and support me every day during the past months.

I started my MSc CME because of my fascination for complex construction projects. I hope that my research will contribute in avoiding their corresponding failures.

Enjoy reading this thesis!

Allard de Stoppelaar
February 2017, Amsterdam

Executive summary

'Agile'¹ or 'Agility' currently is a popular expression within project management. *Agile project management* is a method to meet the ever-changing needs and requirements throughout a project. An agile approach requires small multi-disciplinary development teams, working iteratively and in close collaboration with the client. This project management approach is developed in the information technology (IT) industry in the 1990's. Since then, agile gets more and more attention from different industries; the construction industry is no exception.

More and more guidelines and tools appear in literature to manage projects in an agile manner. Yet, contractual guidelines suited for an agile approach in construction industry are currently missing. Ample research has been conducted on contracts for projects that use *conventional project management*, like the '*waterfall approach*'. But due to a different management style, agile project management may not be compatible with these existing construction contracts. This gap in knowledge resulted in the following research question.

How to effectively enable agile project management through construction contracts?

The scope of this research is the front-end development phase of construction projects between client – engineer, consultant or architect (hereafter referred to as *supplier*). The following activities were conducted to find an answer to the research question: *literature review, exploratory interviews, development of an agile contract proposal, validation and synthesis of the findings*.

Literature review

The literature review resulted in several key issues which should be addressed in an agile construction contract. These issues were coming forward by analysing the typical general terms and conditions for the construction industry – *The New Rules 2011 (DNR 2011)* – in perspective to agile project management. Next, because agile is 'born' in IT, agile IT contracts were studied for *best practices* which could be used for agile contracting in the construction industry. Additionally, **exploratory interviews** were performed at the company where this research was conducted: Arup Amsterdam. The aim of these interviews was to examine the practice of contracting and to support the findings of the literature review.

Several contractual concerns were found during the literature review and the exploratory interviews. These underpin the need for an agile construction contract. The main issues were caused by the agile philosophy of responding appropriately to change. Agile highlights that change should be embraced, instead of repelled. In order to respond to change, it is essential that there is no detailed specification upfront. Yet, this causes issues with conventional contracts which try to capture the end-result.

Development of an agile contractual proposal

An agile contractual proposal has been designed. This proposal is based on the *DNR 2011* in conjunction with findings derived from the *literature review* and the *exploratory interviews*. This document is split up in two sections: (1) an agile contractual proposal and (2) modifications to the *DNR 2011*.

The first section contains pre-conditions of an agile contract and recommendations for a contract that enables agile project management. The second section contains recommendations per article

¹ The online oxford dictionary (2016) describes agile as: "able to move quickly and easy." However, in this context it refers to '*agile project management*'.

of the DNR 2011 – that should be adjusted, added or deleted – to incorporate the recommendations of section one.

Validation

The recommendations in the proposal were validated by expert interviews. Outcomes of the validation were used to update the proposal. It appeared that – other than only contractual concerns – also other pitfalls should be overcome in the construction industry to apply agile project management. Firstly, the term agile is sometimes misused to sell projects or as excuse for disordered work. Secondly, the culture and the organisational structures of construction companies might not be ready yet.

Be that as it may, it is concluded that the contractual proposal of this thesis helps to set a baseline for an agile collaboration and to stimulate agile project management in construction projects.

Conclusion

The overall philosophy of agile project management is that projects cannot be specified completely upfront. Change is largely inherent to this agile approach; there is no detailed up-front scope description. This research has shown that the same applies to agile contracting. An agile contract cannot define requirements in detail up-front, but rather the processes, roles and responsibilities. This means: **an agile contract defines how parties will get to the end-result, rather than the end-result itself.**

This is done by embedding the principles of agile project management in the contract. Yet, if there is no basis of a fruitful relationship between parties, or if there is no fit with agile project management in terms of the (1) project, (2) organization and (3) resources, the chances of success may be too low to start the project in an agile manner.

Lastly, it is concluded that the DNR 2011 already provides flexibility to facilitate the agile project management. This made the DNR 2011 a suitable set of terms and conditions to tailor to recommendations of this research and consequently agile project management.

Application of this research in practice

The end-result of this thesis is the updated proposal. This proposal is added as a supplementary booklet. This proposal lays the foundation for agile contracting in the construction industry. Moreover, the proposed contract helps to outline the ground rules for further agile collaboration during a project.

This stand-alone document – ‘*Proposal for an Agile Contract*’ – can be found in appendix F of this thesis.

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Glossary

Agile	Literally means 'moving quick and lightly'. However, in the context of this thesis it refers to ' <i>agile project management</i> '.
Agile Project Management	An iterative, incremental method of managing the design and build activities of engineering, information technology and other business areas that is focused on new product development in a highly flexible and interactive manner (AXELOS, 2015).
AgilePM	AgilePM is an agile project delivery tool. AgilePM originates from software development.
Burndown Chart	Graphical representation of work left versus time.
Client	Person who ordered the product or project, the recipient of the product.
Consultant	Supplier of the product or project. Consultants are professionals who provide expert advice.
Daily Stand-up	Short daily meetings, usually between 5 to 15 minutes. Each person has two minutes to share information about what he/she is doing and the complications he/she is facing. The discomfort of standing for long periods is intended to keep the meetings short.
Minimum Marketable Product	The Minimum Marketable Product (MMP) is the smallest set of functionality that provides value to the market.
Minimum Viable Product	The Minimum Viable Product (MVP) is a product with just enough features to gather validated learning about the product and its continued development
Product Backlog	The Product Backlog is a list of all requirements that needs to be done in the project. These items can have a technical nature or can be user-centric (user stories). The list is prioritized. This is term is used in the tool Scrum.
Prioritised Requirement List	Same as the Product Backlog. This term is used in the tool AgilePM
Retrospective	An Agile retrospective is a meeting that's held at the end of a sprint. During the retrospective, the development team reflects on what happened during a sprint and identifies actions for improvement going forward (Computer Weekly, 2016).
Scrum	Scrum is an iterative agile development tool for managing product development. Scrum originates from software development.
Sprint	A sprint is a set period of time during which specific work has to be completed and made ready for review. The end-product of a sprint must add value to the project on itself.
Sprint Planning	Each sprint begins with a planning meeting: the sprint planning. During this meeting the team agree upon what exactly will be accomplished during that sprint (Sutherland & Schwaber, 2007).

Supplier	In this thesis the supplier entails: <i>Engineer, Architect and Consultant</i> .
The New Rules 2011	Legal relationship client – architect, engineer and consultant (DNR 2011).
Waterfall method	The Waterfall method is a development method that is linear and sequential. Waterfall development has separate goals for each phase of development. In this thesis this will be referred to as: <i>conventional project management</i> .

Abbreviations

APM	Agile Project Management
DCC	Dutch Civil Code (Dutch: Burgerlijk Wetboek)
DNR 2011	Dutch: De Nieuwe Regels 2011 English: The New Rules 2011
DSDM	Dynamic Systems Development Method (also known as AgilePM)
GTC	General Terms and Conditions
MBO	Dutch: Model-Basis Overeenkomst English: Standard form of Basic contract Explanatory notes on the Legal relationship client – architect, engineer and consultant DNR 2011
MoSCoW	Must have, Should have, Could Have and Would like but won't get.
MMP	Minimum Marketable Product
MVP	Minimum Viable Product
PM	Project Management
PPM	Programme and Project Management
PRINCE2	PRojects IN Controlled Environments 2
PRL	Prioritised Requirement List
RvA	Dutch: Raad van Arbitrage voor de Bouw English: Arbitration Board for the building industry
UAV-GC 2005	Dutch: Uniforme Administratieve Voorwaarden voor Geïntegreerde Contractvormen 2005
UAC-IC 2005	Uniform Administrative Conditions for Integrated Contracts 2005
WBS	Work Breakdown Structure

Chapter 1

Introduction

"Intelligence is the ability to adapt to change." - Stephen W. Hawking

1 Introduction

The first chapter of this thesis contains an overall introduction to the research. In the first paragraph (§1.1) the *introduction* to the problem will be given. In the subsequent paragraphs the description of the *research approach* (§1.2) and the *scope* (§1.3) will be discussed.

1.1 Introduction to the problem

This paragraph starts with the introduction to the subject and is followed by the research problem statement and context of this research.

1.1.1 Introduction to the subject

Many well-established guidelines and handbooks – that have become ‘standard’ in the field of project management – extensively describe project management tools (Project Management Institute, 2013; Nicholas & Steyn, 2012). Yet, despite these well-established guidelines and tools, many projects in the construction industry still cope with large cost overruns and delays (Flyvbjerg, Skamris Holm, & Buhl, 2003; Priemus, Rekveldt, & Giezen, 2013). Literature identifies several reasons for this phenomenon. One of these reasons is the way many projects are managed is not sufficient anymore to cope with some of the characteristics of projects themselves (Blom, 2014). These characteristics include an increase of project complexity and uncertainty due to constantly changing circumstances of projects (Flyvbjerg, Skamris Holm, & Buhl, 2003; Williams, 2005; Baccharini, 1996).

Conventional project management aims to reach predefined project goals that are formulated by criteria such as: scope, time, costs and quality (Atkinson R. , 1999). However, these ever changing circumstances make it very difficult to actually execute projects according to their initial plan. Over-detailed planning of projects, and especially expectations that are based upon these plans, become less appropriate (Koppenjan, Veenemeean, van der Voort, ten Heuvelhof, & Leijten, 2011).

Williams (2005) argues that project management should move to newer methodologies in which projects ‘emerge’ instead of being entirely pre-planned. Studies indicate the potential of flexible project management practices (Koppenjan, Veenemeean, van der Voort, ten Heuvelhof, & Leijten, 2011). *Agile project management* is one of these flexible project management approaches, and already has proven to be successful in the Information Technology (IT) industry (Rico, 2008; Shine, 2003). Agile project management is not only applicable in the IT industry, *agile* is already applied in a broad range of industries (Owen & Koskela, 2006). One of the conditions in creating an agile environment is making agreements on how projects should be carried out. These agreements should finally be transformed into contracts (Opelt, Gloger, Pfarl, & Mittermayr, 2013).

Even though the ‘*Agile Manifesto of 2001*’² states that “*customer collaboration goes over contract negotiation*” (AgileAlliance, 2001), in many agile projects a lot of time and effort is spent on negotiating contracts. This is because agile is fundamentally different from conventional project management on which currently most contracts are based (Opelt, Gloger, Pfarl, & Mittermayr, 2013). In the same vein Zijdemans and Stettina (2014) found that a new kind of contract is essential because contracts are one of the aspects that influence applicability of agile project management.

In spite of this, since agile is new in the construction industry, a view on *agile contracting* is missing in existing literature. At this moment only a few companies in construction use agile project management, but results are promising (Jalali Sohi, Hertogh, & Bosch-Rekveldt, in press; Owen R. , Koskela, Henrich, & Godinhoto, 2006).

² The agile manifesto describe a set of principles for product development. See sub-paragraph 2.1.2.

1.1.2 Research problem statement

Ample research has been conducted on contracts for projects that use conventional project management, like the *waterfall approach*. However, agile project management is new to the construction industry; due to a different management style, agile project management may not be compatible with existing construction contracts.

1.1.3 Research context and relevance

In this section – because agile project management originates from the IT industry – the development of agile within the IT next to the construction industry will be discussed. The text below will aim on the current situation of agile development in relation to the contractual problems in both industries.

Agile is founded in IT and introduced in construction industry

The term ‘*agile project management*’ was initiated by software developers in 2001. Prior to this, various ‘*agile tools*’³ became popular within IT industry. Nowadays, due to the successful track record of agile, it is becoming a standard management method in the IT sector (Opelt, Gloger, Pfarl, & Mittermayr, 2013; DSDM Consortium, 2015). Opelt, Gloger and Mittermayr (2013, p. 32) wrote: “*Companies that want to meet the requirements of dynamic markets are relying more and more on agile methods of software development.*”

Following the example of the IT industry, various analyses have been conducted to implement agile in the construction industry. Studies of *Solis Vuurman (2015)*, *Koskela, Henrich, and Godinhoto (2006)*, *Sohi, Hertogh, and Bosch-Rekvelde (in press)*, *Behceci and Homgren (2014)* and *Blom (2014)* have examined whether agile is applicable to construction industry. These studies concluded that, despite of the still limited use of agile project management, it could provide benefits. Time, money and human resources will be more effectively used. Due to shorter cycles and frequent reconciliation, major changes are prevented from occurring in the end of a stage. This means that agile methodologies could lead to a more satisfied client.

Also various engineering companies such as the Antea Group have started to apply agile project management in their recent projects (Blom, 2014). Arup⁴ – the engineering company where this research is conducted – also showed interest to implement agile project management. At the time of writing, Arup Amsterdam is training their Programme and Project Management (PPM) department to get familiar with agile project management.

Problems with conventional contracts in IT and indications of these problems in construction

IT Industry

An area where agile IT practitioners have difficulties in adhering to their own agile principles is contracting. Most clients demand fixed price, scope and time contracts. This gives them a feeling of control (Hoda, Noble, & Marshall, 2009), an attitude that will be a dilemma for agile practitioners. With these fixed contracts, both parties struggle with the problem of not knowing what is needed and how this will change during a project. Agile participants see these things as a threat to the ability of agile project management to succeed and reach its full potential (Hoda, Noble, & Marshall, 2009;

³ *Agile tools* are different kind of frameworks to apply agile project management. (E.g.: Scrum, AgilePM, Extreme Programming, Kanban and many more.)

⁴ *Arup* is a British multinational professional services firm headquartered in London which provides engineering, design, planning, project management and consulting services for all aspects of the built environment. The firm has over 12,000 professionals based in 92 offices across 42 countries, and is present in Africa, the Americas, Australasia, East Asia, Europe and the Middle East (Arup, 2016).

Opelt, Gloger, Pfarl, & Mittermayr, 2013). They are divided between the client's need for certainty, and their own *agile attitude* of 'responding to change' (Nerur, Mahapatra, & Mangalaraj, 2005). As Opelt et al. (2013, p. 32) state: "*While development teams using agile methods are already presenting impressive results, the benefits of agile development are still not obvious to many buyers. Therefore, agile-developed products and projects are often grouped into inappropriate 'traditional' contract constructs.*" This is cause for a continuous ignorance of the cherished agile principle of cooperation between clients and suppliers in traditional contracts. It would suggest that clients and suppliers do not always have a successful project in sight, but rather, their own advantage.

Construction Industry

Construction processes are largely dependent on effective contract preparation since these are one of the major causes of construction disputes (Podvezko, Mitkus, & Trinkuniene, 2010; Hoda, Noble, & Marshall, 2009) (Odeh & Battaineh, 2002). The paper '*Scrum in practice in infrastructure projects*' written by Jalali Sohi, Hertogh and Bosch-Rekvelde (in press) reveals that project managers in the construction industry express their concerns about current contracts while using agile project management. These concerns are not surprising, considering the broad discussion among experts about agile contracting in the IT industry.

New agile contracts in IT, however no contractual framework in construction industry

Walter Jaburek⁵ addressed in an interview conducted in 2012 by Opelt et al. (2013, p.48): "*If agile methods are used, this should of course be reflected in the contract*". This research also shows lawyers reporting these contractual problems in the IT industry. Different kind of '*agile contracts*' have been developed for the IT since then.

However, as addressed before, this step has not been taken in the construction industry. This does not necessarily mean that a totally new type of contract is needed, but rather the *evolution* of existing contracts in the construction industry. This possibly denotes that all the 'contacting techniques' exist – and even are well documented – but that we have to find out how to (re-)design such a contract for agile project management (Opelt, Gloger, Pfarl, & Mittermayr, 2013; Kelley, 2008).

⁵ *Walter J. Jaburek* is a Doctor of Informatics and Law, and is a lecture at Austrian universities on these topics.

1.2 Research approach

This thesis is focussed on answering the main research question. This research question is based on the research problem statement and context, which is described in the previous paragraph. In this paragraph the research question, research objectives and research design will be discussed.

1.2.1 Research question

The main research question of this thesis is formulated as follows:

How to effectively enable agile project management through construction contracts?

To answer the main research question, sub-questions have been formulated:

1. *What are the differences between conventional- and agile project management?*
2. *What are the concerns – in perspective to agile project management – with existing construction contracts?*
3. *What are the best practices from agile IT contracts, which can be of interest for agile construction contracts?*

1.2.2 Research objective

The research objective of this thesis is to contribute to project management knowledge in the construction industry. This is done by examining contractual agreements in perspective to agile project management. This is not only interesting because no research has been conducted on agile contracting in construction industry yet. Also, the approach of flexible project management itself requires a fundamentally different approach on what should be agreed upon in the first place (Cobb, 2011).

In other words: *the research objective is to find a way to capture agile construction projects in an appropriate contract form.*

1.2.3 Research design and thesis outline

In this section the research design and outline of this thesis will be discussed. This thesis is divided into six chapters. The content of these chapters and the research design is illustrated in figure 1.1.

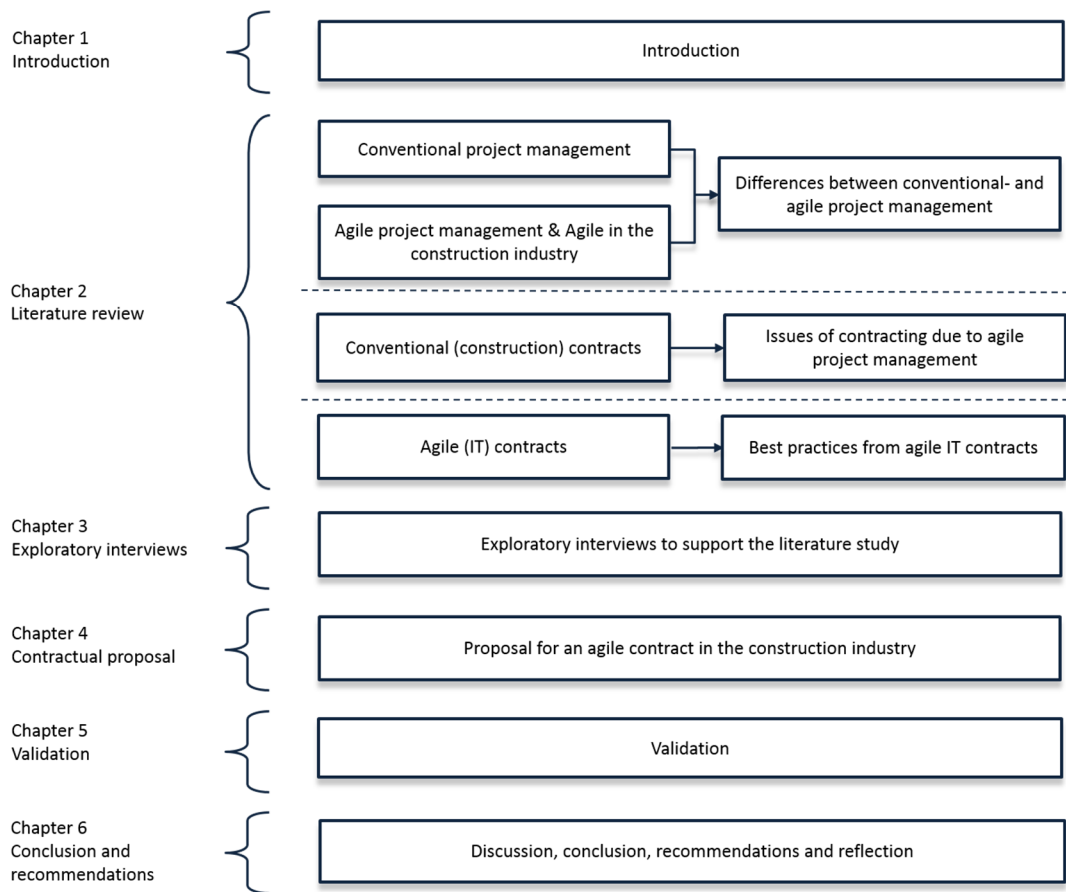


Figure 1.1 Outline and research design (own illustration).

Chapter 1 – Introduction

Chapter 1, which is the current chapter, contains an introduction to the research of this thesis.

Chapter 2 – Literature review

The literature review will lay the foundation of this research. The literature review must give an answer to the three sub-questions. In each paragraph, a sub-question is examined. This results in the following three paragraphs:

- *Project management (§2.1)*
In this paragraph, *conventional-* and *agile project management* will be discussed. It will be explained what is meant by both methodologies and what these methodologies entail. Because agile project management is relatively new in the construction industry, also the applicability of agile in construction is studied. To conclude, an answer is given to the first sub-research question: the differences will be expounded between conventional- and agile project management.
- *Contracts in perspective to agile project management (§2.2)*
In this paragraph, contracts in general and contracts typical for the construction industry will be discussed. It will be investigated which issues occur with conventional contracts due to agile project management. This will be the answer to the second sub-research question.

- *Agile IT contracts (§2.3)*

Since agile is developed in the IT industry, the assumption is made that the IT industry is relatively further in the development of agile contracting. Therefore, best practices of these agile IT contracts will be described. These best practices can help to develop an agile construction contract and are an answer to the third sub-research question.

Chapter 3 - Exploratory interviews⁶

Exploratory interviews will be performed to support the finding of the literature study and to get a better understanding of the practice. These interviews will be with experts in the field of contracting and project management. The interviews will be conducted at *Arup Amsterdam*, and *The Product Owners*. The Product Owners is an IT company which is specialised in agile software development. This makes it possible to get a broader view of agile contracting and agile project management.

Chapter 4 – Research findings⁶

Based on the data of the literature study and the exploratory interviews, a proposal for an agile construction contract will be developed.

Chapter 5 – Validation⁶

In this chapter the recommendations for an agile construction contract will be validated. This will be done by expert interviews. These results will be examined and – if necessary – the recommendations of chapter 4 will be revised using the outcomes of the validation.

Chapter 6 – Conclusion and recommendations

Finally, all findings will be synthesized into the conclusions and recommendations of this thesis.

⁶ The methodology of chapter 3, 4 and 5 will be further explained in those chapters.

1.3 Scope

The scope⁷ of this research consists of three different components. In the following section these three components will be discussed.

Front-end development

The *Project Management Body of Knowledge* (PMBOK) guide states that five phases can be distinguished in a project's lifecycle, namely: *project conception and initiation*; *project definition and planning*; *project launch or execution*; *project performance and control*; *project close* (Project Management Institute, 2013). This research will focus on first two phases: *project conception and initiation* plus *project definition and planning*. Henceforth, these two phases will be referred to as: '*front-end development*' (FED). The three main reasons for this choice are explained below:

- Firstly, this research looks at the IT industry because it is assumed that the IT already has profound experience with agile contracting – for better or for worse. The IT industry is unquestionably different from the construction industry. However, the front-end development (FED) phase of both industries are reasonably similar (Blom, 2014).
- Secondly, in the construction industry, the execution phase differs from the FED phase in some significant ways. During the execution phase it is harder to keep the design flexible than during the FED phase. In the execution tangible materials and machinery are used, that often have to be ordered up front. This inflexibility makes the execution phase less suitable for agile project management (Behceci & Holmgren, 2014).
Moreover, execution usually has a great number of participants in the form of sub-contractors and workforces. Due to the addition of the different (sub-) contractors, there is a wider range of inconsistency of employees and employers (Koskela & Howell, 2002). This also means that the professional qualifications of people involved in the execution differ a lot. This inconsistency of employees and different professional qualifications can cause cultural problems in self-managing (agile) teams. Thus this can give problems in applying new management methodologies as agile project management (and agile contracts) (Owen R. , Koskela, Henrich, & Godinhoto, 2006).
- Thirdly, a number of studies has shown that the FED is vital for the project performance (Lessard & Miller, 2013; Josephson, 2009). Research shows that FED has a relatively high impact on the actual costs of a project (Bosch-Rekvelde, 2011). This means that defects in the FED will cause lots of extra cost further down in the project. (Artto, Lehtonen, & Saranen, 2001; Flyvbjerg, Bruzelius, & Rothengatter, Megaprojects and Risk. An Anatomy of Ambition, 2003). Hence, by managing the uncertainty in the FED phases in a proper way, the project performance will theoretically increase. This is interesting, because responding to change and therefore managing uncertainty is one of the principles of agile project management (Blom, 2014).

Client – Engineer, Architect and Consultant

This research is conducted within the company Arup Amsterdam. Arup is an independent British multinational firm (headquartered in London) of *engineers, architects and consultants* that offers a broad range of professional services for the construction industry (Arup, 2016).

This research will draw conclusions using the data and knowledge of people working at Arup. Therefore, the legal relationship between Arup and her clients will be the scope of this research. Henceforth, *engineer, architect and consultant* will be referred to as: '*supplier*'.

⁷ The online Oxford dictionaries describe a scope as: "... the extent of the area or subject matter that something deals with or to which it is relevant ..."

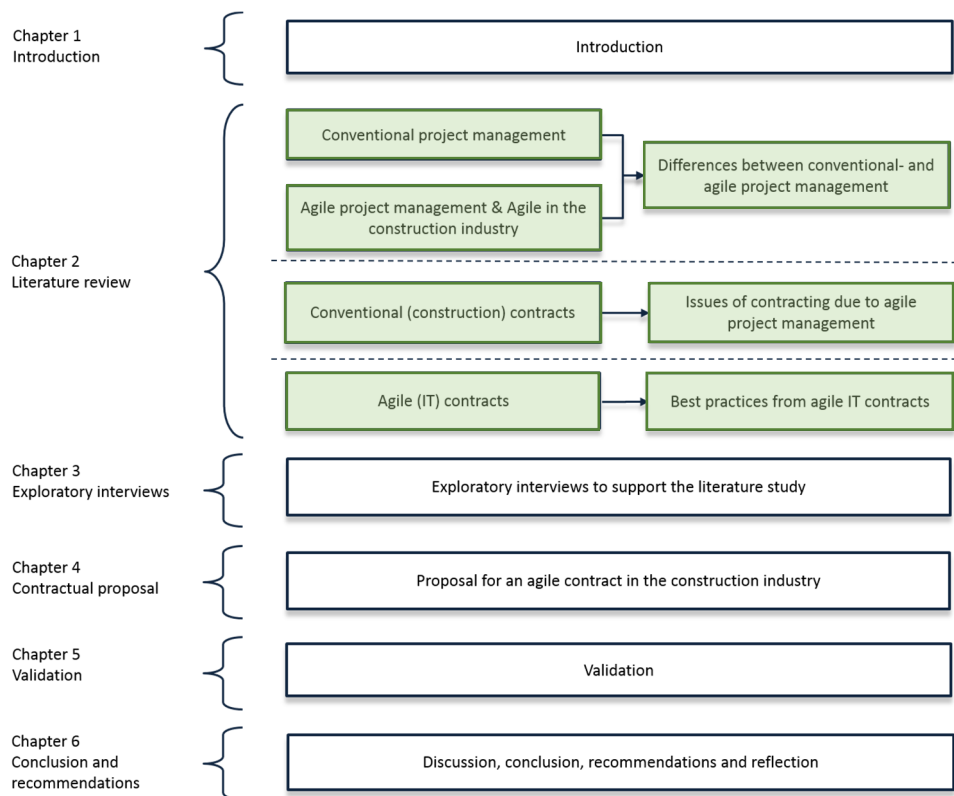
Private sector (and public sector)

This research is mainly focussed on the private sector. This is because the European tender procedures⁸ do not apply to this sector. European tender procedures may pose difficulties for the applicability of agile project management; because agile projects cannot clearly be defined up-front. However – if clients take agile project management into account – it is assumed to be possible to write an *'agile tender'* while following the European tender procedures.

⁸ *European tender and contract award procedures* are a set of legal rules that have to be followed within the EU. EU directives on public procurement cover tenders that are expected to be worth more than a given threshold.

Chapter 2

Literature review



"The key to success is often the ability to adapt." - Anthony Brandt

2

Literature review

This chapter contains the literature review of this thesis. The literature review must provide an answer to the three sub questions of this research. This chapter will consequently consist of three paragraphs: §2.1 *Project management*; §2.2 *Contracts in perspective to agile*; and §2.3 *Best practices from agile IT contracts*. Each paragraph will start with an overview of the research framework to illustrate the upcoming content of the paragraph.

2.1 Project management

In this paragraph project management will be discussed. In figure 2.1 the blue rectangle highlights the structure and contents of this first paragraph. The aim of this paragraph is to find an answer to the first sub question of this study: *What are differences between conventional- and agile project management?*

Firstly, conventional project management (§2.1.1) will be discussed. The following section details an explanation of agile project management in general and agile project management in the construction industry (§2.1.2). Henceforth the differences between conventional and agile project management will be described (§2.1.3). To conclude, the last sub-paragraph contains a summary of the main differences (§2.1.4).

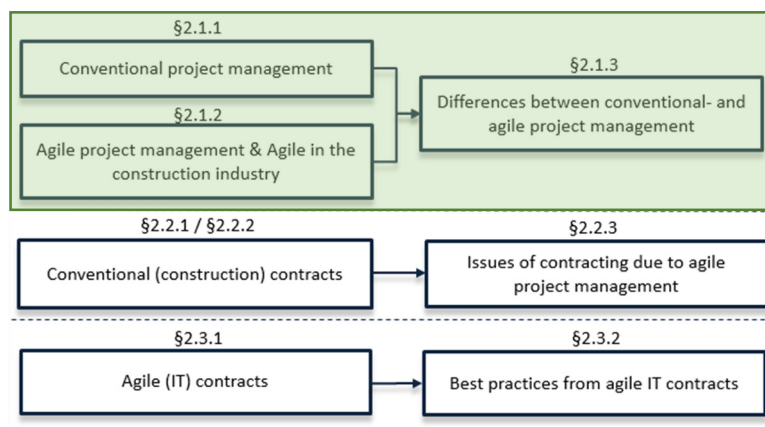


Figure 2.1. The content of the paragraph 2.1 (own illustration).

Project management in general

What is project management exactly? To answer this basic question, a clear definition of the term project is required. The Project Management Institute (2013, p. 5) states: “A project is a temporary endeavour undertaken to create a unique product, service or result.” This means:

- A project is **temporary**; it has a defined beginning and end in time. Traditional projects often have a defined scope and resources; this way projects are often seen as more ‘plannable’.
- A project is **unique**; it is not a routine operation, but a specific set of operations to accomplish a singular goal.

A full description of project management is provided by the Project Management Institute (2013, p. 8): “Project management is the application of knowledge, skills, tools and techniques to project activities to meet the project requirements”. Numerous definitions for the term ‘project management’ are described in existing literature. But almost all of them (e.g.: IPMA, ISO21500:2012, APM, BS6079:2010) describe the same: the application of tools such as planning and control to meet project objectives. The Construction Industry Council (CIC) (2016) adds to this: “The primary goal of project management is to add value⁹ to the process of delivering construction projects”.

⁹ Value is a measure of the benefit provided by a good or service, in this case a construction project. This can be measured in a monetary value, but also in customer-perceived value, functional value, social value and psychological value.

Project management has changed over time and can be split up in three phases:

(1) Before the 1950's, management for each project was custom made. This is considered as the first phase of project management.

(2) The second phase is how we know project management today. It has emerged from the 1950's and onwards and has its roots in the defence and aerospace technology (Blom, 2014; Wysocki, 2009) During this phase more standard approaches were documented by institutes such as Project Management Institute (PMI) (Project Management Institute, 2013) and International Project Management Association (IPMA).

(3) From the 1990's and onward, a new and third phase has been identified in project management. Due to a faster changing and dynamic environment, the demand for new approaches increased (Blom, 2014; Bosch-Rekvelde, 2011). Agile project management was developed as a response to this demand. This method tries to cope with an ever-changing and dynamic environment.

In the next sub paragraph (2.1.1), this thesis will start by analysing conventional project management known as phase two. The third phase of agile project management will be explained in subsequent paragraph (2.1.2).

2.1.1 Conventional project management

During the second phase of project management (from the 1950s and onwards), conventional project management tools and methods were developed. Typically, these can be seen as linear approaches and often are referred to as the *waterfall model*. Hence, when referring to conventional project management in this research, the waterfall model is meant.

The waterfall model is divided into a sequence of distinct phases, such as: *initiation, planning, executing, monitoring and controlling, and closing*. For each of these five project steps, there are tools and techniques, such as the ones defined by the *Project Management Body of Knowledge* (PMBOK), which is one of the methodologies for conventional project management that works with these phases (Project Management Institute, 2013). Another well-known methodology is *Project in Controlled Environments, version 2* (PRINCE2) (PRINCE2, 2016), but organizations have also developed their own methodologies.

All these methods depend heavily on tools such as Gantt Charts and Work Breakdown Structures (WBS). These tools are focused on pre-defining the scope, mostly followed by extensive scope management (Wysocki, 2009). It predetermines – by extensive front-end analysis – the time, cost and quality, which should be frozen and strictly controlled (Blom, 2014; Koppenjan, Veenemans, van der Voort, ten Heuvelhof, & Leijten, 2011).

This frozen scope means that few scope change requests are wanted. When looking at figure 2.2 it is not surprising that the conventional way of project management is focused on excluding these changes to create a predictable environment. At the beginning of a project, changes in the project can be implemented at low cost (and time). However, changes are becoming much more expensive once the project evolves further. This is illustrated in figure 2.2. This also means that the front-end development is a very important phase, because during this phase the whole project is planned (Ernst & Young, 2016).

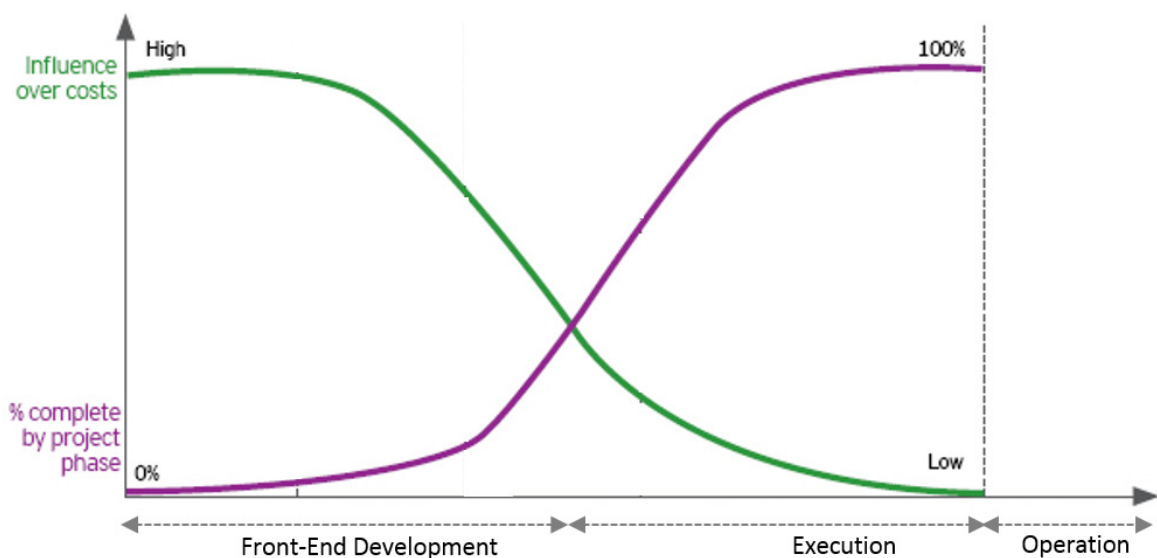


Figure 2.2. Ability to influence total scope and cost over the project lifecycle (based on: (Ernst & Young, 2016)).

Wysocki (2009, p. 344) summarizes the following characteristics of the waterfall model:

- Complete and clearly defined goal, solution, requirement, functions and features.
- Few scope change requests.
- Routine and repetitive activities.
- Use of established templates.

2.1.2 Agile project management

In this section agile project management will be discussed in depth. Since the 1990s, there is an increasing awareness of the ever changing and dynamic nature of project environment. Due to this, it becomes almost impossible to make reliable predictions about the end-result (scope) of a project (Bosch-Rekvelde, 2011). However, making predictions is an important requirement of conventional project management. In order to fill this gap, new methods are focussing on designing a management tool that allows change and a dynamic environment. In the late 1990's, various new management tools began to receive public attention (e.g. Scrum, Kanban, Extreme Programming, AgilePM, SAFe, Crystal etc.). Each tool consisted of a different combination of old and new ideas. These tools were emphasizing aspects such as close collaboration; frequent delivery of value; and tight and self-organizing teams (AgileAlliance, 2001).

The term '*Agile*' was coined on the 13th of February 2001 at 'The Lodge' in Snowbird, Utah, USA. Here, seventeen software developers – who represented these new management tools – came together. Together they came up with the name '*Agile*' and composed the '*Agile Manifesto*'. Agile can be seen as an umbrella name for different management tools such as Scrum, Kanban, Extreme Programming, AgilePM, SAFe, Crystal etc. Agile is a generic style of working and is focused on (DSDM Consortium, 2015): flexibility; working closely with customers throughout the project; ensuring final solution actually meets business need; deferring decision about detail until last responsible moment¹⁰. Jim Highsmith (2002), who is one of the seventeen founders of the agile manifesto, states: "*Agility is the ability to balance flexibility and stability.*"

After the *Agile Manifesto* was written in 2001, a group of notable project managers came together to discuss what management principles might be required to achieve this '*agility*'. This is called the *declaration of interdependence*. Together with the *Agile Manifesto* of 2001, Highsmith (2009) sees these two texts as the core values of agile project management.

To better understand the core values of agile, the following paragraphs are aimed at examining these core texts.

Agile Manifesto of 2001

The '*Agile Manifesto of 2001*' contains four values which form the foundation of agile. The textbox below shows the agile values (AgileAlliance, 2001). After this textbox, each value will be discussed separately.

"We are uncovering better ways of developing [products] 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, an agile work style values the items on the left more."

¹⁰ "*Respond at the last responsible moment*", is a typical agile saying. It means that decisions are taken at the instant in which the cost of the delay of a decision surpasses the benefit of delay; or the moment when failing to take a decision eliminates an important alternative.

“Individuals and interactions over processes and tools”

Yes, teams with proper tools and processes can be very productive. Nevertheless, this is by no means more essential than individuals and their interaction among each other. Agile believes it is crucial that all team members and stakeholders communicate and collaborate to deliver products. Ideas must be exchanged constantly. This way self-organizational teams are possible: *“For self-organization, it is essential to respect and recognize that individuals differ from each other”* (Opelt, Gloger, Pfarl, & Mittermayr, 2013, p. 7).

“Working software over comprehensive documentation”

This means no wasting time on useless documentation. The documentation is not the end-product, working products are considered as the real value of the project (Opelt, Gloger, Pfarl, & Mittermayr, 2013).

“Customer collaboration over contract negotiation”

Obviously, this does not mean that contracts are not important anymore. You need contracts and agreements to define how you want to collaborate, how payments should proceed, and so on. Contracts can set a baseline and a mutual understanding about the scope of the project, and how the project should be carried out (Wysocki, 2009).

“Responding to change over following a plan”

Change is seen as an opportunity to add value to end-products. Not all change can be incorporated in projects, but projects must respond to it. The agile way of working cannot be confused with methods as *‘cowboy coding’*. Cowboy coding is sometimes wrongly associated with an agile way of working. Cowboy coding is not a specific method, rather team members do what they think what is good. However, with agile project management there is always a plan (Opelt, Gloger, Pfarl, & Mittermayr, 2013):

- on the level of the vision;
- on the level of the road map;
- on the level of release;
- on the level of sprints and iterations;
- on the level of daily work.

Each of these planning details has its own methods, techniques and visualization tools. Or as Opelt (2013, p.11) describes: *“Not having a plan is not an option”*.

Declaration of interdependence

While agile project management is developed by software developers, an agile approach is not only applicable in the IT industry (Owen & Koskela, 2006). In 2005, a group of project managers came together to discuss the management principles that might be required to achieve this *‘agility’* in other industries. The textbox below illustrates the six values they came up with (Declaration of Interdependence , 2016).

- *“We **increase return on investment** by making continuous flow of value our focus.*
- *We **deliver reliable results** by engaging customers in frequent interactions and shared ownership.*
- *We **expect uncertainty** and manage for it through iterations, anticipation, and adaptation.*
- *We **unleash creativity and innovation** by recognizing that individuals are the ultimate source of value, and creating an environment where they can make a difference.*
- *We **boost performance** through group accountability for results and shared responsibility for team effectiveness.*
- *We **improve effectiveness and reliability** through situational specific strategies, processes and practices.”*

Agile tools: Scrum and AgilePM

Since agile project management is not a tool on itself but rather an ‘umbrella name’ for different management tools, two agile tools will be described in-depth: Scrum and Agile Project Management (AgilePM)¹¹. These tools will also make agile project management more tangible. Scrum is often used for product development, while AgilePM states to be ideal for project management. Scrum is probably the most known tool for agile product development. Of all agile frameworks used by companies, 66 percent is Scrum (ScrumAlliance, 2011). AgilePM is the agile tool that Arup Amsterdam is starting to use.

Scrum

In 1986, Nonaka and Hirotaka Takeuchi, published a research in the *Harvard Business Review*. This research showed that projects with small multidisciplinary teams historically deliver the best result. In response to this Jeff Sutherland developed ‘*Scrum*’ in 1993. He worked together with Ken Schwaber, who was simultaneously applying Scrum in his IT company. Together they developed Scrum to how we know it today. In 1995 they presented Scrum at the OOPSLA¹² conference (Schwaber & Sutherland, 2014). The name Scrum is derived from rugby. Within rugby teams there are different disciplines, and together they try to reach one goal: winning the game. Collaboration is very important and the team must be able to respond swiftly to changing circumstances.

Scrum can be seen as a development approach that allows teams to choose themselves the amount of work to be done and how to do it (Sutherland & Schwaber, 2007). Scrum is developed to give teams freedom so that the talents of all team members are used. Because of this responsibility, teams feel more ownership of the products they develop and the performance increases. As Opelt, Gloger, Pfarl and Mittermyr (2013, p13) write: “*In Scrum, we assume that intelligent people have a fundamental interest in contributing their ideas to improving things or even to develop new things*”. Scrum only entails a few rules and principles which are all in accordance to the agile manifesto, and these must be followed strictly. Scrum is based on three main principles: (1) transparency, (2) inspection, and (3) adaption.

With Scrum the requirements are described as ‘*user stories*’. User stories are also used in Scrum and other agile tools. A user story is a brief description (story) of the functionality that a user wants in the end-product. This can be some phrases written in everyday language, which describe what the user ‘wants to do’ with the product. It will describe ‘who’, ‘what’, ‘why’. This must be in little detail and should fit on a post-it. This is the manner in which the final user has influence on the functionality of the end-product.

The user stories are brought together in short cycles or work packages: ‘*sprints*’. Scrum delivers value after each sprint; these are time boxes of maximum four weeks. Scrum has three roles, three ceremonies and three artefacts that come together in these sprints (Sutherland & Schwaber, 2007):

<i>Roles:</i>	<i>Product Owner, ScrumMaster, Team</i>
<i>Ceremonies:</i>	<i>Sprint Planning, Sprint Review and Daily Scrum</i>
<i>Artefacts:</i>	<i>Product Backlog, Sprint Backlog and Burndown Chart</i>

Figure 2.3 on the next page shows the process of a sprint. First a ‘*Product Backlog*’ is created. This backlog entails all the requirements of the client in prioritised order, the capacity of the project team, and previous performances of the development team. The ‘*Product Owner*’ defines the features of the product and prioritizes these features together with the client according to their market value. From the product backlog the requirement with the highest priority is chosen, which is the requirement that will be built during the following sprint. This process makes sure that

¹¹ *Agile Project Management* (AgilePM) is formally known as *Dynamic Systems Development Method Atern* (DSDM Atern). The new name can be quite confusing, but AgilePM is a tool of agile project management, just like Scrum.

¹² *OOPSLA* is an abbreviation of *Object-Oriented Programming, Systems, Languages & Applications*

requirements with the highest value will be delivered first (Schwaber & Sutherland, 2014). At the end of the project the client will receive a product which is evolved due to a dynamical prioritization, instead of a product that is agreed upon in beginning (Owen R. , Koskela, Henrich, & Godinhoto, 2006).

Planning of a sprint is called the '*Sprint Planning*'. During this planning a '*Sprint Backlog*' is created, which is similar to a product backlog, but only focused on the sprint itself. During a '*Daily Scrum*', which is a short daily meeting, a detailed daily planning is created. During this daily meeting, team members appoint their own tasks. This must increase their commitment.

The '*Scrum Master*' ensures that the team is working in accordance with the Scrum principles. The '*Team*' should exist around seven (plus or minus two members) and specifies the work and organizes itself and divide the work. They have the right to do everything within the boundaries of the project guidelines, in order to reach the goal of a sprint. Each sprint produces a '*deliverable*' (that must contain market value on itself). Together these form the solution/end-product (Schwaber & Sutherland, 2014).

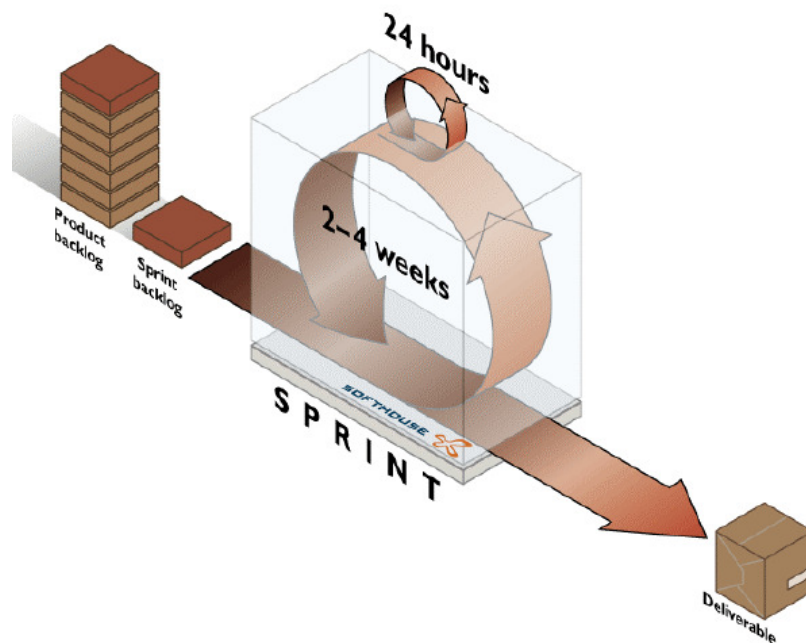


Figure 2.3. Sprint cycle using Scrum (Sutherland, 2006, p. 12).

Agile Project Management (AgilePM)

AgilePM is based on the agile values and shares a lot of similarities with Scrum. However, AgilePM claims to focus on projects instead of only products. Since Scrum is primarily designed for only product development, this thesis will also discuss AgilePM.

The AgilePM handbook recommends to fix cost, quality and time while leaving the scope variable (DSDM Consortium, 2015). Like Scrum, AgilePM prioritizes requirements (user stories) which together form the scope. The '*MoSCoW*'¹³ technique is used for this prioritization. By repeatedly prioritizing the project requirements into *musts*, *should*, *could* and *won't have*s it creates

¹³ *MoSCoW* is an acronym derived from the first letters of the four prioritization categories (Must have, Should have, Could Have and Would like but won't get).

contingency to meet the time, cost and quality constraints. If the project delays for whatever reason, the least valuable requirements will fall away first.

Project lifecycle

AgilePM provides iterative and incremental processes, with a total of six lifecycle phases. The lifecycle can be seen as a mixture of elements of conventional project management (e.g. PRINCE2, PMBOK) combined with agile project management. It combines project management and product development into a single process (DSDM Consortium, 2015).

Figure 2.4 shows the project lifecycle of an AgilePM project. During the (1) **pre-project** phase it is determined if the right projects are started within a portfolio of the client. It is contemplated if projects are set up correctly and have a clear objective. The (2) **feasibility phase** which follows, is to investigate if the project is likely to be feasible from a technical and business perspective.

The (3) **foundation phase** takes the feasibility phase to the next level. In this phase a fundamental – but not detailed – understanding of the rationale of the project will be created. The development and delivery of the solution is devised. Low levels of detail must be avoided. Details are left for the next phase. The aim is to just understand the scope, and in broad terms: how it will be carried out by who, where and when. For large projects this phase can be done multiple times throughout the project (and updated continuously).

The (4) **evolutionary development phase** can be seen as the development phase. In this phase different agile tools come in, such as: *iterative development*, *timeboxing*, *MoSCoW prioritisation*, *workshops*, and so on. During this phase the solution is developed: iteratively exploring the low-level detail of the requirements and testing continuously as the project moves forward.

The objective of the (5) **deployment phase** is to bring the result of the evolutionary development phase into operational use. And as last, the (6) **post project** phase checks how well the expected business benefits have been met (DSDM Consortium, 2015).

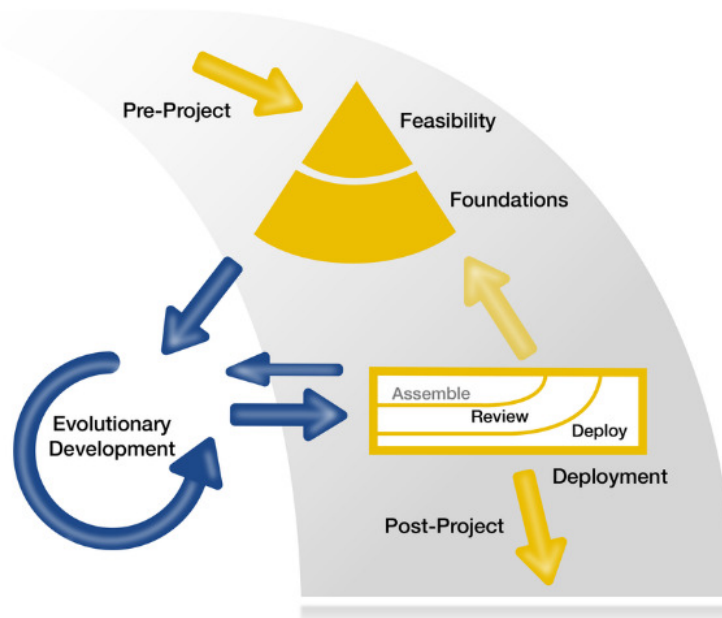


Figure 2.4. Project lifecycle using AgilePM (DSDM Consortium, 2015, p. 28).

Agile project management in the construction industry

The previous sections explained what agile project management entails, this section will discuss agile project management in perspective to the construction industry.

Daneshgari (2010, p. vii-viii) defines agile construction as an “[...] *engineered process designed to respond to the owner’s and general contractors’ specific needs to become more efficient, more productive, and, ultimately, more profitable. Time, cost, and quality are the focus of the Agile Construction process design. Agile construction exemplifies the following characteristics: Visibility, Responsiveness, Productivity, and Profitability.*”

Not much literature is available about agile project management in the construction industry. Owen et al. (2006) state in their paper ‘*Is Agile Project Management Applicable to Construction?*’ that agile project management has a good potential for the initiation and design phase of construction. They see potential for planning the construction execution but not for managing it on site. Likewise, Behceci and Holmgren (2014) conclude in ‘*Agile Perspectives in Construction Projects – How to Improve Efficiency in the Design Phase*’ that agile methodologies could improve efficiency in the program- and system stages. The paper explains that working in short iterative cycles gives the opportunity to have more frequent reconciliation with the client, as well as with the project team. This is resulting in more opportunities for clients to make positive changes throughout projects. This can be cost effective, because size and therefore cost of making unwanted changes decreases if changes are made continuous instead after the fact. Besides, it can be an increase in client satisfaction. Correspondingly, Sohi, Hertogh and Bosch-Rekvelde (in press) reason in their paper ‘*Scrum in practice in infrastructure projects*’ that agile (Scrum) could contribute to project success in construction projects.

Arup Amsterdam has trained half of the Programme and Project Management (PPM) department with the agile tool AgilePM. The ‘*Agile Project Management Handbook v2*’ written by *DSDM consortium*¹⁴ describes practically how to apply these agile principles. The DSDM handbook labels AgilePM as a generic project management method. Both the tools which are described in this thesis (Scrum and AgilePM) claim that these tools are applicable to all kind of industries. Yet, they do not give practical examples for the construction industry.

In conclusion, at this moment, agile is applied to a limited extent in the construction industry and therefore there is not much literature available. Few papers describe applying agile to construction and hardly any discuss the practical applicability (Maylor, 2010; Ribeiro & Fernandes, 2010). Nevertheless, Blom (2014) and Owen, Koskela, Henrich and Codinhoto (2006) explain that the fact that agile tools are currently not commonly used in the construction industry does not mean agile cannot be successful or applicable.

¹⁴ *DSDM Consortium* is a bit-for-profit organisation to manage the sharing, exploitation and evolution of the intellectual property of DSDM (DSDM Consortium, 2015).

2.1.3 Conventional- vs. agile project management

The previous two sub-paragraphs discussed conventional- and agile project management. This sub-paragraph details a more in-depth comparison on the differences between both project management methods. An overview of the dissimilarities between the project management methods will be presented in a table. The most crucial differences will be discussed further in this section.

Table 2.1 summarizes the differences between conventional and agile project management. These differences are derived from the literature which is also used in the previous two sub-paragraphs. The specific literature from which each dissimilarity is derived is mentioned in the last column.

Table 2.1. (own table based on (Nerur, Mahapatra, & Mangalaraj, 2005, p. 75; Blom, 2014; Wysocki, 2009; Highsmith J. , Agile Project Management , 2009; Opelt, Gloger, Pfarl, & Mittermayr, 2013; Schwaber & Sutherland, 2014)

	Conventional PM	Agile PM	Source
<i>Fundamental Assumption: 'respond to change'</i>	Projects are fully specifiable, predictable, and can be built through meticulous and extensive planning. Resist to change.	Projects can be developed by small teams using the principles of continuous design improvement and testing, based on rapid feedback and change. Respond and embrace change, change can add value to the project.	(Owen R. , Koskela, Henrich, & Godinhoto, 2006, p. 57) (Nerur, Mahapatra, & Mangalaraj, 2005, p. 75) (Arbogast, Larman, & Vodde, 2012) (Schwaber & Sutherland, 2014)
<i>Focus of project delivery</i>	Focus on controlling the process. The product progress is recorded weekly.	People centric, people decide what is best for the project. The product progress is recorded every day (e.g.: Burndown chart).	(Wysocki, 2009) (Opelt, Gloger, Pfarl, & Mittermayr, 2013) (Schwaber & Sutherland, 2014)
<i>Management Style</i>	Command-and-control. Vertical organization.	The project manager should show a facilitating and collaborating leadership style. Horizontal organization.	(Owen R. , Koskela, Henrich, & Godinhoto, 2006, p. 55) (Nerur, Mahapatra, & Mangalaraj, 2005, p. 75) (Zijdemans & Stettina, 2014) (Wysocki, 2009)
<i>Knowledge Management</i>	Explicit, extensive guidelines (of processes).	Tacit, meaning the management style should be understood without being stated.	(Nerur, Mahapatra, & Mangalaraj, 2005, p. 75)
<i>Role Assignment</i>	Individual and specialization.	All members show leadership-and-collaboration, self-organizing teams and encourage role interchangeability.	(Owen R. , Koskela, Henrich, & Godinhoto, 2006) (Nerur, Mahapatra, & Mangalaraj, 2005, p. 75)
<i>Teams and collaboration</i>	Individual and teams organized per subject. Build a team on availability of people. Project roles and people change during the project. Could be very large.	Every relevant discipline is involved in the team. The same roles and people are represented during the whole project. Usually less than 15. Moreover, Wysocki (2009) describe that the experience level of team members in an agile team should	(Owen R. , Koskela, Henrich, & Godinhoto, 2006) (Opelt, Gloger, Pfarl, & Mittermayr, 2013) (Schwaber & Sutherland, 2014) (Wysocki, 2009)

	Teams can be distributed over different locations.	be more senior or at least 'most skilled'. Co-located teams are important.	
<i>Communication</i>	Formal meetings (on a weekly or bi-weekly basis). If a problem occurs, the project manager gets informed.	Informal meetings (on a daily basis, e.g. daily stand ups). If a problem occurs, the whole team gets informed. Information is available and easily visible for everybody.	(Boehm & Turner, 2009) (Owen R. , Koskela, Henrich, & Godinhoto, 2006) (Nerur, Mahapatra, & Mangalaraj, 2005, p. 75) (Schwaber & Sutherland, 2014)
<i>Customer's Role</i>	The customer's role is important: often the client is ONLY informed about the progress of the project.	The customer's role is critical: the client is attending meetings and supposed to give feedback every time.	(Nerur, Mahapatra, & Mangalaraj, 2005, p. 75) (Zijdemans & Stettina, 2014)
<i>Project Cycle</i>	Guided by tasks or activities.	Guided by requirements and user stories.	(Nerur, Mahapatra, & Mangalaraj, 2005, p. 75) (DSDM Consortium, 2015)
<i>Planning/schedule</i>	Planning/schedule is made by the project manager. The planning is a static document.	All team members (client, engineers, PM, etc.) are involved in making the planning. The planning is a 'living document', if needed it can change during the project. The end-date can be fixed.	(Owen R. , Koskela, Henrich, & Godinhoto, 2006) (Sutherland & Schwaber, The Scrum Papers: Nuts, Bolts, and Origins of an Agile Process, 2007)
<i>Deliverables</i>	Detailed specifications.	User stories define what the client wants.	(Highsmith J. , Agile Project Management , 2009) (DSDM Consortium, 2015)
<i>Development Model</i>	Life cycle model (Waterfall, Spiral, or some variation).	The evolutionary-delivery model. The project cycle guided by project features, each batch will add value on its own. Together with the client a prioritizing is made of the deliverables. This is changing during the project.	(Owen R. , Koskela, Henrich, & Godinhoto, 2006) (Nerur, Mahapatra, & Mangalaraj, 2005, p. 75)
<i>Desired Organizational Form/Structure</i>	Mechanistic (bureaucratic with high formalization).	Organic (flexible and participative encouraging cooperative social action).	(Nerur, Mahapatra, & Mangalaraj, 2005, p. 75)
<i>Completion of project (termination)</i>	Everything what is described in detail up-front must be fulfilled.	Sometimes deliverables, which during the project appear to be less important, are not delivered (in consultation with the client).	(Owen R. , Koskela, Henrich, & Godinhoto, 2006) (Arbogast, Larman, & Vodde, 2012)
<i>Control</i>	Defined plans, i.e. the requirements and milestones.	Feedback – which requires: (1) clear goal, (2) visibility, (3) inspection, (4) adaption.	(Atkinson S. , 2011)
<i>Success</i>	Conformance with defined plans. E.g. does the design satisfy the specifications which were specified up-front?	Realisations of quantified desired business outcomes that fulfil the business needs of that moment.	(Atkinson S. , 2011) (Arbogast, Larman, & Vodde, 2012)

The main differences between agile- and conventional project management are discussed further below.

Respond to and embrace change vs. resisting change

The agile management philosophy is built on **responding appropriately to change**. Change should be embraced, instead of repelled. As Sanchez and Nagi write: “*Agility is an overall strategy focussed on thriving in an unpredictable environment*” (2001, p. 3562). Change is seen as a chance to improve the value of the project for the client (Owen R. , Koskela, Henrich, & Godinhoto, 2006). Therefore Hock (2000, pp. 20-26) describes this as the art of ‘*chaordic leadership*’: “*agile project management can be seen as harmoniously blending characteristics of both chaos and order*”.

Conventional project management is focussed on delivering the agreed specifications. A **planning** and scope is determined at the beginning of a project and changes are therefore undesirable (Koppenjan, Veenemeean, van der Voort, ten Heuvelhof, & Leijten, 2011). However, as research has shown, it is very hard to predict the requirements for future business needs in a dynamic and changing environment (Sutherland & Schwaber, 2007).

Developing solution vs. detailed specification upfront

In order to respond to change it is necessary that there is **no detailed specification upfront** (DSDM Consortium, 2015). With agile project management, the scope is developed and implemented step by step and in short iterations. Agile emphasizes defining value up-front as something to strive for. However, a present-day increase in complexity and uncertainty causes that defining value up-front is less appropriate (Williams, 2005).

The client, together with the participants of the development team, defines the solution during the project. This is called *respond at the last responsible moment*, thus not make decisions if it is not needed yet. Therefore the scope should stay flexible. This is done by turning the *iron triangle of project management*¹⁵ 180 degrees, as is shown in figure 2.5 below.

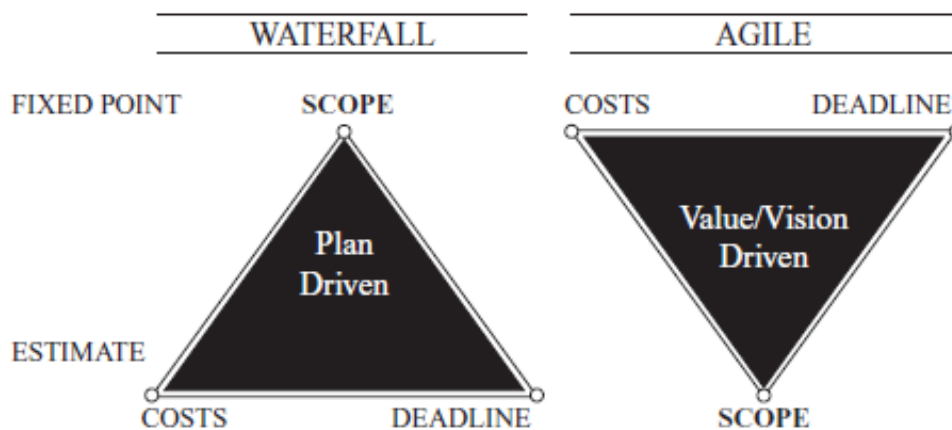


Figure 2.5. Flexible scope makes it possible to respond to change (Opelt, 2011, p 48).

Jim Highsmith (2009) takes this even one step further. He creates a *new iron triangle* where the old iron triangle is seen as constraints, as illustrated in figure 2.6 on the next page. Highsmith states that these are the ‘*enablers*’ to enable the *value* and *quality* of a product.

¹⁵ The *iron triangle* is also known as the *project management triangle*. This is a model of the constraints of project management, as can be seen in figure 2.5.

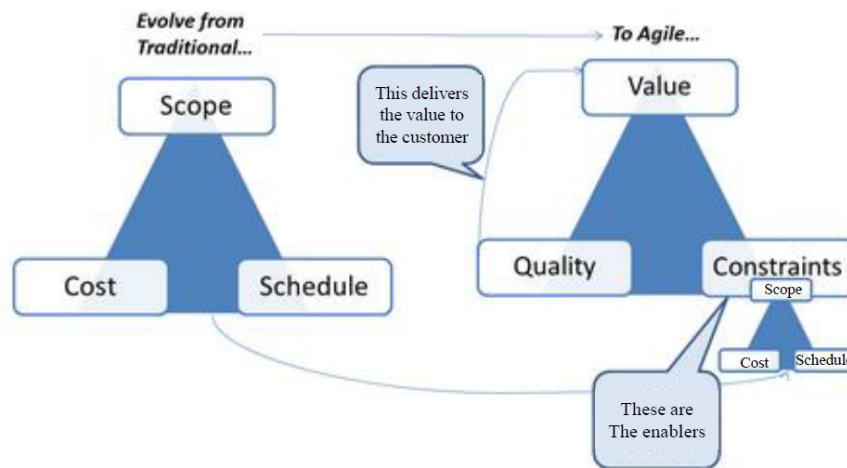


Figure 2.6. Iron vs. Agile triangle (Highsmith J. , Agile Project Management , 2009).

Conventional project management follows a rigid sequence of processes and suits best when the scope is already completely clear. However Nonaka and Takeuchi (1986) proved that it is less suited for products when there is no clear view of the end-result. Even Winston Royce, creator of the waterfall model, believed that this process is not best suited for innovative projects. He stated this model has to be carried out at least twice, in the case of an unclear view on the end-result. (Royce, 1970; Opelt, Gloger, Pfarl, & Mittermayr, 2013).

Early value and short term delivery vs. rigidly following the original plan

Most agile methods emphasize **iterative development**. This can also be done with conventional project management but agile distinguishes itself from conventional methods by a very short time span (weeks instead of months). Furthermore, agile is focused on short term value delivery. (Owen R. , Koskela, Henrich, & Godinhoto, 2006). An evaluation is performed after each value delivery, causing the feedback cycles to be accelerated, and making the process more dynamic.

Conventional project management is not focussed on delivering results during the project. It takes relatively long before any deliverables are produced. Most effort is focussed on delivering 'the only one' end-product. Figure 2.7 shows the iterative character of delivering value of agile versus the waterfall approach.

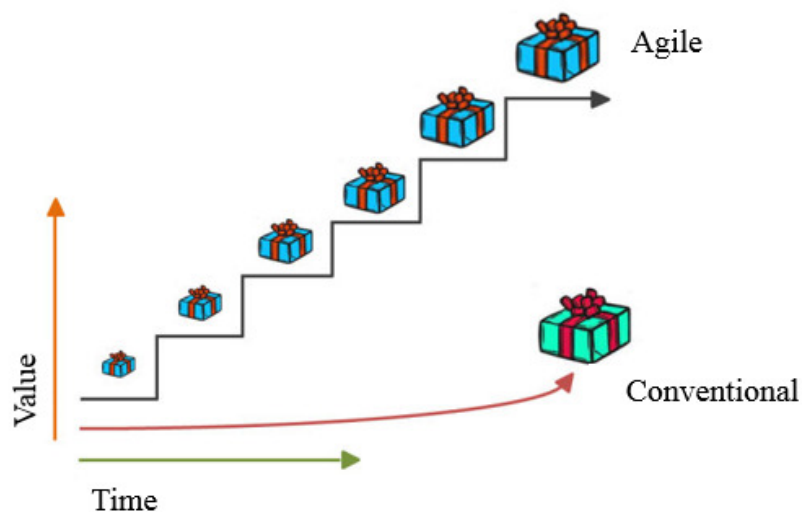


Figure 2.7. The value delivery of agile project management vs. conventional project management (based on: (Boek, 2016).

Self-managing vs. unidirectional flow of communication

In agile project management, the project manager has a more facilitating role to enable a **self-managing team** (DSDM Consortium, 2015). To make this possible it is necessary that teams are small, empowered, co-located and multi-skilled. This allows the team members to be innovative due to intensive communication and collaboration between disciplines in one team. Hence, with an agile approach the organisation will be flat (Boehm & Turner, 2009).

Conventional project management is organised as a unidirectional flow of communication and information (Highsmith J. , Agile Project Management , 2009). The organisation is more hierarchical than with an agile approach. Conventional project management has tight guidelines and expectations for every team member. The advantage of these tight guidelines is that the project is less dependent on the unique skill of every team member because there is a clear framework set out for them. (Owen R. , Koskela, Henrich, & Godinhoto, 2006).

Team with the client vs. “us and them”

Collaboration and communication are important aspects of agile. The client and consultant work closely together to a shared goal. To support collaboration, it is important to have a *no blame* and *transparent culture* (DSDM Consortium, 2015). Intensively involving clients in the development team must prevent wrong expectations and support mutual understanding about the product and process. For this reason, the client is not merely updated on the development of the project, but really becomes part of the team.

2.1.4 Summary of the main differences between agile- and conventional project management.

Project management has come a long way since its introduction in the late 1950s. Significant differences between *agile-* and *conventional project* management was found in literature. Agile is a newer management approach (since the 1990's) and limited applied in the construction industry so far. Consequently, there is not much literature available about agile in the construction industry. Nonetheless, the available studies foresee a good potential for agile project management in construction, and argue that agile could improve efficiency in a project.

In literature, a clear contrast was found between agile- and conventional project management methodologies. Five main differences were found (written down as agile vs. conventional):

(1) Respond to and embrace change vs. resisting change

Agile project management responds to change instead of resisting to change. Change is seen as insuperable due to a present day increase of complexity and uncertainty. Moreover, responding to change can add project-value for the client during the project.

(2) Developing solution vs. detailed specification up-front

In order to response to change a solution is evolutionary developed instead that requirements are set up-front.

(3) Early value and short term delivery vs. rigidly following the original plan

To be able to develop evolutionary agile methods emphasize *iterative development*. Agile is different from conventional project management due to is very short time span (weeks instead of months).

(4) Self-managing vs. unidirectional flow of communication

Agile uses different organisation schemes in order to reach dense collaboration and communication within teams. Development teams work simultaneously, co-located and are self-organising. Consequently, the organisation is more flat than hierarchical. An agile project manager must have a more facilitating style.

(5) Team with client vs. "us and them"

Differences in roles and responsibilities: the client is not only informed about the progress but really part of the development team.

In the next paragraph, this thesis is aimed at investigating which contractual concerns arise due to these differences.

2.2 Contracts in perspective to agile

From the previous paragraph (§2.1) it appeared that agile project management is fundamentally different from conventional project management. *But which contractual concerns arise due to these differences?* To answer this second sub-research question, firstly contracts will be discussed in general (§2.2.1). In the next paragraph, this research will dive into the contractual agreements typical for the construction industry (§2.2.2). Henceforth the concerns of contracting in perspective to agile project management will be examined (§2.2.3). Finally, in the last sub-paragraph, a summary of the findings will be given (§2.2.4). The highlighted blue rectangular in the figure below illustrates the content of this paragraph.

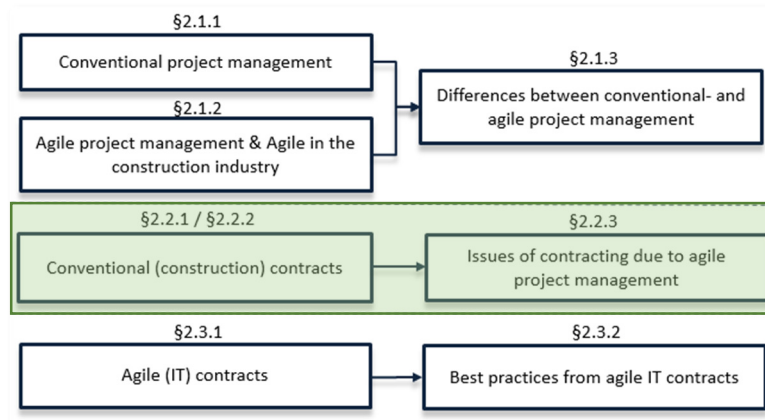


Figure 2.8. The content of paragraph 2.2 (own illustration).

2.2.1 Contracts in general

At the time this thesis was written, the Nobel Prize in economics (2016) went to Oliver Hart of Harvard University and Bengt Holmström of Massachusetts Institute of Technology – for their work on contract theory for all kinds of contracts. *“Contracts are just an incredibly powerful way of thinking about parts of economics,”* said Hart. *“They are fundamental to the whole idea that trade is quid pro quo and that there are two sides to any transaction”* (2016, p. 1). Hart and Holmström explain that contracts help us to be cooperative and trusting when we otherwise may be disobliging and distrusting. As already described, one of the four agile values is: *“customer collaboration over contracts negotiation”*. But if we look at the statement of Hart, contracts can help to create this collaboration.

Before delving into contracting, a clear view on contracts in general is necessary. The Dutch Civil Code, Article 6:213 defines a contract as: *“an agreement in the meaning of this title is a multilateral juridical act whereby one or more parties enter into an obligation towards one or more other parties.”* This is not the only way this term is used; a contract can mean different things to people with different backgrounds. Legally, a contract is a reciprocal commitment between two or more parties that is legally binding and enforceable; the contract defines the rights and obligations of each party. In economic terms, a contract is a coordination agreement that sets out how parties work together.

This thesis is written from the viewpoint of project management – and will therefore focus more on the latter economic viewpoint of how parties should work together. Chou and Chou (2009) and Lee (2003) describe that the contract is the demand for services or products that have to be delivered within a timeframe between the contracting parties, and a well-managed contract stimulates both parties to successfully complete the contract. Axelos (2015, p. 157) confirms this and gives a specific project management definition of a contract: *“A contract is a legally binding, enforceable and reciprocal commitment governing the collaboration between two (or more) parties”*.

When we look to the practicalities of contracting, we have to consider the principles of contract law. There are three main principles of contract law (Chao-Duivis, Koning, & Ubink, 2013, pp. 2,3):

- *Freedom of contract* – parties have freedom to stipulate anything they want in a contract, as long as it has compliance with established practice and law and is feasible.
- *Binding force of agreements* – contracts are binding for the contracting parties and these parties are obliged to execute the contract. This is, however, restricted by the standards of reasonableness and fairness (DCC, Article 6:248 (2)).
- *No prescribed form* – contracts are not subjected to any format. Most contracts are written documents, as this is the easiest format to prove what has been agreed upon. Nevertheless, in some cases the law dictates a specific form for important agreements to protect the weaker parties.

Furthermore, there are three essential elements for the formation of a contract. First, parties must have a legal capacity to act and must have an intent to create a legal relationship. Second, the agreement should comply with the established practice and law (only '*dwingende recht*'¹⁶). Third – in order for an agreement to become into being – there has to be *offer and acceptance* by both parties (DCC, Article 6.217). This means that often two phases can be distinguished, namely: a *pre-contractual* and a *post-contractual* phase (Lee M. , 2003, p. 144).

A common misconception is that only with a signature a contract comes into being. Even in the pre-contractual stage, a party cannot always withdraw from that stage without any consequences. There comes a moment where a party must reimburse the other party's expenses. Or even, if the party has led the other party to believe the agreement will be entered, he cannot withdraw anymore and he might be obliged to pay the '*positief contractsbelang*'¹⁷ (Chao-Duivis, Koning, & Ubink, 2013, p. 9).

Important elements of a contractual agreement

As described above, a contract becomes into being through *offer and acceptance*. But what does a contract contain? Often the client provides the scope and then the supplier makes an offer, which in most cases contains a price and a planning. Combined, this forms the agreement which can be governed by general terms and conditions. To better understand the nature of contracts, the following text will go into more detail about the most important elements of a contractual agreement: *relationship between parties; general terms and conditions; scope of work and the financial provisions*.

Relationship between parties

Before signing a contract, it is important to look at the relationships between the involved parties. If there is already a poor relationship between parties, the contract will not change this (Doloi, 2012, p. 235). Relationships and contracts have been a subject of recent debates. It appeared that trust is imperative in order to be able to agree. It can be challenging for clients and suppliers to find trust without prior collaboration (Zijdemans & Stettina, 2014, p. 78).

The importance of relationships is underpinned by Kees Berends¹⁸, who stated: "*A contract is a formalization of a relationship between parties, rather than a list of obligations and payment conditions...*"[...] "*...the contract is a mechanism or management tool for this relationship*" (Berends, 2016).

¹⁶ *Dwingend recht* (Dutch) means that the law contains mandatory rules which cannot be waived.

¹⁷ *Positief contractsbelang* (Dutch) is a manner in which damage to unauthorized broken off negotiations is calculated.

¹⁸ *Kees Berends* is a guest lecturer at the Erasmus University, Rotterdam and the Technical University in Delft. Berends published various papers about contracting in large capital projects in the oil and gas industry.

General Terms and Conditions

The law only partly describes the relationship between parties and contains mainly of regulatory (non-mandatory) provisions. General terms and conditions can be used to waive these provisions. These general terms and conditions are used for arrangements that re-appear in most agreements. The construction industry in its turn often uses *The New Rules 2011*, this will be discussed in the next sub-paragraph (§2.2.2).

Scope of work

The contract defines the scope and the work that should be done. Traditionally the client provides the scope of work to the supplier. Often, a detailed list of requirements is made. This can also be done in the form of a *functional program of requirements* (FPOR) with *additionally a technical program of requirement* (TPOR).

Payment and award methods

An important aspect of a contract is the payment and award method. To a large extent, this will determine the allocation of risk. The pricing model can be a result of the negotiating power or the incentive to collaborate. Tengeler (2014, p. 276) argues that the best contracts are agreements where there is a balanced risk-sharing because this causes a partner-relation between all parties with a collective sense of responsibility. Many different payment systems exist; fixed price and reimbursable methods are the two most opposite systems. In figure 2.9 the different kind of price and payment provisions in relation to risk sharing are shown.

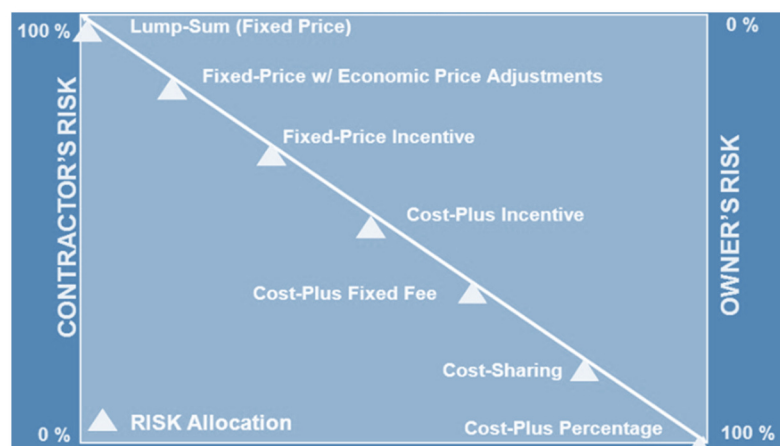


Figure 2.9. Contractual risk allocation in relationship to payment and award methods (Lee S. , 2015, p. 35).

In the following text, the opposite extremes of payment and award methods will be explained, namely fixed price versus reimbursable. Each method has its own advantages and disadvantages.

- Fixed price / Lump sum

A fixed price is often combined with a fixed scope and fixed delivery date. One of the preconditions of this type is to define all requirements up-front. Only then, a realistic price and planning estimation is possible (Tengeler, 2014, p. 277). Clients often have the responsibility of defining the scope and requirements. Suppliers have the responsibility to deliver these requirements within the budget, and possibly a timeframe. Suppliers can do this in a flexible way; they have to meet the cost and time constraints – but within these conditions they are free. On the other hand, after the contract comes into being, this is a very inflexible system for the client. Suppliers will charge the client for every additional scope change.

The financial risk lays most on the supplier's side. This can give the supplier the incentive to deliver the project as low-cost as possible which can possibly affect the quality. Clients can have the driver to try to add as much functionality within the original scope as possible (without willing to pay extra).

- Percentage of investment

This method is quite similar to the previous one. The award system for the supplier is a percentage of the total investment of the client. Often, a maximum fee is agreed upon. Similar responsibilities and drivers for both parties are relevant for this method.

- Cost reimbursable contracts – cost plus fee, unit rate or bill of quantities

In this method the supplier is paid for all agreed expenses plus an additional fee to allow a profit margin. A cost reimbursable payment method is often used where the long term quality is a much higher concern than the cost (Kalnins & Mayer, 2004, p. 3). Moreover, this method is often used in projects where there is no clear scope at the beginning. With the initial information suppliers will try to give an estimation of the total costs. Still, there is a limited certainty of what the final costs will be (Opelt, Gloger, Pfarl, & Mittermayr, 2013, p. 25). Since all the costs are reimbursable the financial risk will be for the client. In terms of costs there is less incentive for the supplier to work as cost efficient as possible.

- Other payment methods

It goes without saying that there are many variations on these payment methods, for example: *cost plus percentage fee*, *cost plus fixed fee*, *capped cost*, *target cost*, *finer*, *pain/gain*, and *cost plus incentive fee*. Also, some parties prefer payment per project phase.

Yet another method is the *alliancing model*. In this model the client and supplier will enter an alliance in which they can make agreements about risk and profit sharing. One of the most significant differences is that all project risk management and outcomes are collectively shared by parties. So instead of risk allocation there is risk sharing (Austrian Government, Department of Infrastructure, 2015). Both parties determine a target outcome and share the gain/pain resulting from the actual cost. In this way, the client is more involved in the design and the two parties need to work on a basis of equality (Turner & Simister, 2001, p. 460).

2.2.2 Contracting in the construction industry

In the previous sub-paragraph, contracts in general are discussed. In the following paragraph, this study will have a closer look at contracts specific for construction industry. In the construction industry, the typical *general terms and conditions for consultant, architect, engineer* towards the *client* are captured in The New Rules 2011¹⁹ (DNR 2011). This is illustrated in figure 2.10 below. The DNR 2011 can also be used when the client has an integrated contract with the contractor (e.g. UAV-IC 2005²⁰). In that case – when the contractor is responsible for all the design and execution work – the DNR 2011 can be used as a legal relationship between contractor and consultant/architect/engineer. Since the scope of this research is the legal relationship that the DNR 2011 describes, this research will use the DNR 2011 as a starting point for an agile construction contract.

The DNR 2011 can be seen as a ‘standard forms of contract’. Parties can include or exclude the different clauses, which can also be of interest for this research. The DNR 2011 contains thirteen chapters: *the commission, adjustments to the commission, obligation of both parties, liability, delay, termination and the consequences, ownership and IP rights and financial provisions*. A similar content will be used in this research to discuss contractual agreements.

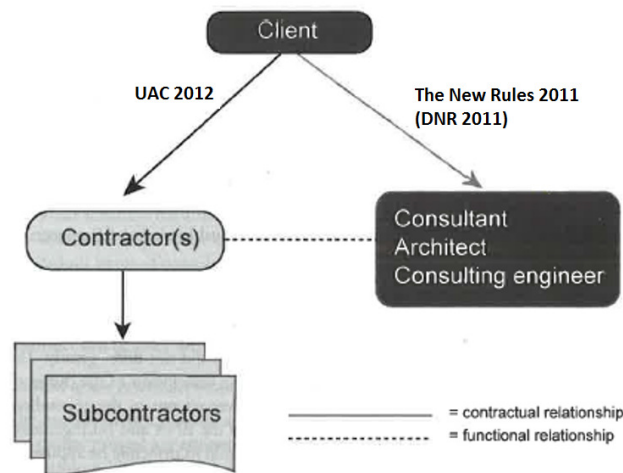


Figure 2.10. Tradition relations between client, consultant and contractor (Chao-Duivis, Koning, & Ubink, 2013, p. 29).

Traditionally and in most cases, these contractual aspects were defined as specific and detailed as possible to avoid conflicts. These kinds of construction contracts historically have been based on the principles of waterfall projects (e.g.: PRINCE2, PMBOK). This study will use the term ‘*conventional contracts*’ for contracts that are tailored on conventional project management methods.

These conventional contracts resulted in a chronologically scoped design and execution, with detailed requirements up-front, governed by extensive change control. Usually the scope, time and/or price are fixed. Thorup and Jensen (2009, p. 195) describe that this fixed scope, price and time is resulting in low trust, blaming mentality and other suboptimal behavior leading to poor end-results. This is because parties do not treat each other as equals from the start – which is the result of the fixed contractual structure (Thorup & Jensen, 2009, p. 195).

To conclude: conventional contracts – which describe the chapters of the DNR 2011 in too much detail – do not leave room for a real agile project management approach. Therefore, in the next sub-paragraph the concerns that arise per contractual aspect (based on the DNR 2011) are outlined.

¹⁹ DNR 2011 is the Dutch abbreviation of The New Rules 2011 (Dutch: De Nieuwe Regels 2011). The abbreviation DNR 2011 will be used in this thesis.

²⁰ UAV-IC: Uniform Administrative Conditions for Integrated Contracts 2005

2.2.3 Contractual concerns due to agile project management

In this sub-paragraph, it is investigated how the management approach of agile (see §2.1) causes issues with contractual agreements of the DNR 2011. The agile project management method is laid next to the clauses of the DNR 2011. Not only the findings out of the previous paragraph (§2.1) are used, but literature about agile contracting as well.

Per clause of the DNR 2011 it is considered if this clause could hamper agility. First a rough selection is made. Second these selected articles and clauses are examined further: what do they mean and why do these aspects need attention when using agile project management? Several concerns came to light. However, this does not directly mean that all these clauses have to be adjusted; these articles require attention when using agile project management.

Appendix A.1 contains a list of all relevant articles in perspective to agile project management.

Appendix A.2 includes an explanation why these articles are chosen in perspective to agile project management.

In the next sub-paragraph a summary is given of all concerns that came forward during this literature study and the 'agile analysis' of the DNR 2011.

2.2.4 Summary of contractual concerns following agile project management

Existing literature emphasizes that not only the contract itself is important, but the pre-conditions as well. Therefore, both the pre-conditions as the contractual aspects of an agile contract are discussed in the text below.

Pre-conditions of a contract

1. Relationships between the contracting parties

An agile contract should be a result of trust and collaboration. This does not directly differ from conventional contracting. However with agile project management, clients are more critically involved in agile projects. And thus there must be a good understanding between parties to work agile in a proper manner (The Royal Swedish Academy of Sciences, 2016). However, contractual relationships typically entail conflicts of interest and some parties see a contract as a coercive measure to get what they want. Contracts are used too often to push off obligations and risks (Tengeler, 2014, p. 238).

Arbogast et al. (2012, p. 5) describe that lawyers should change their attitude in agile projects as well: *“Lawyers view their role as being there to protect clients from things they may not even know about. A lawyer is ostensibly trained to be distrustful”*. With this mind-set, parties already treat each other in a hostile way from the start of a project. It must be said – again – that this is not only a problem with agile contracting, but contracting in general. Needless to say, this attitude hurts the following agile value: *“Customer collaboration over contract negotiation”*.

2. Attitude toward agile project management

Since agile methods are fundamentally different from conventional methods, parties must check if they both understand this new approach. Commitment to agile is one of the main success criteria in agile projects (Chow & Cao, 2008, p. 965). If there is a lack of commitment towards these new agile methodologies, the chances of success are too low to continue the project in an agile manner. This aspect did not directly come forward as an issue due to conventional contracting, but is described in literature as an important pre-condition of an agile project. Thus, this must be considered before signing a contract for an agile project and is of interest for this research.

Contractual aspects

1. Commission and scope description

One of the problems, as both Hart and Holmström²¹ have shown, is that contracts cannot specify exactly what each party must do in every future circumstance (Ellingsen, Persson, & Persson, 2016). Similarly, the overall philosophy of agile is that you cannot specify a project completely upfront. Change is largely inherently to this agile approach; there is no clear up-front detailed scope description. The scope keeps evolving because of the *reprioritizable backlog* and *adaptive iterative planning* (Arbogast, Larman, & Vodde, 2012, p. 21). Decisions must be made as late as possible to keep projects flexible for change: *“Respond at the last responsible moment”*²². As a result, the scope of the project may not be the same in the beginning as in the end.

2. Defining the payment and award method

A *fixed price* is hard to define in an agile project, due to an evolving scope. However, clients habitually request a fixed price contract to ensure security for themselves. Yet, practice has shown this sense of security is false. Either the quality is below expectation or a lot of extra work must be

²¹ Reminder: Hart and Holmström received the Nobel Prize in Economics in 2016 on contract theory.

²² Reminder: “Respond at the last responsible moment” means that decisions are taken at the instant in which the cost of the delay of a decision surpasses the benefit of delay; or the moment when failing to take a decision eliminates an important alternative.

done (Tengeler, 2014, p. 240). Another problem of fixed price contracts are expensive change requests. There are possibilities of scope changes, but that comes with a price. Opelt et al. (2013, p. 10) give the following example to illustrate the concerns with fixed price contracts: *“On the Agile Tour 2011 in Vienna, Mitch Lacey²³ an agile practitioner and consultant, told the following story about a conversation between customers and suppliers. A client came to him and explained his project in half an hour. He then proceeded to ask what such a project would cost”*. Mitch replied:

“This is a question I cannot answer because you should expect a professional response from me. I do not have enough information after 30 minutes to be able to make a meaningful statement. That would be totally unprofessional. I will make another suggestion: You work for two weeks with us and if you like what you get, then you pay for two weeks. If not, then you don’t pay. And so we continue. You pay when you are satisfied with the work we deliver. You could of course abuse this principle, since we obviously cannot exclude the functionality, which you are not satisfied with and for which you have not paid, from the product. New functionality is developed on top of the supplied functionality of the last iteration. In this case you would pay for the development in the first two weeks, then you would not pay for the next two weeks, and then you would pay again and so on. This would cut your costs and at the end you would have the finished product with all the functionality at half the cost. However, we would note in this case that you had not dealt with us fairly and we would have to stop working.”

This way of dealing with a client that is not known yet, minimizes the risk. It is also a successful practice to be able to start from a basis of trust and respond if the trust is broken (this is called the *tit for tat strategy*) (Opelt, Gloger, Pfarl, & Mittermayr, 2013, p. 10).

The opposite of fixed price contracts are *reimbursable contracts*. As already discussed, these contracts are solely dependent on price per job level, not on performance. Hence, there are no consequences for the supplier if the project gets financially out of control. This causes the financial risk to stay with the client.

Furthermore, with an agile approach, all parties are involved in the process of designing the best solution. In other words: try to find the most value for the business. This can mean that suppliers come with ideas which reduce their own development time. With a fixed price, this is in the supplier’s advantage, but with a reimbursable contract he is cutting his own income with his own ideas. For example, if the supplier finds a solution that delivers enough value for the client in 20% less time due to a smart idea, he will also get 20% less of the payment. Something must be found to keep stimulating the mind-set of creativity designing smart solutions, without being a disadvantage for one or both parties in terms of the awards.

3. Obligations of the parties in terms of communication and organizational structure

Stephanie van Gulijk (2010, p. 4) pointed out that bad communication is one of the main causes of failed projects. She argues that the contract only obliges parties to exchange information. However by doing so, parties are not really communicating interactively. Communication should go further than the pure transmittal of information. Parties must *‘actively communicate’*. So communication must not be based on only describing what you want as a client and leaving it to the supplier. With the agile methodology the client must be continuously and intimately involved with all the issues in the project. Since communication and organizational structures are very different with agile project management, it has to be investigated how these differences influence contractual agreements.

²³ Mitch Lacey is an agile practitioner and trainer and author of the book, "The Scrum Field Guide, Agile Advice for Your First Year and Beyond." Mitch Lacey has over 10 years of agile experience and served on the Board of Directors for the Agile Alliance.

4. Liability

One of the agile values is intensive collaboration. But because the solution is created during this intensive co-creation between client and supplier, the question arises: who is liable? The issue of liability becomes trickier in the case of an agile contract.

5. Ownership of the solution

Due to the intensive collaboration, the same issue as with liability may arise with the ownership of the design or solution. At this moment, in terms of the copyright act, the client has the economic ownerships while the supplier has the moral ownership. It should be investigated if this changes when working agile.

6. Project completion: 'Definition of Done' and termination of the contract

The *definition of done (DoD)* concerns the 'acceptance and completeness' of the solution. One of the key advantages of agile developments – from the client's point of view – is that the project is not tied to long delivery cycles. After each sprint the client wants workable products that add value to the overall project (these are called *increments*). But after a sprint is done, how will parties determine whether this has been achieved? Again, since there are no detailed specifications, this is a point of attention which should be addressed in an agile contract

The same issue arises considering the end of a whole project: when should each party be allowed to terminate the whole project? Agile methodologies advocate that it should be possible to terminate a project after each sprint. However, from the supplier's side, sudden termination can cause an organizational risk.

To conclude

It can be concluded that most contractual concerns – which are mentioned above – are caused due to the variable scope description and different roles and responsibilities (organisational scheme) of agile project management. These concerns raise questions on how to approach these aspects in an agile contract. The next paragraph contains the 'best practices' from agile IT contracts.

2.3 Agile IT contracts

In the previous paragraph (§2.2) numerous concerns were listed about agile project management in relation to contracting. Since agile is ‘born’ and used for over 20 years in the IT industry, the construction industry could learn from this industry. Consequently – to give an answer to the questions raised in the previous sub-paragraph – the following sub-paragraph will look at best practices from the IT industry. This also means that an answer is given to the third and last sub-research question of this thesis: *What are the best practices from agile IT contracts, which can be of interest for agile construction contracts?*

Firstly different kinds of agile IT contracts will be listed (§2.3.1). Next, best practices from these IT contracts will be discussed (§2.2.3). To sum up, the last sub-paragraph provides a summary of the findings (§2.2.3). The highlighted blue rectangular in the figure below illustrates the content of this paragraph.

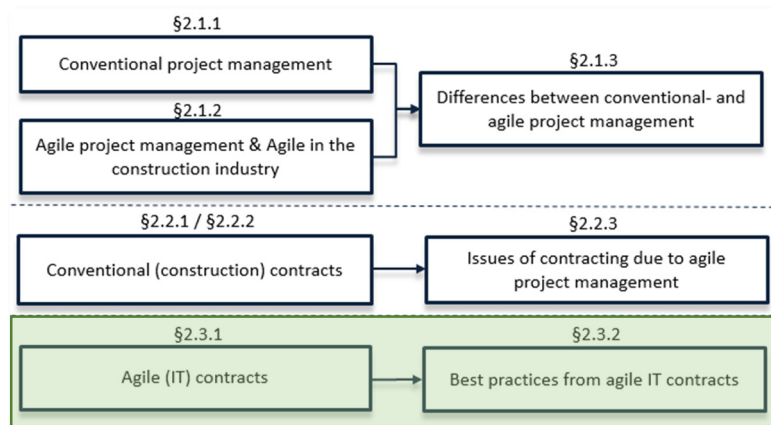


Figure 2.11. The content of paragraph 2.2 (own illustration).

2.3.1 Agile IT contracts

Until now fixed price contracts have frequently been used in the IT sector. Agile project management has paved the way for new and more dynamic contracts. Nicholas Mitchell²⁴ states that parties composing agile contracts need to be flexible enough to realise the benefits while accepting the reality that projects can fail, whether they are agile or conventionally planned. This is also the different viewpoint of agile practitioners versus lawyers: *“While advocates of agile are optimistic about its ability to deliver based on mutual trust, lawyers tend to look at contracts as mechanisms for apportioning risk.”*

Project managers and lawyers should realize they may not see many of the traditional contractual protective clauses, such as clear pre-defined scopes. These clauses must be replaced by other forms of mitigating measures. Agile is more about reaching the goal of client satisfaction instead of complying with predefined scope, time and cost. This is hard to define in contracts. A right and appropriate balance ought to be found in agile contracting.

Law firm Bird&Bird (2016, p. 06) wrote the paper *“Contracting for Agile Software Development Projects”* about the legal implications of agile IT contracting. This paper describes three key goals of a contract:

- Define the purpose of the project (i.g. what are the parties trying to do).
- Define how the project is to be established and run.
- Define what happens if the project goes wrong.

²⁴ Nicholas Mitchell, an associate at technology law firm White & Black.

Bird&Bird stated that contracts designed for conventional project management are focusing in most cases on the third bullet. Conventional project management makes the pre-assumption that failure can be avoided if the supplier complies with the waterfall approach and its processes. However, as discussed, agile project management accepts it is unrealistic to avoid change and thereby sometimes failure. Agile project management works iteratively and learns from failures that already occurred in the project. Appropriately, the contract should reflect this approach.

Agile contract therefore focus on the first and the second bullet. It is very important to align all the expectations of all parties that are involved in the project. Expectations that are not aligned can lead to disputes that are very difficult to resolve. This complies with the first bullet. The second bullet is described in detail in agile tools such as Scrum and AgilePM. These tools define how the project is established and managed. Bird&Bird (2016, p.7) underpins that agile contracts should seek to replicate this agile approach of real time visibility and control of the project.

Ten different agile IT contracts

Not only law firm Bird&Bird has discussed agile IT contracting. This section will provide a list of different viewpoints about agile contracting that have been developed in the recent years in the IT. Different authors can be found (Zijdemans & Stettina, 2014; Thorup & Jensen, 2009; Book, Gruhn, & Striemer, 2012; Sutherland J. , Agile Contracts: Money for Nothing and Your Change for Free, 2008; DSDM Consortium, 2015; Opelt, Gloger, Pfarl, & Mittermayr, 2013; Arbogast, Larman, & Vodde, 2012; SAFe, 2016). Each author has its own viewpoint and idea about agile contracting. Below a selection of ten contracts and ideas is listed.

- 1) Arbogast, Larman and Vodde (2012) describe the '**Agile Contract Primer - multi-phase variable-model**'. Tom Arbogast is a lawyer with experience in IT projects and contracts Craig Larman and Bas Vodde are both organizational-design consultants and coaches in agile development. The *Agile Contract Primer* pleas for a better understanding of agile project management by lawyers. The *multi-phase variable-model* considers that during a project risks and uncertainty changes. Henceforward, for each other phase with a different risk and uncertainty another contractual framework can be used.
- 2) Opelt, Gloger, Pfarl and Mittermayr (2013) argue that for small agile projects reimbursable contracts can be suitable. However, due to the lack of applicability for large complex projects, a new kind of fixed price contract is needed. They describe in their book '**Agile Fixed-Price Contracts**' an agile contract for the IT industry tailored to Scrum. This is a contractual framework with a fixed price and time, however the scope is left variable. This does not imply that clients do not know what they will get. Opelt et al (2013, p.49) explains the following: "*the agile contract is characterized by the fact that the initial work toward detailed specifications is distributed over the project phases. Thus, the requirements are refined just in time.*" This approach must:
 - reduce the knowledge decay;
 - simplify adaptation to changes of scope;
 - allow a quick project start;
 - offer the advantage that the new parts of the detailed requirements have already been created, based on cooperation and knowledge of previous deliveries within the framework of the project accumulated experience. This allows communication between the parties to improve iteratively;
 - changes in the project scope are possible and are provided at no extra cost;
 - ensure a common approach to cost estimation and deliberate governance is agreed to contractually;
 - ensure it is a cooperative agreement that keeps motivation high for all sides involved.

- 3) Thorup and Jensen explain (2009) their concept of **'Collaborative Agile Contracts'**. In this contract the payment date is after a certain criterion or milestone is accomplished. This criterion is not a specific date but rather the completion of a product feature after a sprint.
- 4) Book, Gruhn and Striemer (2012) have designed the **'Advantage Pricing Model'**. This model can be seen as a combination between fixed price and reimbursable contracts. The software suppliers are paid for their effort after each individual sprint. For the whole project an estimation is made and after each sprint the effort is compared and evaluated with the estimation and compensated. The model, like the previous one, is mainly focused on an 'agile' payment system.
- 5) Jeff Sutherland, one of the inventors of the Scrum methodology, has introduced a new variant on the fixed price and fixed scope contract. Sutherland (2008) introduces two principles for contracts: **'Money for Nothing'** and **'Change for Free'**. These principles provide room for the client to stop the project after any *sprint*, after paying 20% of remaining contract value. The supplier commits to deliver 80% of the *product backlog*. Sutherland proposes to fix the price and the project size (but not requirements or exact scope), however the client can change the scope by substitute products or features. For the contract to be successful Sutherland gives three conditions (Sutherland J. , 2008):
 - The project must be managed by the Scrum method.
 - At the end of each sprint the product owner will reprioritize the product backlog.
 - The total size of the project (the story points) will stay the same.
- 6) The DSDM consortium designed a contract for their AgilePM tool: the **'DSDM Contract'**. The Agile Project Management Handbook v2 (2010, p.190) describes: *"if commercial arrangements dictate that a 'fixed price for a fixed specification' model should be applied to the project rather than a more collaborative approach, it is important to recognise that, at the working level, this will not be an agile project. Under such circumstances, all that can be done is to segment the project into small deliverable chunks and to ensure the supplier is focused on, and is paid to deliver, only what is specified in each chunk. The specification of detail for any given chunk should be left to the last responsible moment and should be informed by what has already been delivered together with very latest thinking on what is needed. The later chunks in the project should reflect the least valuable features of the product being built by the supplier. Arrangements with suppliers should allow for changes that may be needed to the product they have built to specification in an early chunk to be traded off against later work. This will, at least, force a change tolerant incremental approach that will help mitigate the risk of losing control of timescales and/or costs."*
 This DSDM contract can be considered as a 'draft contract' for the use of AgilePM projects. The contract describes in detail what each phase must deliver in terms of governance products and often even refers to the Agile Project Management Handbook.
- 7) The **'PS2000 Agile IT Contract'** is developed in Norway. The contract is based on the traditional Norwegian PS2000 IT contract. The agile tool Scrum is interwoven in the contract. It uses target-cost pricing with upper and lower limits so the cost and benefits are shared between both parties. Changes can easily be made. Small changes do not need any additional process and big changes must be agreed upon in the steering group of the project. The contract does not specify 'small' or 'big'. Termination can be done after an iteration, however the client has to pay four to six percent of the total value of the project to the supplier.

- 8) Zijdemans and Stettina (2014, p. 87) suggest the **‘Two Phase Contract’**. The focus of this contract is mainly on describing the scope in an agile manner. It assumes that the uncertainty gradually decreases in a project. Therefore this contract suggest that the beginning must be executed with an ‘open scope’. After the initiation and feasibility phase the scope should become fixed.
- 9) Kalnins and Mayer (2004) propose the **‘Hybrid Contract’**. Kalnins and Mayer focus only on the payment system. Basically this contract can be seen as a time and material (reimbursable) contract with a cap on the total cost.
- 10) Also the agile tool *Scaled Agile Framework (SAFe)*²⁵ describes an agile IT contract. The **‘SAFe Contract’** defines two contractual phases: (1) the pre commitment and (2) commitment period. In both these phases the client and supplier have different responsibilities. The pre commitment phase is illustrated in figure 2.12 below.

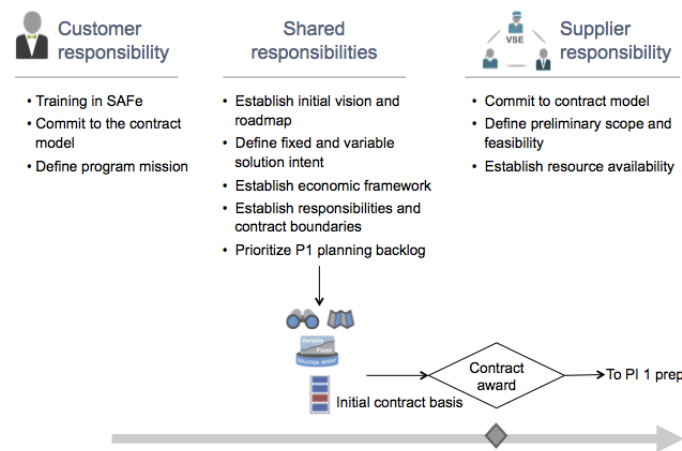


Figure 2.12. The pre commitment phase of a SAFe contract (SAFe, 2016).

After this phase the commitment phase starts. This is more comparable to traditional contracts. However, it is tailored to agile. After each sprint a *solution demo* is held and evaluated. Agreed-to metrics are compiled and analysed. The client may decide to continue the project, wind it down, or increase the funding. After each sprint, the vision, roadmap, solution intent and backlog are updated before starting the next one.

2.3.2 ‘Best practices’ of agile IT contracts

During the literature study about agile IT contracts it appeared that – despite the popularity of agile in the IT industry – a common view on agile contracts does not exist yet. For this reason, the best practices are collected out of the ten contracts that are described in the previous sub-paragraph. These best practices can be found in the appendix and are organized per contractual aspect (e.g. scope, financial provisions, etc.). A summary is given in the next sub-paragraph (§2.3.3).

In APPENDIX B.1 a more detailed description of agile IT contracts per contractual aspect is given.

In a later stage, the best practices from these contracts can be used and tailored to develop an agile contract for the front-end development of the construction industry.

²⁵ SAFe is an agile development tool, just as Scrum and AgilePM. SAFe is designed by Scaled Agile, Inc.

2.3.3 Summary of the best practices of agile IT contracts

In this section, a summary of all ‘best practices’ from agile IT contracts (discussed in appendix B.1) will be given. The following should be mentioned: it does not consequentially mean that since these ideas are suited to *agile projects*, they are not applicable to *conventional projects*.

Pre-conditions of a contract

1. Relationship between the contracting parties

Arbogast et al. state in their *Agile Contracts Primer*: “Successful projects are not ultimately born from contracts, but from relationships based on collaboration, transparency, and trust” (2012, p. 4). This is supported by Suprpto (2016, p. vi): “[...] collaboration cannot only be prescribed through formal arrangements/contracts but should also be socially constructed.”

As a results, the relationship between parties must be investigated before an agile project starts. Some IT contracts suggest that both parties should draw up a “*code of collaboration*” (Opelt et al. 2013). In most cases, it is recommended to study the track records and specific experience of parties (DSDM Consortium, 2015).

2. Check if the project is fit for agile

Agile IT contracts recommend to check parties’ commitment to an agile approach and parties’ knowledge about agile tools. Without this commitment and knowledge, it is considered as a waste of time and money to start a project in an agile manner. Agile project management is best applicable to complicated and complex projects (figure 2.13). This complexity is measured by ‘*what do we want*’ (requirements) and ‘*how do we do it*’ (technology).

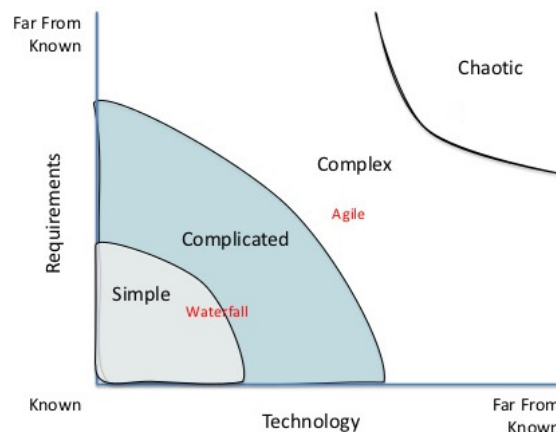


Figure 2.13. Applicability of agile project management on project complexity (based on the Stacey Matrix, 2013)

The commitment and knowledge of parties can be tested by *questionnaires* and/or *workshops* before the start of a project (Opelt et al. 2013; DSDM, 2010). DSDM developed a Project Approach Questionnaire (PAQ) to test ‘agile commitment’ of teams (DSDM Consortium, 2015, p. 205).

Contract aspects

1. Commission and scope description

Opelt (2013) describe that for any contract – in the context of agile – it is important that the scope is not totally defined upfront. This is done in most agile IT contracts by flexible requirements driven by a vision and product backlog (sometimes a roadmap) (SAFe, 2016; Opelt, Gloger, Pfarl, & Mittermayr, 2013; DSDM Consortium, 2015; Arbogast, Larman, & Vodde, 2012; Den Norske Dataforening, 2016). An example of how this vision and backlog is captured is shown in appendix B.2.

Success is measured by the extent in which the end-product satisfies the wishes of the client *at that moment*. Therefore, requirements must evolve during the project. The end-product is broken down

into sprints. Outcomes of these sprints are tested and accepted by the client. By doing so, the end-product grows with each sprint. The highest risks and highest value requirements are tackled first. Low value requirements are treated as 'contingency'. An agile IT contract evolves the same way: *an evolutionary contract model*.

2. Financial provisions

Four kind of payment options were seen in agile IT contracts:

- (1) Time & material contracts (SAFe, 2016; Thorup and Jensen, 2009).
- (2) Shared pain/gain fixed price (SAFe, 2016; Arbogast, Larman, & Vodde, 2012).
- (3) Fixed price in combination with a variable scope (DSDM Consortium, 2015).
- (4) Payment per sprint (Zijdemans and Stettina, 2014, Lacey, 2011).

All four options share the similarity of coping with a variable scope. It depends on the kind of project (and client) which payment method is most appropriate. The DSDM Consortium (2015, p.9), warns that the expectations of clients should be managed upfront: "*Clients should realize that the scope stays variable.*"

3. Obligations of the parties, in terms of organizational structure, general obligations and decision-making

All agile IT contracts cover specific agile tools (e.g.: Scrum, AgilePM) in the contract. The *organizational structure, obligations of parties* and *decision-making* aspects are described depended on that specific tool. The agile tool should not only be captured in the contract but – as stated before as a precondition – both parties (and all team members) should discuss and agree that it is a suitable tool to use.

4. Liability

'*Fail faster*' is mentioned multiple times as a measure to reduce liability and handling disputes in an agile project. *Fail faster* implies that disputes are less likely to escalate because of the iterative way that the end-result is developed. Due to sprints, *increments* (requirements) are delivered and tested frequently. Therefore, disputes can be solved at an earlier stage to keep the project on track and prevent escalation (Arbogast, Larman, & Vodde, 2012; Bird&Bird, 2016; Computer Weekly, 2016). Arbogast, et al. (2012, p. 4) even state that in agile projects covering the risk is not as important as in conventional projects: "*Agile approaches enable rapid incremental deployable deliverables and collaborative decision-making between the parties, and so relieves pressure on liability, warranty, and similar issues*".

That said, agile IT contracts still govern liability. In most IT contracts liability is handled very project specific.

5. Ownership and use of rights

These agreements are, just as the previous aspect, very project specific and is agreed upon up-front.

6. Project completion: 'definition of done' and termination of the contract

In agile IT contracts termination is considered as a positive outcome. *Acceptance criteria* and *test criteria* are defined just before a sprint starts (*just in time*): "*Only the framework for acceptance must be contractually clear*" (Arbogast, Larman & Vodde, 2012, p. 22). By doing so, at the end of the sprint the supplier and the client can check if the result meets these criteria.

Arbogast et al. (2012) state that because acceptance takes place after each iteration, the termination of the whole project must be an easy exercise. In case of early termination, all agile IT contracts contain a premium of the remaining budget that one party has to pay the other.

However, some authors wonder: would a client (and supplier) who already allocated budget and personnel ever terminate a project early?

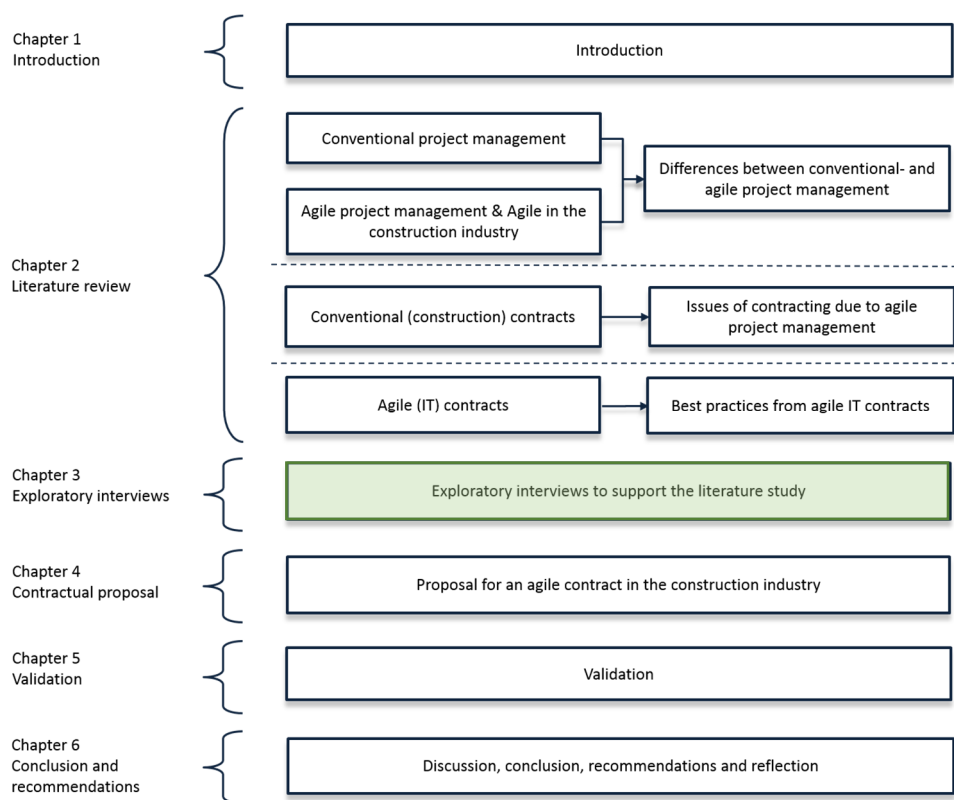
To conclude

Authors of agile IT contracts share the view that contracts can help to manage project expectations and set a baseline for collaboration during the project. Additionally, most authors argue that a proper relationship between parties is important before starting an agile project – and thus before setting up an agile contract.

In general, most agile IT contracts try to provide flexibility in defining the scope. Agile IT contracts attempt to find different ‘risk sharing’ payment methods to stimulate collaboration between parties. These payment methods also give room for a variable scope. Roles and responsibilities of certain agile tools are mostly imbedded in contracts.

Chapter 3

Exploratory interviews



“...the best way to predict the future is to design it...” Arup University

3 Exploratory interviews

In the previous chapter, conventional project management and contracts were examined in perspective to agile project management. Next, in this chapter, exploratory interviews are performed. The aim and purpose of these interviews are twofold:

- (1) Investigate the current state of agile project management within Arup.
- (2) Support the literature review with practical experience and understand issues and opportunities of current contractual relations of Arup with their clients.

First the *methodology* will be described (§3.1), followed by the *results* (§3.2) and a brief *conclusion* (§3.3).

3.1 Methodology

To save time, the first point (current use of agile within Arup) is primarily examined by multiple-choice questions: a structured questionnaire. The (implicit²⁶) use of agile is important to understand the current management situation of Arup. Moreover, information from this questionnaire can be used as context when analysing the results of the open interviews. Outliers in answers of the open interviews can possibly be explained by the answers that were given to this questionnaire.

The second point (issues and opportunities of agile contracting in practice) is examined with open interviews. This method is time consuming, but since agile contracting is the focus point of this research, it is important to investigate this thoroughly.

Selection of participants

Target respondents for the interviews are contract managers and project managers at Arup Amsterdam. These two roles are often performed by the same managers at Arup. It is a precondition that interviewees have at least five years of experience and manage projects with a minimum of 100.000 euros of investment cost. This is to make sure that the interviewees have sufficient knowledge and experience with project management.

In order to get a better understanding of the whole context of agile and contracting, also agile experts in the IT industry and a lawyer are interviewed. This results in the following interviewees:

- 5x Project / contract managers – with knowledge about agile project management
- 2x Agile IT practitioners
- 1x Building law lawyer

Interview set up

Interviews will be conducted face-to-face. First the structured questionnaire about the (implicit) use of agile is given to the interviewees. Interviewees are asked to agree or disagree on statements about agile project management. The Likert scale 1-5 (disagree - agree) is used for the questionnaires. An interviewee should alternately disagree (1) or agree (5) with certain statements in order 'to be agile'. By doing so, it is prevented that interviewees disagrees/agrees with all statements just to be agile. The template of the structured questionnaire can be found in appendix C.1.

The open interview starts when the structured questionnaire is finished. These interviews were semi-structured. Semi-structured means that there is room for dialogue/discussion. There are two viewpoints for doing such interviews. The first is to ask interviewees to imagine a case and to answer all questions based on that specific case. The second is to ask interviewees to provide answers based on their over-all experience. The latter option is chosen because it gives a better insight of the whole

²⁶ With implicit use of agile is meant the use of agile without explicitly calling it agile. For example, this can be in terms of communication or collaboration, as Patel, Lycett, Macredie and Cesare (2006) describe in their research about agile.

context. Examples can come from a single project – nevertheless the interview will be about the general experience of the interviewee.

The structured questionnaire is English. However, since all interviewees are Dutch, the open interview is performed in Dutch to prevent miscommunication. The template of the open interviews can be found in appendix D.1.

Results

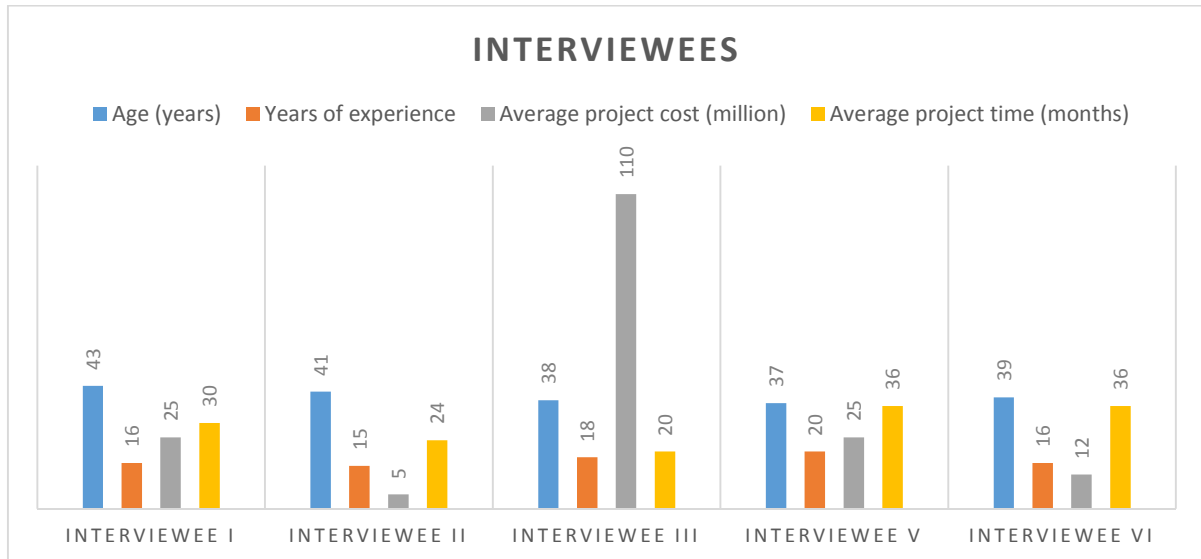
If permission was granted, the interviews are recorded and thereafter written down as a transcript. Interviewees will be referred to as numbers (e.g.: I, II, III). It is decided to only write down the transcript of the project/contract managers, this because this information is of most relevance to this research. The other interviews are only used to get a better understanding of the context.

The transcripts can be found in appendix D.2-D6 and is summarized in paragraph 3.2.3.

3.2 Results of the exploratory interviews

3.2.1 Statistics of interviewees

In this paragraph background information of the interviewees is given. In the chart below the information of the interviewees is shown: age, years of experience, average project cost and average project time. In the subsequent table, more information per interviewee is shown: gender, educational background and used management styles.



	Interviewee I	Interviewee II	Interviewee III	Interviewee IV	Interviewee V
Gender	Female	Male	Male	Male	Male
Educational background	Building Technology (WO)	Architecture (WO)	Architecture (Post-HBO)	Architecture (WO) and MBA	Architecture (HBO)
Management styles	PRINCE2, IPMA, GROTIK, combination of existing tools	PRINCE2, PMBOK	PRINCE2, Agile(PM) combination of existing tools	PRINCE2, APM, GROTIK, AgilePM, combination of existing tools	GROTIK

All interviewees meet the pre-conditions of having a minimum of five years of experience and projects with at least 100.000 euros of investment cost. It is noteworthy that interviewee III is managing projects with significant more investment costs – this is because interviewee III is a programme manager as well. All interviewees have a technical background and four out of five are men.

Furthermore, it appeared that currently at Arup Amsterdam multiple management styles are used:

- PRINCE2
- G(R)OTIK
- IPMA
- AgilePM (formally known as DSDM Atern)
- Combination of existing methodologies/tools

The first three bullets are considered as conventional methodologies. The fourth bullet is a tool of agile project management. *Tailor made project management* is also mentioned multiple times

during the interviews. Project managers pointed out that they always try to tailor whatever kind of method to a specific project and context. This can often be seen as a combination of existing management methods.

3.2.2 Structured questionnaire: use of agile project management

In this sub-paragraph the results of the questionnaire are shown. The template of the structured questionnaire can be found in Appendix C.1. The results of the questionnaire are shown in the table below.

As explained, interviewees had to alternately agree or disagree in order to give an 'agile answer'. In the table below however, these scores are 'adjusted': 1 (conventional) - 5 (agile).

It is interesting that two out of the five interviewees did not understand question 13. This can imply this question was not clear, or the interviewees were not familiar with this statement. Therefore, this question is not used during the analysis of the data.

Statement	Interviewee I	Interviewee II	Interviewee III	Interviewee IV	Interviewee V
1	4	4	2	3	4
2	4	2	4	2	4
3	3	4	3	3	4
4	3	3	4	3	2
5	2	3	5	4	5
6	4	4	4	3	4
7	4	2	4	2	4
8	2	2	3	3	1
9	4	2	3	3	5
10	4	3	4	4	5
11	1	2	2	2	5
12	2	3	3	3	2
13*	-	-	-	-	-
14	1	3	3	3	2
15	3	3	3	3	1
16	2	4	4	5	5
17	1	5	2	4	4
Average	2,6	2,9	3,4	3,1	3,4

*Excluded because not every interviewee responded to this question

The conclusion of these results will be discussed in the next paragraph (§3.3).

3.2.3 Open interviews

In this section a summary of the open-interviews is given. The open interviews are used to better understand issues and opportunities of agile contracting and to fill the gap between literature and practice. Most interviews were successful, although not always all questions could be asked due to time constraints.

Key aspects that came forward in terms of agile contracting:

- Interviewees addressed that a lot of disputes can be solved due to a *proper relationship* between parties. A proper relationship can also prevent escalation of conflicts. Only one interviewee had experience with a conflict which escalated to court. Others had experienced conflicts as well, but always found a way out without coercive measures due to *proper relationship management*. However, interviewees addressed that the contract was helpful in these cases as well: parties could refer to agreements in the contract.
- The agile principle of *'respond at the last responsible moment'* was mentioned in each interview to become an issue when using conventional construction contracts. This is because this principle will cause *adjustments to the scope* (Dutch: *'meerwerk'*) on a regular basis. Right now, adjustments of the scope appear to be a returning point of discussion during each project. These adjustments often cost extra time and money, which gives reasons for conflicts between client and consultant. Interviewees suggested that a different payment system (different than fixed price) could help to solve this problem.

Only interviewee III was convinced that a scope could completely be pre-defined (this is also confirmed by the answers to the first statement of the structured questionnaire). The other four interviewees mentioned that the scope is always changing in the front-end development and said *functional requirements* could be a good alternative for pre-defined end-results.

Furthermore, when there are scope changes, each interviewee underlined the importance of documenting final decisions. This can be in writing, minutes, or just by a simple e-mail. Discussions later in the project can be prevented this way.

- Interviewees foresaw problems in *calculating the price* when the scope is not completely defined up-front. No consensus is found in a preference for reimbursable versus fixed price contracts in perspective to agile project management. Project managers mentioned that they had to clarify their activities more with *reimbursable contracts* than with fixed price contracts. This is sometimes seen as a hassle. On the other hand, reimbursable contracts give less stress for the profitability of Arup and suppliers in general. *Fixed price contracts* give project managers more freedom and often less involvement of the client during the project. But, it often results in conflicts if the client requests scope changes (because of *internal or external reasons*)
- Project managers also pointed out the difficulty of *involving clients in projects*. Sometimes even simple communication appeared to be problematic. Interviewee V said: *"When all the requirements are set in the beginning and it is only the consultant's concern to deliver these. This does not trigger any communication or transparency during the project."* With conventional project management and a proper fixed price contract this is seen as less of a problem because it is just the supplier's job to deliver the predefined scope. However, this can become more challenging when working with a more 'open' or 'agile' contract. Then the supplier is more dependent on the client: the evolving scope is defined *together* with the client *during* the project.

Interviewee II also emphasized the communication between parties and even stated: “*Communication failure can be seen as the source of all the conflicts*”. Right now Arup often includes the organizational scheme in the tender – which again is included in the contract. Despite this, projects have occurred where not everyone’s role nor responsibility was clear.

- *Liability* appeared to be one of the focus points in the current contracts. Arup, as an engineering company, does not want to bear too much risk. For each project the biggest risks are investigated and if possible mitigated in the contract.

Also, it was mentioned that due to liability documents are sometimes withheld from the client until they are completely validated. Project managers and engineers are afraid they are held liable for providing wrong information. This way of behaving can be problematic while working agile. With agile clients are part of the team, therefore there should exist a culture of ‘no blame’ and ‘trust’ in the team. Agile methods state that sharing information could help to speed up the process and creates understanding of the client.

- The *ownership of documents* should be documented in a better manner if organizations want to work agile (*transparency*). It appeared that Arup already experienced some difficulties. In the project where Arup tried to implement aspects of Agile, both the client as Arup delivered data for a model. Hereafter, both parties felt ownership of this model, while Arup strongly feels this model is part of the intellectual property of Arup.

The open interview template can be found in appendix D.1. The transcripts of the interviews can be found in appendixes D.3 – D.6.

3.3 Conclusion of the exploratory interviews

Structured questionnaire

Most interviewees tended towards a more conventional project management style. This is not surprising, since Arup Amsterdam just started trainings to educate the Programme and Project Management (PPM) department in agile project management. However, it was notable that interviewees answered to each agile statement in a non-consistent manner: many deviations were observed. It was not in line with the expectations: a more consistent result per interviewee was expected.

An explanation may be that interviewees mentioned that they sometimes use a *combination* of existing tools to manage projects. Hence, it could be that there exists a 'grey area' between conventional- and agile project management. This can also imply that the differences between conventional- and agile project management, as showed by literature (chapter 2), might not be as straightforward in daily practice.

Another explanation could be that the interviewees were asked to fill in the questionnaire based on *general* experience, while a project management style is often tailored to the specific project. One interviewee (III) commented that – therefore – he found it hard to answer the questions in a consistent manner.

Open interviews

Similar contractual concerns, due to agile project management, came forward as discussed in the literature review (chapter 2). Interviewees suggested to focus on the following aspects:

- *Relationship between parties*

Interviewees pointed out that – in most cases – problems (of any cause) in a project could be solved due to *proper relationship management*. The contract therefore should capture agreements that motivate good communication and understanding among parties. This confirms the outcomes of the literature study. However, no specific ideas about such clauses were suggested.

- *Scope and financial provisions*

Interviewees confirmed the predicted concerns in (1) capturing the scope in the contract and (2) managing change requests – as a result of an evolving scope.

Describing a project with functional requirements, was mentioned as method to capture the scope in a more flexible way. Additionally, interviewees foresaw problems in *calculating the price* if the scope is not completely defined up-front.

- *Organisational*

Project managers also pointed out that it is hard to *involve clients in projects*. Sometimes even simple communication appeared to be problematic. Right now, Arup includes the organizational scheme in contracts. This scheme should be updated to agile project management, which is not the case at present.

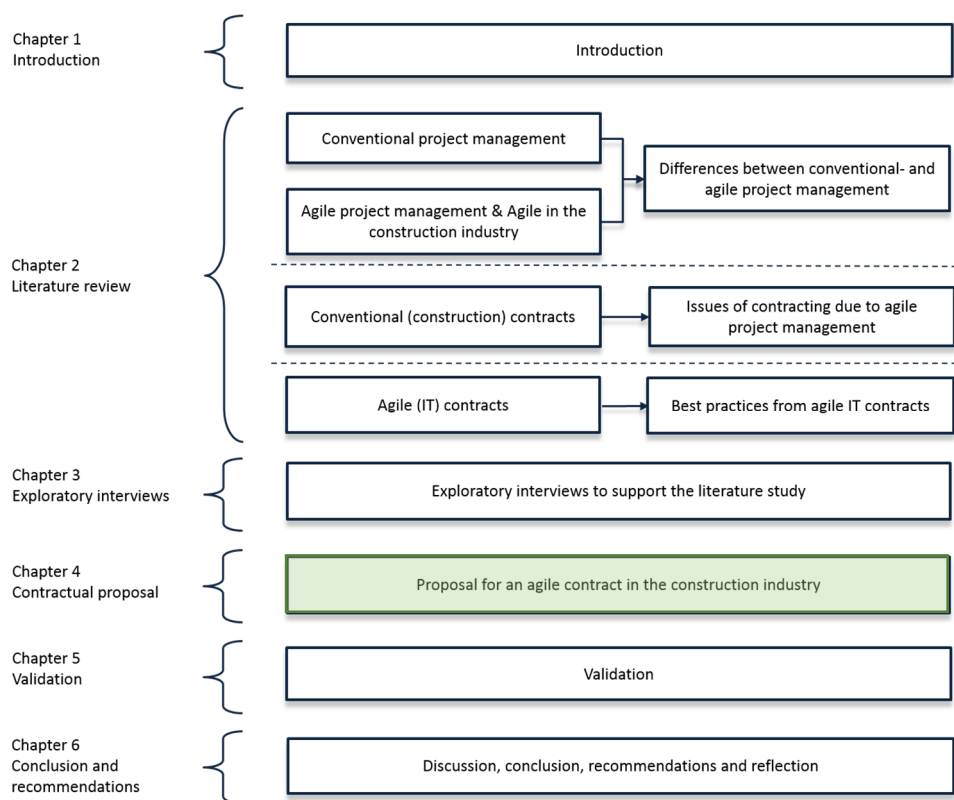
- *Ownership of the end-result and liability*

It appeared that Arup had already experienced complications with the ownership of documents in a (partly) agile project. Caused by intensive co-creation, both parties felt ownership of the intellectual property. One interviewee mentioned that the same can happen with the willingness to be liable for the end-result (interviewee IV).

It was also brought up that – due to the current liability clauses – documents are sometimes withheld from clients until these documents are completely validated. This mindset could hamper a cooperative (agile) management approach.

Chapter 4

Research



*“If we knew what it was we were doing, it would not be called **research**, would it?” Albert Einstein*

4 Research

In this chapter research findings of this thesis will be discussed. Recommendations will be given for an agile construction contract for the front-end development phase. In paragraph 4.1 the *methodology* will be explained. The *research findings* itself can be found in an additional booklet, this will be explained in paragraph 4.2.

4.1 Methodology

The findings of the literature review (chapter 2), and the exploratory interviews (chapter 3) will be used to coin the contractual recommendations. Together, these recommendations will form a proposal for an agile construction contract based on *The New Rules 2011 (DNR 2011)*²⁷. This contractual proposal consist of the following two sections:

(1) Proposal for an Agile Contract

The literature review resulted in several key concerns which should be addressed in an agile construction contract. These concerns came forward by analysing the DNR 2011 – which are the typical general terms and conditions for the construction industry – in perspective to agile project management (see §2.2.4). Next, agile IT contracts were studied for *best practices* that can be used for agile contracting in the construction industry (see §2.3.3). Additionally, exploratory interviews were performed at Arup to examine the practice of contracting and support the findings of the literature review (See §3.3). All of this formed the foundation for general recommendations to effectively enable agile project management in a construction contract. Hence, part one consists of an agile contractual proposal with the DNR 2011 as its foundations.

(2) Modifications to the DNR 2011

In this section articles and clauses of the DNR 2011 will be discussed. Several modifications will be recommended in order to incorporate the agile contractual proposal of the previous section. It is specified in a table to add, amend or delete articles/clause of the DNR 2011 to effectively enable agile project management.

4.2 Research findings: *Proposal for an Agile Contract*

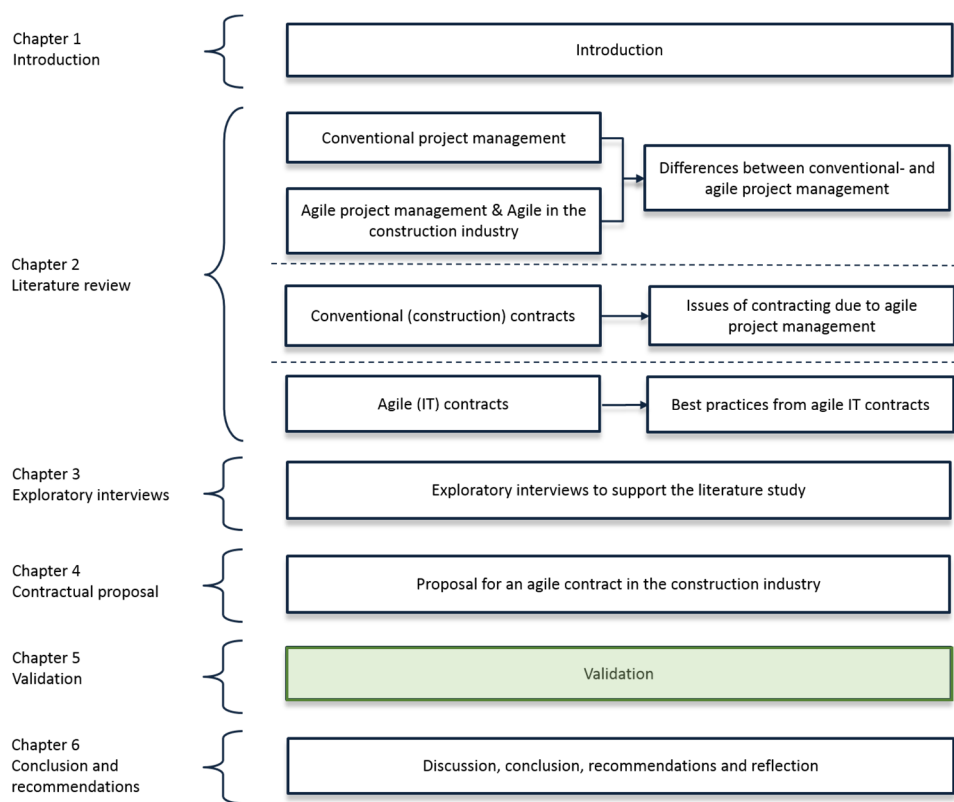
The findings are written as a supplementary booklet in order to make the findings of this research easier to implement in practice. The proposal for an agile contract is designed as supplementary (separated) document to this thesis.

In the next chapter, the contractual proposal will be validated (chapter 5). After validation, the proposal will be revised to the conclusion and recommendations of the validation. These adjustments result in a new version of the contractual proposal: this will be the end-result of this thesis. **This renewed proposal will be presented as a stand-alone booklet. This booklet can be found in appendix F.**

²⁷ Reminder | DNR 2011 is the Dutch abbreviation of The New Rules 2011 (Dutch: De Nieuwe Regels 2011). The abbreviation DNR 2011 will be used in this thesis.

Chapter 5

Validation



“It is not the strongest of the species that survive, nor the intelligent, but the one most responsive to change” – Charles Darwin

5

Validation

In this chapter the research findings from the preceding chapter will be validated by expert interviews. First the *methodology* of the validation will be explained (§5.1). Then the *results* of the validation will be discussed (§5.2). Lastly, a *conclusion* of the outcome of the validation can be found in the last section (§5.3).

5.1 Methodology

Target groups

Because a contract is an agreement between two (or more) parties, both client and supplier will be interviewed. At Arup Amsterdam project managers also manage contracts, so there is no distinction made between project managers and contract managers. Both managers, experienced with agile project management as well as conventional project management, will be interviewed. Consequently, the agile contractual proposal is validated by an agile- and a conventional viewpoint. Since it is hard to discuss agile contracting without any knowledge about agile management, all interviewees must be at least familiar to agile. This results in the following target groups for the expert interviews:

- 3x Project / contract managers – experienced with conventional project management and knowledge about agile project management
- 3x Project / contract managers – with knowledge and experience about agile project management
- 3x Clients – with knowledge about agile project management

At least three interviews will be held per target group so that triangulation is possible. Triangulation is cross-checking data from multiple sources to search for regularities in the research data (O'Donoghue & Punch, 2003).

Interview set-up and selection of participants

The interview consists of three parts. Interviewees are selected based on their knowledge about project management and contracting. This is done by the following two questionnaires:

- (1) A *general questionnaire* for personal and general information (see appendix E.1). Just as with the exploratory interviews, it is a prerequisite that interviewees manage projects of a minimum of 100.000 euros of investment cost and have at least five years of experience. This is done to make sure that they manage substantial projects.
- (2) A *structured questionnaire* for understanding to what extent the interviewees apply *agile-* or *conventional* project management (see appendix C.1). By doing so, interviewees can be classified in the right target group. The same questionnaire is used as in the exploratory interviews. Therefore, the methodology of this questionnaire can be found in chapter 3.

After selecting the interviewees, the following 'expert interview' is conducted:

- (3) A *semi-structured open interview* for validating the recommendations for agile contracting in the construction industry. Sometimes *specific* questions about certain aspects are asked, but generally, more *open* questions are used. Hence, it is possible to start a discussion to avoid the risk that closed-ended questions exclude certain things. For several clearly defined aspects questions are asked if interviewees agree with the proposed recommendations – and/or if they miss certain provisions. Also, it is inquired if interviewees would foresee certain issues due to the proposed recommendations. Because the questions are asked *per aspect* it is easier to compare the results with a qualitative data analysis (see appendix E.1).

Interviews will be held face to face and with one expert at the time. The interviewees receive the *Proposal for an Agile Contract* a week in advance. Interviewees are expected to read the whole document before the interview starts. This makes it possible that interviewees have already ample time to think about it – this also saves time during the interview itself.

The set-up will be verified with a 'test-interview'. This will test the set-up and will measure the duration of the interviews.

Results

The open interviews will be recorded and written down as transcripts. All answers (or only essential parts of these) of the experts are put in a table to compare results. This table contains all questions and participants in a clear and visible way and can be found in appendix E.8.

The answers to the *structured questionnaire* (see above under point 2 on the previous page) are used when analysing the answers to the *open interview* (see under point 3 on the previous page).

For example: if an interviewee disagrees with the agile principles of responding to change (and therefore keeping the end-product variable), then his opinion about capturing the scope and change management in the contractual proposal, carries less weight. This set up makes it easier to perform a qualitative data analysis of the expert interviews.

Answers to the following statements of the *structured questionnaire* are added to the following sections of the *open interview*:

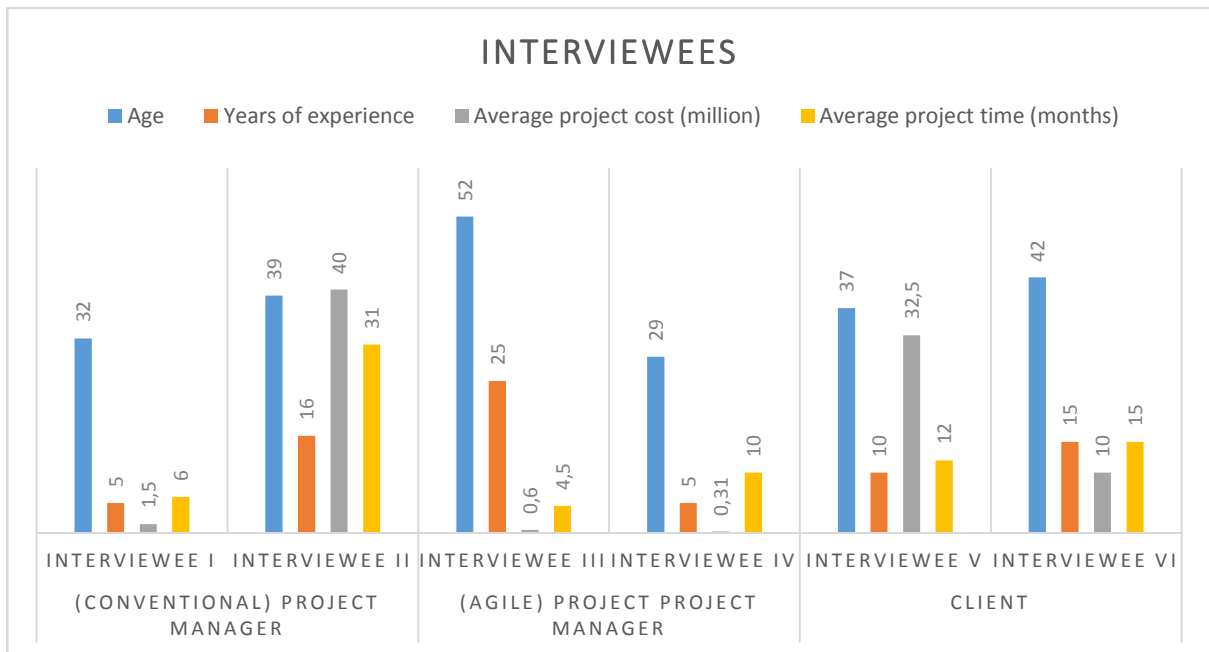
- All answers to the *open interview* in relation to the contractual aspects of 'Scope' are compared with the following statements of the *structured questionnaire*: 1/15/17 (see appendix C.1 and E.1).
- All answers to the *open interview* in relation to the contractual aspects of 'Organizational / Decision making / General obligations' are compared with the following statements of the *structured questionnaire*: 4/5/6/10/12/14 (see appendix C.1 and E.1).

5.2 Results of the validation interviews

Own observations made clear that – despite the selection criteria – interviewees did not always have enough knowledge about agile project management. It is hardly possible to discuss agile contracting if the interviewee is not sufficient familiar with agile project management itself. Therefore, per target group, one interviewee with the least knowledge of agile project management has been excluded from the results. This means that only *two* interviews per target group were written down as a transcript – only these data are used in this research.

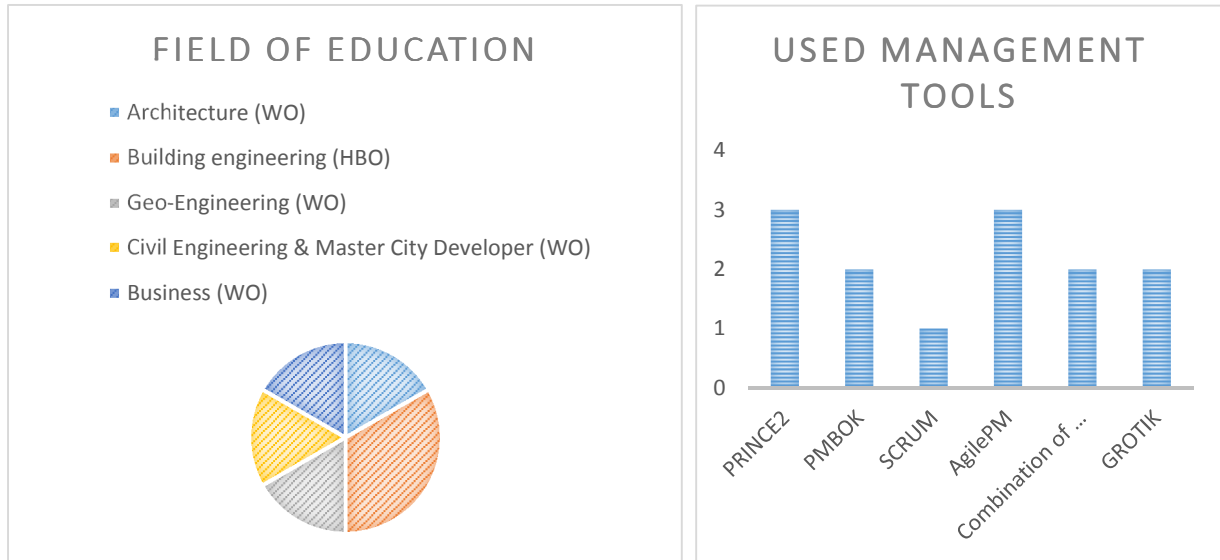
5.2.1 General questionnaire

In the charts (see below) data of the interviewees are shown. Only data of interviewees whose interview is transcribed, are shown.



As shown by the chart, agile project managers do manage projects that involve considerably less investment costs than conventional project managers. It interesting to mention that the two agile project managers (very) recently started to use agile, even though one of them has a relatively long working experience.

In the charts below the educational background of the interviewees and the number of management tools used by the interviewees are shown. In the subsequent table below, this information is illustrated per interviewee. All experts have a technical background except for one client, who has a background in business. Both clients are – or have been – project developers in the Netherlands.



	Conventional project manager		Agile project manager		Client (project developer)	
	Interviewee I	Interviewee II	Interviewee III	Interviewee IV	Interviewee V	Interviewee VI
Gender	Male	Male	Male	Male	Male	Male
Educational background	Architecture (WO)	Building engineering (HBO)	Geo-Engineering (WO)	Building engineering (HBO)	Master city developer (WO)	Business (WO)
Management styles	PMBOK	PMBOK and GROTIK	PRINCE2, AgilePM, SCRUM, combination of existing tools	PRINCE2, AgilePM	PRINCE2, AgilePM, combination of existing tools	-

The table above shows which educational background and which management style belongs to a specific interviewee. During the interviews, no link could be found between the educational background of the interviewees and their answers.

Also no link could be found between the management styles that interviewees used. Especially the latter one is notable, because the conventional project managers did not even use agile project management. The fact that no difference was found, might be because of the 'grey area' between conventional- and agile project management. This grey area was noticed before during the exploratory interviews. Also, the two agile project managers just started to use agile project management. Therefore, they are probably not yet (completely) accustomed to work agile.

5.2.2 Structured questionnaire: use of agile project management

All project managers filled in a questionnaire, which shows seventeen statements with which they must agree or disagree on a scale of 1 (conventional) - 5 (agile). The results of the questionnaire about the use of agile project management are shown in the table below. As expected, project managers with experience in agile project management have a relatively higher score than project managers with only experience in conventional projects. But it is remarkable – similar as was noted before – that the differences between the total averages do not differ much. This can be the result of a failure in the design of the questionnaire. For example, the average is calculated without giving individual statements a certain weight. It might be that certain statements are more crucial in order to be agile than others. Another explanation can be the *grey area* between agile- and conventional project management. It was expected that it might occur here as well.

The average scores of project managers are 3.4 to 4.0. It is remarkable that during the exploratory interviews the range of these average scores were lower: 2.6 to 3.4. This means that on average ‘more agile’ project managers are interviewed during the validation. This can be explained by that during the validations the selection criteria of knowledge about agile project management were stricter. As discussed in the beginning of this paragraph, interviewees with the least agile knowledge were excluded from the qualitative data analysis. Also, these interviewees were found after a selection of agile project managers with not only knowledge about agile, but also with *experience* in the field of agile. This selection was more thorough than during the exploratory interviews. During the exploratory interviews only knowledge about agile was required.

Nonetheless, these results are also used to get a better insight in someone’s management style, rather than it is a strict tool to determine if someone is agile or not. As already discussed in the methodology, this helped during the qualitative analysis of the data, to understand answers of the open interviews.

Statement	Conventional project manager		Agile project manager		Client	
	Interviewee I	Interviewee II	Interviewee III	Interviewee IV	Interviewee V	Interviewee VI
1	4	2	5	4	4	4
2	4	4	4	4	2	4
3	4	4	4	4	3	3
4	4	2	4	3	4	4
5	2	5	5	3	4	5
6	4	4	4	4	4	4
7	4	4	3	5	5	4
8	3	1	3	2	2	3
9	4	5	5	4	5	3
10	4	5	5	4	5	4
11	4	5	2	4	3	2
12	3	2	5	3	4	3
13*	*	*	*	*	*	*
14	3	2	4	4	2	3
15	3	1	4	3	3	3
16	3	5	4	5	4	4
17	2	4	3	3	4	2
Average	3,4	3,4	4,0	3,7	3,6	3,4

*Excluded because not all interviewees responded to this question.

The template of the questionnaire about agile- and conventional project management can be found in appendix C.1.

5.2.3 Open interviews

In this section the data that came out of the qualitative analysis will be discussed. The results will be discussed per contractual aspect.

After the analysis, it became clear that there is no distinction between agile- and conventional project managers. But it is possible to make a distinction between both the supplier (i.e. agile and conventional project managers together) and the client. Therefore, if dissimilarities in answers are observed, only clients and suppliers are distinguished.

Under the aspects 'scope' and 'organizational/decision making/general obligations', the link will be made between answers given to the *open interviews* and *structured questionnaire*.

Pre-conditions of a contract

Relationship between parties

Both client as supplier agreed that a proper relationship between parties is one of the most important criteria before signing a contract. However, most interviewees emphasized that trust cannot be captured in the contract: "Trust exists, it arises or it will never be there" (Interviewee II – client).

An agile way of working can help to maintain – and even help to create – trust. Yet, checking this relationship upfront is not always easy. Suggestions were made to look at reference projects of suppliers or clients. If this was not possible, it was advised to test the relationship with small projects or only start with one sprint. Interviewee VI (client) mentioned to ask a parties' trusted network about the reputation of a supplier before starting a project.

Check if a project is fit for agile

Suppliers were affirmative about the idea of a mutual kick-off (or workshop) with all project members – especially because agile is relatively new in the construction industry. They mentioned that in most projects the pre-conditions, described in contractual proposal, were not tested before the start of a project. One supplier (interviewee III) suggested to introduce a decision tree to test if a project is fit for agile.

On the other hand, clients were afraid about the time that these kind of recommendations would take. They preferred to collaborate with parties, with whom they have worked before. Under such circumstances, clients did not believe it was necessary to organize a mutual kick-off. Be that as it may, when working with new parties, they both agreed that a proper organised mutual kick-off could be useful.

Contract

Overall: the contract should focus more on processes (agile processes) and relationships instead of pre-defined results.

Both target groups agreed that – in an agile contract – there should be a focus on agile processes rather than a focus on defining end-products. Especially interviewee V (client) underpinned that an agile contract should describe how to get to the end-result, instead of defining the end-result.

Nevertheless, both clients would like to have control on the progress. Interviewee VI (client) suggested that an external company could focus on testing the *processes* instead of (only) the *results* of the supplier. Payments will be postponed if this external company indicates that the supplier does not work on base of (sufficient) agile processes.

Scope

(On basis of the questionnaire mainly the answers of interviewee I, III, IV, V, and VI are taken into account. Interviewee II did not agree with an agile way of working in general (statement 1/15/17 of the questionnaire). With interviewee II mainly the applicability of agile project management, rather than an agile contract was discussed.)

Three suppliers (I, III, IV) thought it would help to describe – together with the whole project team – projects in small functional pieces (requirements). It was believed that due to the prioritization of requirements, the teams are obliged to think thoroughly about the way to get to the end-result, instead of the end-result itself.

Two suppliers suggested to use governance products, such as minutes and phase documents, as part of the contract. Via this way the scope can evolve and the contract can become a ‘living document’.

During four interviews it was needed to sketch the outline of the scope description to make the ideas clear. Therefore, interviewee I and III (supplier) suggested to add a figure as an impression of how the scope should be captured in the contract.

One client (interviewee V) shared same thoughts with the suppliers. The other client (interviewee VI) was afraid about the time that this approach would cost. However, this can also point out that this client is not ready for agile, since this kind of client involvement is seen as critical in agile project management.

Financial provisions

The ‘expert interviews’ confirmed that the proposed payment options are better applicable when the end-product is uncertain (which is often the case during the FED phase) and less applicable when all the requirements are clear.

- Option one: fixed price, fixed time, variable scope. Suppliers thought this option would be well-applicable, IF the client realizes that the scope is variable. Suppliers stated that they foresaw problems in the mentality of the client.
Conversely, no client had difficulties to accept that the scope would be flexible, as long as they would *trust* the supplier. Both clients underlined that a clear budget is seen as very important. Yet, they also pointed out that the cost of the FED is relatively small compared to the cost of the project as whole. This means that if the design phase turns out to be 10% more expensive, this would matter less than an increase of 10% in the execution phase.
- Option two (shared pain/gain) was received well by all target groups, this way the team could possibly work more efficiently. However, it should be mentioned that no supplier had ever worked this way before during the FED phase.
- Both target groups were not very optimistic about option three (reimbursable). Clients wanted to have more certainty (control) and suppliers thought cost could go out of control. Nonetheless, interviewee II affirmed that this option could be useful when quality is the main concern.

Additionally, all interviewees believed that the aspect of *trust* and a *proper relationship* are the most important prerequisites to be able to agree on the financials without disputes.

Organizational / Decision making / General obligations

(On basis of the questionnaire mainly the answers of interviewee I, III, IV, V, and VI are taken into account. Interviewee II agreed the least with these aspects of an agile way of working (statement 4/5/6/10/12 of the questionnaire). Again mostly the applicability of agile was discussed during this interview.)

All interviewees (except interviewee II) reacted positively on including the processes and roles/responsibilities of agile project management in the contract in general. However some remarks were made:

- Interviewee I and IV (suppliers) suggested that the location (work place) – and the party who organises this location – should be incorporated in the contract.

- All suppliers reacted positively to capture involvement of the client in a contract. Interviewee III (supplier) said that one of the biggest frustrations of agile practitioners is lack of client involvement. Conversely, both clients were more restrained and were afraid that this would cost them too much time. The interviewed clients also feared that they manage too many projects at the same time to be involved in the proposed manner. It must be emphasized that the client representative does not need to be the client itself, but someone on behalf of the client that he or she trusts and is empowered to take decisions.
- Suppliers believed that because of the current organisational structures of engineering companies, it is very difficult to always work co-located with multidisciplinary teams. Currently, engineers work on several projects throughout the week. Therefore it is hard to get all engineers working on the same project at the same time. Moreover, they expressed concerns that also other stakeholders (like municipalities) in the construction industry would have difficulties to regular attend meetings.

Since the proposed obligations are critical for agile projects, this can also point out that these companies are not ready for an agile way of working yet. It may be that certain options like VC meetings can be a solution.

Liability

Postponed liability was received very well by both target groups. Because the client is critically involved in the development team it is considered as very important that all team members can speak freely, also with the client sitting next to them. Right now clients expressed that they try to establish the same in practice, but do not capture this in contracts.

Ownership and use of rights

Among experts, no consensus was found about the ownership and use of rights. Clients expressed that they often demand to exclude these clauses of the DNR 2011. Using agile project management would not change this. They feel that the current ownership and use of rights gives limitations. Clients want to be the owner – or able to copy or change the design.

On the other hand, suppliers mentioned they would want to keep the ownership of the design as captured in the DNR 2011. Otherwise, when a good idea comes up, a client can terminate the contract and go to another (cheaper) party.

It also appeared that these provisions differ very much per project, but also per party (architect, project manager and engineer). Much discussion came forward out of this aspect.

Termination of the project

No notable comments were made.

The template of the open interview can be found in Appendix E.1. The transcripts of the open interviews can be found in Appendix E.2 – E.7. The table which used to compare the answers of the open interviews can be found in Appendix E.8. This table is too big to be readable on an A4, but is added to illustrate the method that is used.

5.3 Conclusion of the validation

In this section the conclusion of the validation will be discussed. Generally, the *Proposal for an Agile Contract* was well received by all interviewees. Firstly, advantages and disadvantages will be discussed. Secondly, adjustments to the *Proposal for an Agile Contract* will be discussed.

Conclusion

Four main advantages of the proposal came forward during the validation:

- 1) Due to the pre-conditions only the right projects are started in an agile manner.
- 2) The proposed contract requires parties to think in smaller steps to get to the end-result. As interviewee VI said: *“Currently contracts often describe the end-result just as ‘open’, while parties just see how they will reach the end.”* Yet, the contractual proposal obliges parties to think about the steps which are required to reach the end-result. These steps refer to the manner in which the scope is split up in functional requirements (user stories). These requirements are prioritized after each sprint until the end-result is reached.
- 3) Experts expressed that this proposal will oblige a more intensive interaction between client and supplier. All four project managers (suppliers) mentioned that a lack of client involvement is often a reason for much frustration. Capturing this in the contract could set a baseline for better collaboration and involvement.
- 4) In addition to the previous point, the ‘agile clauses’ that embed agile project management in the contract give more tools and a more solid ground to work closely together. This refers to the recommendations that are given underneath the aspects of *organizational, decision-making* and *general obligations*.

Not only advantages were seen by interviewees. Experts were concerned about the intensity that is proposed. This refers mainly to the intensity in terms of client presence and co-located teams that must work simultaneously:

- 1) Clients expressed their concerns about the time it would cost to be involved in projects as recommended by the contractual proposal. On the other hand, as mentioned above, project managers merely saw advantages in more client involvement.
- 2) Both parties worried about co-located and simultaneously working teams. However, these points can also be considered as concerns about the implementations of agile project management.

Furthermore, the following observations were made during the validation interviews:

- No significant difference is found between conventional- and agile project managers.
- Client and supplier both had different viewpoints on mainly two aspects of the proposal: *involvement of the client* and *ownership of the solution*. The latter one needs future research, no consensus was found.
- The construction industry as a whole may not be ready for agile project management yet. However, examples of projects where agile project management was (partly) applied are observed.

Adjustments to the proposed agile contract

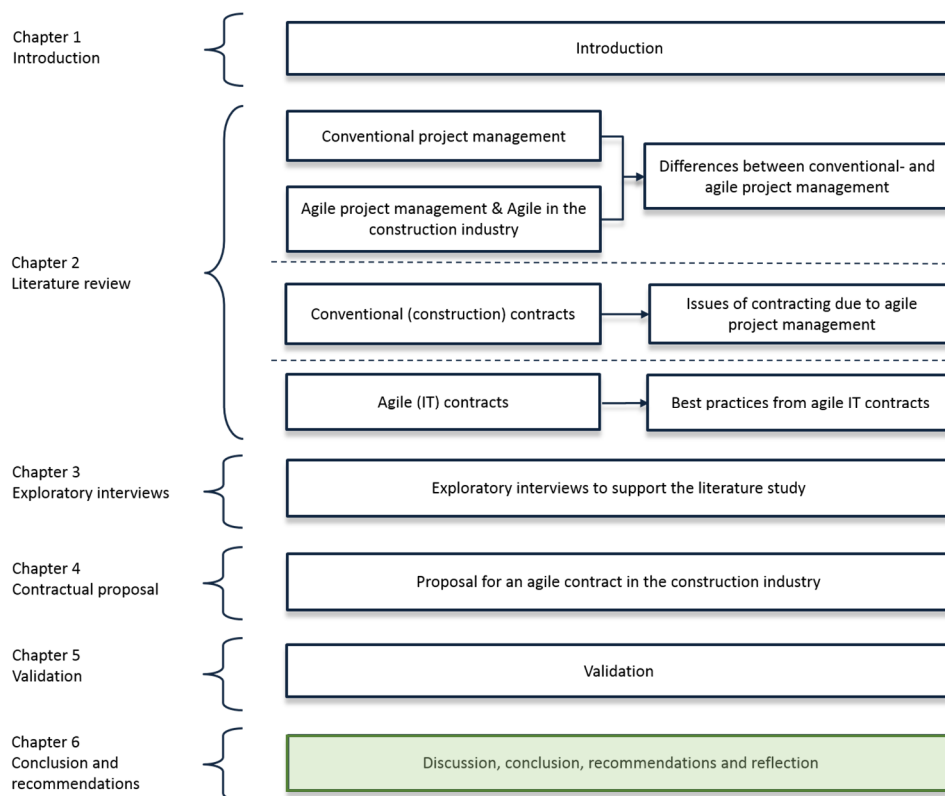
As a result of the validation several adjustments are proposed to the *Proposal for an Agile Contract*. These changes are not proposed according to one single answer but a consensus of answers of different interviewees. The changes are listed below and adjusted in the final proposal.

- If there is no trustworthy relationship between parties yet (for example: no past experience), it is recommended to start only one sprint. This allows to check the relationship between client and supplier in practice. The project can continue if this sprint appears to be successful.
- Figure 2 in the proposal is deleted. The figure was not clear to all interviewees. The figure was designed to clarify the fact that contract would focus more on processes rather than end-results. It is decided this will be explained with text instead of an image.
- A template of the scope description is added to the proposed contract. This template must clarify the scope description. It was needed during four interviews to sketch the manner in which the scope should be captured.
- It is added that teams can also use VC (Video Conference) meetings to involve all team members (and client) during agile ceremonies. However, it is emphasized that co-located workplaces and face-to-face communication are strongly preferred.
- It is suggested to add *the location* and the *party who organizes the location* for the co-located teams to the contract.
- As discussed, no consensus was found among the experts about the ownership and use of rights. It appeared this aspect is very project specific. For small repetitive projects it is advised to keep the same clauses as in the DNR 2011. For large complex projects it is recommended to tailor these clause to projects. However, more research is needed.
- It is suggested that – if parties have a lack of agile knowledge – an external company tests the agile processes of the supplier (and/or client). This party will test if the parties does comply with the agreed agile way of working that is proposed in the contract.
- In addition to all above, minor things are adjusted in the new version, like: layout, spelling, and writing style.

The proposal will be revised to these recommendations. These adjustments results in a new version of the contractual proposal: the end-result of this thesis. The renewed proposal will be presented as a stand-alone booklet. Also, it can be found in Appendix F.

Chapter 6

Conclusion and recommendations



"The key to success is often the ability to adapt." - Anthony Brandt

6

Conclusion and recommendations

In this chapter, all findings of this research will be synthesized. In the first paragraph (§6.1), *answer is given to the main research question*. Next, these findings are presented in the *discussion* (§6.2), followed by *recommendations* (§6.3). The last paragraph (§6.4), contains a *personal reflection* on performing this research and writing this thesis.

6.1 Conclusion

In the following paragraph, the conclusion of this master thesis will be expanded. Firstly the research objective and research relevance will be discussed. Subsequently answers to the sub-questions, followed by the answer to the main research question is given.

Literature showed that agile contracts are essential to effectively enable agile project management in projects. However, since no agile construction contract exists, the main objective of this thesis was to fill this gap of knowledge. Hence, the following research question was developed:

How to effectively enable agile project management through construction contracts?

Before looking at agile construction contracts, it is crucial to consider if agile project management itself is applicable in the construction industry. Because agile is a relatively new management style in the construction industry, little research has been done on this topic. Yet, all existing literature agrees that agile project management is applicable in front-end development. Studies show that resources could be used more efficiently during this phase. Main arguments are *shorter iterative cycles* and *more frequent reconciliations with the client*. Consequently, this research is focused on the front-end development phase of a construction project.

Answer to the sub-questions

In this section the sub-research questions are answered one by one. The answers to these questions together lead to the answer of the main research question, which will be discussed in the succeeding sections (Sub-research question 1 – 3).

Sub-research question 1

Firstly, the differences between *conventional-* and *agile project management* must be clear to find out how conventional contracts – which are based on conventional project management – can be changed to contracts that suit agile. This results in the first sub-research question:

What are the differences between conventional- and agile project management?

In literature, a clear contrast could be found between both management methods. Five main differences can be distinguished:

- (1) Agile project management *embraces and responds to change*, instead of resisting to change during the project. Agile sees change as a chance to improve value of projects.
- (2) Agile emphasizes that – in order to respond to change – it is necessary to *develop an end-product evolutionary*, instead of defining requirements up-front. Agile highlights defining value up-front as something to strive for. However, a present-day increase in complexity and uncertainty causes that defining the requirements up-front is less appropriate.
- (3) Agile methods stress *iterative development* to be able to develop in an evolutionary way. Agile distinguishes itself from conventional methods by a very short time span (weeks instead of months). This causes the feedback cycles to be accelerated, and makes the process more

dynamic. After each iteration a ‘finished’ product is delivered. Due to this, early value delivery is possible.

(4) Agile teams are small, empowered, co-located and multi-skilled. This allows the team members to be innovative due to dense (face-to-face) communication. With conventional project management, teams can be larger and are organized per discipline.

(5) Agile emphasises that client and supplier work closely together to a shared goal. The *client is part of the development team*. Intensively involving clients must prevent wrong expectations and support mutual understanding about the product and process. Conventional project management aims to inform the client, but does not actively involve the client in the development team.

In practice (from the exploratory interviews) it appeared there is a grey area between both management methods. The line between both management styles is often blurred, and regularly a combination of both methods is used. However, since the interviewees just started to use agile project management, it might be that these project managers did not use agile project management to its full potential. Should a solid agile approach be implemented, even more benefits could be achieved. This is supported by various studies that state that only ‘real agile projects’ achieve benefits, such as *client satisfaction* and *higher value delivery*.

Sub-research question 2

Based on the current standard General Terms and Conditions for the construction industry – *The New Rules 2011 (DNR 2011)* – the following contractual concerns were found due to the differences of agile- and conventional project management. This is the answer to the second sub-research question:

What are concerns – in perspective to agile project management – with existing construction contracts?

Firstly, a solution must be found to cope with an *evolving scope* in a contract. Conventional construction contracts are usually fixed in scope, time and budget. Agile practitioners see these fixed agreements as a threat to the agile principle of ‘responding to change’. In order to respond to change, it is necessary that the end-result is evolutionary developed – instead of predefined and fixed up-front.

This flexibility of scope also has its implications for the *financial provisions* in a contract: how to define payment and award methods when the scope is evolving?

Moreover, this attitude of responding to change means that parties do not know when a project will be finished: the termination of the project and thus the *termination of the contract* may be unclear.

Secondly, different *organizational schemes* and *roles and responsibilities* must be captured in agile contracts. Contracts should envision how parties are going to collaborate and how projects should be carried out. Consequently, the different roles and responsibilities have its implications on covering the *liability* and *ownership of the end-product* in the contract.

Thirdly, the *pre-conditions* for an agile project must be considered. Not all projects are fit for an agile approach. It appears that the *relationship between parties* and *the suitability of a project for agile* are key for a successful agile project – and thus for an agile contract.

Sub-research question 3

To come up with solutions for these contractual concerns, this research looks at the IT industry. Because agile project management was founded in the IT industry, this research assumes that the IT

already has profound experience with agile contracting – for better or for worse. This results in the third and last sub-research question:

What are the best practices from agile IT contracts, which can be of interest for the construction industry?

During the literature study it appeared that – despite the popularity of agile project management in the IT industry – a common view on how to reach this in an agile contract does not exist yet. Most models try to provide more flexibility in defining the scope and try to find different ‘risk sharing’ payment methods to cope with a variable scope.

In general, agile IT contracts do not define the end-result in detail, but try to define processes, roles and responsibilities of each party. In other words: an agile contract rather defines steps to get to the end-result than the end-result itself. Consequently, an agile IT contract embeds agile project management processes in the contract.

It also appeared that there is a strong emphasis on *pre-conditions* in agile IT contracts. Authors of agile IT contracts recommend to test *the relationship between parties* and *fitness of projects and organizations for agile* with workshops, or even questionnaires.

Answering the main research question

The answers to the sub-questions together have led to the answer of the main research question: *How to effectively enable agile project management through construction contracts?*

The answer to this research question has led to an additional booklet: *The Proposal for an Agile Contract* (see appendix F). The first section of this proposal is divided into the pre-conditions and the contract itself:

Pre-conditions of an agile contract

Before starting the project and setting up the contract, the following two aspects must be in place:

- *Relationship*

Just as with conventional contracting, proper relationships and mutual trust among parties is key. This research itself does not provide a specific ‘agile roadmap’ to create mutual trust. However, an agile approach helps to stimulate a good relation – and thereby creates trust. This is done by:

- (1) Constantly creating and showing results after sprints.
- (2) Providing full transparency by tools such as Burndown charts, Scrum boards; actively and visibly sharing all information on a daily basis.
- (3) Critical involvement of the client; the client is part of the development team.

Accordingly, in the contract certain agreements are made, like: confidentiality; the availability of necessary technical and agile knowledge; and commitment to conduct services to best knowledge and capacity (DNR 2011, article 11, clause 1, 2). Furthermore, new clauses such as: *obliged client involvement* and *postponed liability* must lead to a mutual cooperative relationship.

- *Fit for agile*

Before starting an agile project, the relative merits and risks of agile versus the conventional approach must be taken into account. Parties must decide which management approach is most suitable considering: (1) culture of both organizations, (2) type of project and (3) availability of recourses.

Contractual agreements

The actual contract can be set up when pre-conditions, which are mentioned above, are met. The agile construction contract must describe how to get to the end-result, rather than the end-result itself. To make this possible, guiding text according to the agile principles is incorporated in the contractual terms and conditions. The following recommendations are given in the proposal for an agile contract:

- Stages of a project must be directly documented in line with agile project management (*sprints*). The contract is not set up per phase nor for the whole project scope, but for 'x' number of sprints.
- Roles and responsibilities in context of agile project management are embedded in the contract.
 - Especially the client's duties are expanded. More involvement is required in terms of daily to weekly communication. The client decides on acceptance criteria for sprints, and constant accepting/rejecting the results of each sprint.
- There should be a commitment for *amount of output (or functionality)*, rather than *detail of output*. Scope description is mainly defined by: *product backlog, sprint backlogs* and *acceptance criteria*. Furthermore, the scope is an *evolving scope*: changes in project scope are possible and are provided at no extra cost.
 - The principles of '*change for free*' and '*timely specification*' shall apply: scope changes are easy and details of scope defined at the '*last responsible moment*'. This means acceptance criteria of a sprint are decided just before the start of the sprint. By doing so, decisions are made when more information is available. At the end of the sprint the results must be tested if they comply with the acceptance criteria of that sprint (this is a go or no-go moment in the project).
 - Constant prioritization of the *backlog* and *updated estimates*.
 - Results are delivered after each sprint. Agile tools like *Burndown charts* and *Scrum boards* must be applied and visible for all team members. This means continuous monitoring of commercial and technical progress.
- Financial provisions: three options are incorporated in the proposal. It is recommended to work with fixed time, fixed costs and a variable scope: with fixed quality. Fixed quality implies: it is agreed that at least a certain percentage of the requirements is completed at the end of the project.
- Possibility of *early termination*. Moreover, when parties are not certain about their relationship, first a 'test' sprint must be conducted.
- Cooperative relationship and direct communication between parties.
 - Moments of '*postponed-liability*' to stimulate open communication. This helps the relationship and transparency through an environment of trust. Parties are able to discuss everything freely, without being liable for the shown data and statement during sprints. But, parties are liable for the results which are presented during the closure of the sprint.
 - Teams must be *multi-disciplinary, co-located* and work *simultaneously*.

The second section of the contract proposal recommends certain modifications to *The New Rules 2011 (DNR 2011)* to incorporate the agile contractual proposal. It appeared that the DNR 2011 already provides flexibility to incorporate most recommendations of the proposal with minor adjustments. Only a few clauses actually have to be deleted or added.

Looking back at the problem statement and the research objective, this study lays the foundation for agile contracting in the construction industry. Moreover, this proposed contract helps to outline the ground rules for further agile collaboration during a project.

6.2 Discussion and limitations

In this paragraph the research will be discussed. In the first sub-paragraph the findings and in the second sub-paragraph the limitations of this research will be expanded.

6.2.1 Research findings

Agile project management is relatively new in the construction industry

Firstly a literature review was conducted to answer the sub-research question. In addition to this, two rounds of interviews were performed: (1) exploratory interviews to support the literature study, and (2) expert interviews to validate the research findings. This means that this thesis has studied results from the past: *literature* and *experience of people*. Yet, agile is not widespread throughout the construction industry. Therefore, a limited amount of appropriate literature and a limited number of experts for the interviews could be found. Most agile practitioners had managed projects in only a moderately agile manner.

Moreover, it was noticed that some people have wrong ideas about the term 'agile'. Agile is no excuse for unstructured or disordered work. Agility is the power to move quickly and make fast, focused decisions. Agile is being capable to respond efficiently to change. But it is more than just pace: as management consultant McKinsey & Company (2016) outlines: "*Truly agile organisations are both stable and dynamic, combining a steadfast core of unchanging governance structures with adaptive elements.*" This was not always observed during this research.

The question here is, whether it was a right decision to investigate agile contracting in construction industry, considering the industries' immaturity in agile project management. However (what can be learned from the IT industry), suppliers can be anxious to start working in an agile manner, while using conventional contracts (with fixed scope/time/cost). Therefore, this research emphasizes that proper agile contracts can facilitate the implementation of agile project management. Agile project management and agile contracts go hand in hand: both should be developed simultaneously.

As a conclusion, overall observations in this research show that the construction industry is still beyond the concept of agile project management. Nevertheless, this does not mean agile project management cannot be applied in the construction industry: *it takes time*.

As a comparison, it took the ING Bank in the Netherlands well over a year – after finishing an agile strategy – to implement agile project management with full support of the management (McKinsey&Company, 2017). This is only one company in a particular industry – it took the IT industry years to become familiar with agile.

Agile manifesto

The third statement of the Agile Manifesto reads: "*Customer collaboration over contract negotiation*" (AgileAlliance, 2001).

Obviously, this does not mean that contracts are not important anymore. This research shows that *agile contracting* is not only about describing the scope, schedule and payment system (and coercive measures to get what is 'agreed'). But more importantly, agile contracts must set a baseline of how parties should collaborate. Agile contracts must set a mutual understanding about the scope of the project and how to get to the end-result. Hence, it is important that the management style is embedded in the contract.

This means that the result of this thesis is not to refute the third statement of the Agile Manifesto, but this thesis proposes a different ('agile') style of contracting: the contract should enable and reflect customer collaboration. It might be said that the proposed agile contract is a '*contractual code of collaboration*'.

The proposal is fit for agile, but not only suited for agile

Because the contractual proposal is designed for agile projects, it doesn't automatically mean that it is not applicable to conventional projects. Yet, what is examined by this research, is that the proposal effectively enables an agile project management approach in projects through contracting.

Lawyers should understand agile project management

This thesis – and with that, the contractual proposal – is written from the viewpoint of project management. It is up to lawyers and legal professionals to translate these recommendations into real contract clauses. The structural and legal aspects of agile contracts are not different from contracts for conventional project management. The real difference is the understanding of the agile approach and the agile processes. Hence, it is important that contract lawyers understand agile.

Comparison between different industries

A lot of ideas for the agile contractual proposal are rooted in IT industry. As already known for many years, it is hard to transfer policies between different industries (Dolowitz & Marsh, 1996). Context of an industry is very important. This is the reason why these IT agreements are not just 'copy-pasted' to construction contracts. In this research, the context of the construction industry is mainly considered by taking the DNR 2011 as a basis for construction contracting. Also, interviews and a literature study concerning the construction industry were conducted. However, it is necessary to test the research findings in an actual agile construction project.

Different viewpoints - client and supplier

A contract is an agreement between two (or more) parties. Therefore, at least two viewpoints need to be considered: client and supplier. Both viewpoints were taken into account during this research. The *Proposal for an Agile Contract* was also validated by both parties. In general, both parties responded positively. However, as described in the conclusion of the validation, the following concerns arose from both viewpoints:

- *Client*
Clients indicated that the proposed 'intensity of involvement' (the contractual aspect 'organizational') was worrying them, particularly the intensity in terms of client involvement and being part of the development team.
- *Supplier*
The supplier foresaw problems in the co-located teams that must work simultaneously. This is because projects require different disciplines. In general – at this time – all project participants (architects, engineers, consultants) are working on multiple projects. This causes logistical problems when it is required to work together at the same time and the same location.

These concerns could also be an indication that the interviewee or organization of the interviewee is not ready yet for agile project management. A mind shift and cultural change (a 'paradigm shift') is needed to get acquainted to the agile methodology. Since the proposal follows the agile methodology, truly agile organizations should not 'fear' recommendations from the *Proposal for an Agile Contract*.

6.2.2 Research limitations

With regards to this research, several limitations must be taken into consideration. The limitations affected the *internal* or *external validity* of this research. *Internal validity* is referred to as the quality and accuracy of the findings, and *external validity* to the generalizability of the findings to another context.

Limitations of the data and analysis (internal validity)

- Plenty of literature is available concerning agile- and conventional project management in general. However, limited studies are existing of agile project management in relation to the construction industry. Also, the literature study on agile contracting in the IT industry shows some limitations: no shared viewpoint toward agile contracting was found. Consequently, the answers to sub-research question two and three are bound to some constraints.
- Interviews and questionnaires showed that there is *grey area* between agile- and conventional project managers. During some interviews, most of the time was spent on discussing agile in construction rather than agile contracting. Most people do know principles or values, but someone should know the practice to discuss the contractual proposal on an appropriate level.
Therefore, from nine interviews performed only six are used in this research: two interviewees are written down as transcript per target group. As a result, outcomes of interviews give an indication of the value of an agile contract but lack the depth to draw firm conclusions.
- All data from the interviews are compared in a table, as is shown in appendix G.8. From this table, results are derived for the conclusion of the validation. However, this method still leaves room for some subjectivity.

Limitations of the data and analysis (external validity)

- Interviewed project managers were all employees of Arup Amsterdam, which results in the probability of bias in which participants do not truly reflect the population of interest (Visser, Krosnick, & Lavrakas, 2000). Consequently, generalizability of these results could be difficult.

6.3 Recommendations

In this chapter recommendations that came forward out of this research will be discussed. First recommendations for *implementation and use of the research findings* will be discussed, followed by *recommendations for future research*.

Recommendations for implementation and use of this research

For the implementation and use of this research an additional booklet is made: *'Proposal for an Agile Contract'*. This booklet entails recommendations to implement the findings of this research.

Concerning this proposal, two additional notes are made:

- If one (or both) parties do not agree with certain recommendations of the proposal, it should be investigated if that specific organization or project is suitable for agile project management. First an organization must truly believe and understand agile, before working agile – and thus applying an agile contract.
- Before this contractual proposal can be used in practice, it should be transformed in legal articles and clauses. The proposal gives recommendations per article of the DNR 2011.

Recommendations for future research

Since no proposal for an agile construction contract existed, this study can be a basis for future research. During this research the following opportunities for future research came forward:

- *Test the 'Proposal for an Agile Contract' in practice*
To further test this agile contractual proposal, it should be applied in real projects. This should not be in projects operating in the 'grey area' of conventional- and agile project management, but in 'fully agile' projects. This could improve the validation of this research.
- *Investigate roles and responsibilities of each team member in an agile project*
It appeared that sometimes the exact roles in an agile organization are more 'blurred' than with conventional project management. If these roles are clearer this can also be a part of the contract or used during the project kick-off to set expectations. That said, it must be considered that agile emphasizes *self-organizational teams*.
- *Design a model to measure 'agility'*
The term agile is often misused because it is a popular term. Right now, it is hard to check the agility of a project. Therefore it is recommended, to design a model that helps to decide whether a project (or organization) is considered agile or conventional. In this research, it appeared that there was often a blurred line between agile- and conventional project management in practice. A research could be conducted to make this line more clear or measurable.
- *Design a tool to measure if a (construction) project is fit for agile*
In addition to the previous point: design a tool (like a decision tree) to test if a project or organization in the construction industry is fit for agile project management.
- *Tailor the 'Standaardtaakbeschrijving - DNR-STB 2014' (Standard Task Description) to agile project management*
To have a complete agile DNR 2011 it is also proposed to tailor the *'standard task description'*. This is not done in this research and would help the applicability of agile project management in practice.

- *Investigate applicability of agile project management in the construction industry*
More research is needed on the applicability of agile project management in construction industry (throughout all phases of a project).
- *Research toward other agile (execution) contracts*
Investigate agile project management in perspective to other kind of contracts in the construction industry. For example, integrated contracts like: Design Build Maintain and Finance (DBMF) contracts.
- *Research towards agile tendering*
The tender procedure and contract award procedure was out of the scope of this research. However, this can be a concern when using agile project management. Request for proposals (RFP's) or tender procedures should be flexible enough to accommodate agile project management. This needs further research.
- *Research towards intellectual property (IP) rights in an agile contract*
More research is needed about intellectual property (IP) rights in agile contracts. This aspect gave a lot of discussion during the validation of this research.

6.4 Reflection

Prof. Hans Bakker, the chairperson of my committee, asked me to write a ‘personal reflection’. I was pleased to do this, because I ‘reflected’ many times while I was working on my thesis.

A few suggestions for those who are in the process of starting this challenging adventure:

Try as soon as you can to interview the experts and talk to people in the field.

I was fortunate to conduct my research at Arup. This gave me the opportunity to talk to people ‘in the field of project management and contracting’ in an informal manner, during lunch or just while drinking coffee. This helped me a lot, especially in the beginning of my research. It gave me a proper view of the context of my thesis.

However, in the beginning I was quite insecure about my knowledge of project management and contracting. I found it hard to find the right balance between reading literature and asking for help from experts. You don’t want to look foolish and waste someone’s time, isn’t it?

But then again, talking to people helps a lot to find the answers you are looking for. Due to the overwhelming amount of literature, you sometimes experience the annoying feeling: “*Door de bomen het bos niet meer zien*” – “*Cannot see the wood for the trees*”.

That said, it is also hard to schedule interviews with experts, and – above all – find the appropriate experts of agile project management in the construction industry. That is another reason why it is a recommendation to schedule interviews early in the process of writing.

Structure the research set up iteratively.

I started to structure my thesis straight from the beginning: research design, hypotheses and chapters set-up. This was helpful, because by doing so I could fill in the blanks.

Admittedly, I sometimes didn’t want to ‘let go’ the original structure, because I was afraid that I would lose track (those *infamous trees*...). But, as agile dictates: be flexible and make decisions when more information is available.

In the end, during the last couple of weeks I changed my research structure repeatedly. This helped me a lot, but I could have done this earlier.

Get other people to read your draft.

I found it hard to write my thoughts clearly on paper. I often walked around Arups’ building to ponder about how to write everything down.

Many times it happened that it all seemed well-defined in my head, but it turned out different on paper. Finally, it helped a lot to let other people read certain sections of this thesis and get their intelligent feedback. Thanks for that.

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A. The New Rules 2011

A.1 List relevant articles in perspective to agile

Table 1. Relevant articles in perspective to agile project management of The New Rules 2011 (BNA, Royal Institute of Dutch Architects; NL ingenieurs, 2011, pp. 11-37).

The New Rules 2011		
Chapter and article	Clause and sub-clause	Topic in perspective to agile
Chapter 1	Definitions	Amplify with agile definitions
Chapter 2	General provisions with respect to the commission	
Article 2	3	
The commission	Prior to the coming about of the commission, parties shall confer, as far as possible at that moment and as far as relevant, about:	
	3a	
	the content and scope of the activities to be carried out by the consultant;	Scope
	3d	
	the timetable within which the consultant will have to carry out (parts of) the commission;	Schedule
	3e	
	the eventual phasing of the execution of the commission;	Schedule
	3g	
	the designation of a natural person who will represent the client with respect to the commission;	Organizational
	3i	
	the way in which quality assurance will eventually be organized;	Scope (prioritization of features)
	3k	
	the way in which the consultancy costs of the consultant will be determined and which part thereof will be allocated to separate stages and a payment schedule;	Financial
	3l	
	an estimate of the consultancy costs split up according to the different stages;	Financial
	3m	
	Whether, and if so in which way, rate alterations and indexations with respect to the consultancy costs will be applied;	Financial
	3n	
	The nature and scope of expenses;	Financial
	3o	
	the manner in which, and if necessary in what frequency, the transfer of information and consultation between the consultant and the client as well as between the consultant and third-party-consultants will take place;	Communication
	3p	
	the form and the number in which documents will be delivered to the client and eventual third parties and under which conditions this will take place;	Communication
	3t	
	the manner in which they will handle with respect to subjects which at the time of the coming about of the commission could not yet be settled.	
Article 3	1	
Preliminary investigation	The consultant advises the client to commission him with carrying out a preliminary investigation:	
	1a	
	if the client cannot provide a brief which can act as a sufficient point of departure for the consultant to start his activities;	Scope

Chapter 3	Special provisions with respect to the commission	No change
Chapter 4	Adjustments	
Article 9	1. Parties consult with each other with respect to an adjustment of the commission	Scope
Adjustments to the commission	if:	
	1a alterations arise in the points of departure or other circumstance which underlie the commission;	Scope
	1b if it is not clear enough for the consultant whether the fulfilment of the commission is possible, also with regard to the provisions of article 2, clauses 1 up to and including 3;	Scope and communication
	2 If the client goes along with the advice to carry out a preliminary investigation, then the consultant draws up in consultation with the client a written concept of the commission for a preliminary investigation, in which the provisions of article 2 are applied in a similar way	Scope
	3 If the client does not go along with advice to carry out a preliminary investigation, then the parties will enter in consultation with each other. In this consultation the parties will observe each other's legitimate interests.	
Chapter 5	Obligations of the parties	
Article 11	5 The consultant keeps the client informed about the execution of the commission. The consultant provides to the best of his capacity and in time, on request, all pieces of information, including information about the progress of the execution of the commission, alterations of legislation, or alterations with respect to the financial aspects of the commission, the financial consequences of alterations thereof whether necessary or not, as well as information about agreements which the consultant has concluded with third parties for the fulfilment of the commission.	Communication
General obligations of the consultant	6 The commission is carried out according to the agreed time schedule. Unless otherwise explicitly agreed between parties, the terms in the agreed time schedule are not fatal terms.	Schedule
	7 The consultant only starts with a next stage after the client has granted him permission to do so in writing. In this permission the approval of activities executed in the former stages is deemed to be included, except for parts of the activities for which the client has explicitly withheld his approval.	Sprints
Article 12	2 The client is responsible for the timely supply as well as the correctness of the information, data and decisions, necessary for the proper fulfilment of the commission, as delivered by him or on his behalf to the consultant. The client indemnifies the consultant against claims by third parties with respect to these pieces of information, data and decisions.	Communication
General obligations of the consultant	3 The client shall evaluate on time the documents which the consultant prepares in the course of fulfilling the commission, and if so requested authenticate them after approval.	Communication
	4 The client has an obligation to warn the consultant in due time if he has actually noticed a shortcoming in the advices of the consultant or should have been aware of such a shortcoming.	Communication
Chapter 6	Liability of the consultant	
Article 13	1 The consultant is liable towards the client for his culpable fault. Insofar as compliance is not already permanently impossible, this clause is only applicable while taking into consideration the legal regulations with respect to neglect by the debtor.	Liability
Liability of the consultant for culpable shortcomings		

	2	If the consultant makes use of another person in the fulfilment of the commission, then the consultant is likewise liable as for his own shortcomings, taking into consideration the provisions of article 4 clause 5.	Liability
Article 14		Compensation is out of the scope of this research.	Out of scope
Chapter 7		Delay, interruption and the consequences thereof	Out of scope
Chapter 8		Provisions applicable to cancelation of the commission	Termination of the project
Chapter 9		Cancellation of the commission	Termination of the project
Chapter 10		Consequences of the cancellation of the commission	Termination of the project
Chapter 11		Ownership and use of rights on documents of the consultant with respect to the advice	
Article 46	1	The consultant, or his assignee(s), has the exclusive right of publication, realization and multiplication of his designs, drawings, sketches, photographs and all other representations of his design, of his models as well as all other objects or information carriers, which give a picture or representation of his design, or which are referred to in the Copyright Act 1912 or in the Benelux Convention with respect to the intellectual property of trademarks, drawings and models.	Ownership
Rights of the consultant on the advice			
Article 48	1	The consultant has the right to repeat his advice, insofar as this does not conflict with reasonable interests of a former client and only after the consultant has consulted with the former client.	Ownership
Right of repetition of the advice			
	2	The client is not allowed to use the advice, whether completely or partially, once again without the explicit written permission of the consultant.	
	3	In the case of a complete or partial reuse of the advice by the client, the parties shall agree on the remuneration in mutual consultation, taking into account the compensation for the rights on the advice to which the consultant is entitled.	
Chapter 12		Financial provisions	
Article 51	1	The fee as desired by the parties is determined in writing prior to the coming about of the commission in one of the following ways or a combination thereof:	Financial
Determination of the consultancy cost			
		1a as a percentage of the execution costs; 1c as a fixed sum agreed upon between the parties;	
		1b on the basis of the time spent on the fulfilment of the commission;	
		1c as a fixed sum agreed upon between the parties;	
		1d according to any other criterion agreed upon between the parties.	
Article 55	1	The client is indebted separate consultancy costs for alterations which the consultant has to carry out, insofar as these are not the consequence of a culpable shortcoming by the consultant.	Scope
Consultancy cost in the case of adjustments and alterations			
	3	If alterations occur in relation to the coming about of the commission as mentioned in article 9 and article 20, leading to a change in the activities of the consultant, then the consultancy costs will be revised in mutual consultation	Scope
Chapter 13		Applicable law, disputes and enactment	No changes

A.2 Articles of the DNR 2011 in perspective to agile

Chapter 2 - General provisions with respect to the commission

Article 2 – The commission

Article 2 clause 3 stipulates subjects on which consultation has to take place between both parties about the commission. Before an agreement is in place, both parties must agree upon the project specific agreements. Article 2 is meant for certain provisions that cannot be captured in a standard provision. Article 2 clause 3 gives guidance for these subjects to which both parties should pay attention. It is an enumeration of different subjects which are, in many commissions, after consultation agreed upon. However, this does not mean this list is complete or should be entirely included. Other project specific agreements also can be included.

Article 2 clause 3 sub a state which activities will be carried out by the consultant. With agile the client and consultant relation is very tight. This *co-creation* mentality can cause certain activities to have overlap between client and consultant. Therefore, it is good to examine how to address this clause with respect to the commission.

Article 2 clause 3 sub d and e are both about the time scheme of the project. Sub a is about the schedule and timetable and sub b about the phasing. The schedule and especially phasing of a project when using agile can differ quite a lot from conventional project management. This is because a project will be split up in *product features*¹ which will be prioritized constantly. This implies that the schedule is a 'living document'. These product features are accommodated in *sprints*, this can be of interest for sub e, which lays down the phasing of the project.

Article 2 clause 3 sub g is about a natural person who will represent the client during the project. It goes without saying this is only needed when the client is a corporation. When working with agile, it is very important the client is involved very intensively and on a daily basis. For example with *AgilePM* this is called the business ambassador and he is involved in the daily decision making. This implies this must be a person who is trusted by the client and is empowered to make decisions.

Article 2 clause 3 sub i lays down how quality, with respect to consultancy work, will be assured. With agile the work will be done in intensive collaboration with the client. The prioritization of project deliverables is one of the agile methods to assure quality. This requires close communication and collaboration of the client.

Article 2 clause 3 sub k, l, m and n are clauses about the financial provisions. The consultancy fee is one of the essentials of an agreement. These clauses must describe the way in which the consultancy cost will be determined; how it can be split up over different stages, how should alterations be applied and the nature and scope of expenses. With agile these phases may be sprints and alterations will happen often. Considering this, and since from the literature and the exploratory interviews the financial provisions appeared to be an import part of the agreement, it is needed to investigate this further in relation to agile project management.

Article 2 clause 3 sub o stipulate the way in which the transfer of information and consultation between the parties will take place. This may also describe the possible establishing of a design team in which consultants or even contractors can take place. To have this all in place is an extremely important aspect of agile project management. This differs quite a bit from conventional project management and therefore must be examined further.

¹ *Product features, sprints, AgilePM* and other agile terminologies are explained in §5.2 of this thesis.

Article 2 clause 3 sub p is a sub-clause with respect to the form and the number in which documents will be delivered. This has to do with documentation and communication. Since agile preaches informal communication and “*working software (or products) over full documentation*” this sub-clause should be studied as well.

Article 2 clause 3 sub t is a sub-clause regarding issues which are not fixed when entering into the contract. The *standard form of basic contract explanatory notes*² on the DNR 2011 assumes parties will lay down these issues and will discuss these points during the project (Royal Institute of Dutch Architects & NLingenieurs, p. 20 article 10 clause 3).

Considering that, while using agile, the scope is often still not described in detail and the agile principle of *respond at the last responsible moment* this is an important sub-clause to study.

Article 3 – Preliminary investigation

Article 3 clause 1 describes three situations in which the consultant must advise a preliminary investigation. The first (sub a) is if the client cannot provide a clearly defined program of requirements. Since this program of requirements in agile must be defined together with the consultant and can change during the project, this clause should be investigated.

Chapter 4 – Adjustments and alterations

Article 9 – Adjustment to the commission

After the agreement comes into being there can be various reasons that the parties want to adjust the agreement.

Article 9 clause 1 is given circumstances which can lead to consultation between parties with respect to an adjustment of the commission.

Article 9 clause 2 gives examples of circumstances that give cause for an adjustment of the commission. It lays down that these alterations must have some weight.

Article 9 clause 3 states that it is possible that change can lead to a decrease or an increase of the consultancy costs. It defines that if a change is agreed upon, this should be done in writing considering article 4 of the DNR 2011.

Since the fourth value in the agile manifesto says: “*responding to change over following a plan*” it is important to look at these three clauses of article 9. Agile sees change as an opportunity to add value, instead of resisting change. In agile projects change is more a rule than an exception.

Chapter 5 – General obligations of the parties

This chapter stipulates the different obligations of the consultant (article 11) and client (article 12).

Article 11 – General obligation of the consultant

Article 11 describes the obligations of the consultants. Clauses 5, 6 and 7 are of interest for agile project management.

To begin with article 11 clause 5, this clause defines that the consultant is obliged to inform the client about the progress of the execution of the work. This is because the client depends to a large extent on the consultant. The information can be about the general progress of the work, change in regulations, change in financial aspects, or financial consequences of certain decisions. The

² Dutch: Model-basisopdracht (MBO)

consultant should take initiative to inform and to the best of his knowledge. Considering the informal communication of agile, it should be investigated how this should be agreed.

Article 11 clause 6 stipulates the time schedule in which the commission should be fulfilled. This is not meant as a fatal time schedule. When the client is not satisfied, he should first declare in writing that the consultant is in default and should give a reasonable time to amend this default. Time is seen as a very valuable aspect of agile. A lot of agile tools such as AgilePM fixes the time, however this is done by making the scope flexible. This should be considered when working agile.

Article 11 clause 7 is about the phasing of the commission. Traditionally the commission will be asked to be delivered in phases. This way the client can check each phase. After the client has approved, the consultant can continue to the next phase. This is an interesting clause to investigate since with agile a commission is split up in different sprints.

Article 12 – General obligations of the client

This article is the complement of article 11. It stipulate the obligations of the client towards the consultant. We will discuss clause 2, 3 and 4, as these need attention in the context of agile project management.

Article 12 clause 2 and 3 lay down the obligations of the client to provide the timely and correctness of information, data and decision. This is necessary for a good fulfilment of the commission. As Ubink and Oldengarm (2012, p. 56) describe this can be the determination of the *program of requirements*. Since the client involvement is of great importance with agile, it is important to pay attention to this clause. The client must be available on a daily basis and must regular assist on the prioritization of the requirement (e.g. *product backlog*).

However this is not only limited to the definition of the requirements. It can be seen as a broad clause as some of the pronunciations of the '*Commissie van Geschillen (CvG)*'³ show. In 2009 there was a conflict about additional work because the consultant had to map much more cables and piping than estimated before together with the client⁴. The client did not provide all the information regarding this commission and this caused the consultant made a wrong estimation. The CvG decided that the client should compensate the consultant for the additional work.

On the other hand the consultant cannot always blindly trust on the information given by the client (article 11 clause 10). Just as the consultant has warning obligation towards the client, article 12 clause 4 stipulates that the client has an obligation to warn the consultant, if he actually noticed a shortcoming in the advice or should be aware of such.

All these obligations can be seen as regulations to stimulate cooperation. This makes it very interesting in relation to agile project management. It should be investigated how to involve the agile collaboration principles in these articles and clauses.

Chapter 6 – Liability of the consultant

Chapter 6 deals with liability, and liability for compensation in case of deficiencies. Article 13 stipulates the liability, article 14 to 18 governs the compensation. For this thesis mainly article 13 is of interest. This is because the solution or product is developed in close co-creation with the client. The compensation should not necessary change when working with agile project management instead of conventional project management.

⁴ CvG, 3 February 2009, nr. 416/582

Article 13 – Liability of the consultant for culpable shortcoming

This article deals with the liability of the consultant in case of deficiencies. Following article 13 clause 1 the consultant is not by definition liable for the consequences of a shortcoming. First the client should serve a proof of default in writing to the consultant. And insofar performance is not already impossible. The jurisprudence has multiple examples⁵ of possible liabilities due to deficiencies from consultants.

Since the collaboration with agile project management is very close, it is important to give this article attention. As article 13 clause 2 expresses the consultant is also liable if he makes use of another person in the fulfilment of the commission. However, if this other person is the client it must be investigated how to cope with this.

Chapter 8 – Provisions applicable to cancellation of the commission | Chapter 9 – Cancellation of the commission | Chapter 10 – Consequences of the cancellation of the commission

Chapter 8, 9 and 10 are about the cancellation of the commission. Chapter 8 describes the provisions applicable to cancellation of the commission, such as the mode of cancellation. And obligations of parties after the cancellation. Chapter 9 defines reasons for the cancellation and chapter 10 the consequences. We will not go deep into the articles; however, it is important to mention that it is in the interest of an agile way of working to make cancellation possible in a good manner. The literature discusses that this improves the flexibility and that it must be possible to cancel the commission if enough customer value is accomplished or if after one sprint the collaboration does not meet the expectations (Opelt, Gloger, Pfarl, & Mittermayr, 2013; Sutherland J. , Agile Contracts: Money for Nothing and Your Change for Free, 2008).

Chapter 11 – Ownership and use of rights on documents of the consultant with respect to the advice

Article 45 – Ownership of documents

Article 45 deals with the ownership of the documents which are produced by the consultant and the use of rights of these documents. This ownership can only bears on physical documents. This right of ownership is different from the copyright, which the consultant has on the advice that he gives, which is laid down in article 46 (Ubink & Oldengarm, 2012, p. 177).

Article 46 – Rights of the consultant on the advice

Article 46 clause 1 lays down that the consultant has the exclusive right of publication, realization and multiplications of all his representation of his design. Article 46, clauses 2 to 4 underline this. These different right follows from the Copyright Act 1912⁶ as well the Patent law⁷ and the Benelux Convention⁸ with respect to intellectual property.

With agile project management it is intention to work very close together. This may be ground for discussion who is the owner of parts of the design.

Article 48 – Rights of repetition of the advice

⁵ CvG, 27 June 2007, nr416/601, is an example of a project management conflict regarding liability of the consultant.

⁶ *Copyright* is the exclusive right of the author of a literary, scientific or artistic work or his successors in title to communicate that work to the public and to reproduce it, subject to the limitations laid down by law.

⁷ A *patent* is a set of exclusive rights granted by a sovereign state to an inventor or assignee for a limited period of time in exchange for detailed public disclosure of an invention.

⁸ *The Benelux Office for Intellectual Property* (BOIP) is the registration office for trademarks and designs in the Benelux.

The discussion about who is the owner of the documents also applies on article 48 clause 1, 2 and 3. In clause 3. A compensation must be agreed upon the right of compensation.

Chapter 12 – Financial provisions

The financial provisions are kept quite general in chapter 12. This is because the DNR 2011 is meant for consultancy activities from a wide range of professional disciplines. Even though, payment and award methods are important elements of a contract. Therefore, it should be examined how this should be encountered with agile project management.

Article 51 - Determination of the consultancy cost

Article 51 clause 1 sub a, b, c, and d describes different methods of how the consultancy costs can be determined. Cost can be determined in one sole manner for all parts, or over different stages using different calculation methods. Hence multiple variations are possible to determine these cost. It has to be investigated how to approach this aspect for agile project management.

Article 55 – Consultancy costs in the case of adjustments and alterations

Article 55 is important to recon since agile is known for 'embracing change'. It has to be determined how to cope with change in relation to the payment and award system for the consultant. This must be no hassle, otherwise it will undermine the flexibility principle of agile.

B. Agile IT Contracts

B.1 'Best practices' from Agile IT Contracts

This section goes into the best practices of different agile contracts per contractual aspects. Because the current agile IT contracting literature does not always give a shared view, underneath each aspect the different standpoints are discussed.

Pre-conditions of a contract

1. Relationships between contracting parties

The agile value of *'customer collaboration over contract negotiation'* cannot be ignored when discussing agile contracting. Or as Arbogast et al. marks in the *Agile Contracts Primer: "Successful projects are not ultimately born from contracts, but from relationships based on collaboration, transparency, and trust"* (2012, p. 4).

All authors agree that an agile contract should reflect this principle. A certain amount of mutual trust is imperative in order to be able to agree. The contract should contain mechanisms that support collaboration, transparency and trust. However, none describe a tangible tool to reach this.

2. Commitment to Agile

The *Agile Project Management Handbook V2* (DSDM Consortium, 2015, p. 206) outlines the importance of first checking the pre-commitment of agile, then decide to continue. If the development team does not understand nor accept the principles of agile project management it is not worthwhile to pursue the project. The bullets below describe a different approach:

- DSDM⁹ developed a Project Approach Questionnaire (PAQ) to measure *'agile commitment'* of teams (DSDM Consortium, 2015, p. 205). This questionnaire contains 17 statements that practitioners can agree or disagree to. The DSDM approach requires each project team member to fill in this questionnaire before the project starts. Only if this is done successfully, the project can begin (including signing the contract).
- Opelt et al. (2013, p. 9) state: *"Emphasize the motivational and cooperative approach of agile project management."* This also means that if the team is not motivated or not willing to cooperate with each other, it does not make sense to continue the project in an agile way. Opelt et al. does not describe exactly how to do this in the pre-contractual phase. However, he does explain how parties should act during an agile project, this can be found underneath the aspect *'obligations of both parties'*.
- Hoda et al. (2009, p. 188) utters to focus mostly on the client mind-set; the client often lacks an agile mind-set. Because clients are used to *'fixed everything'* contracts, it is hard to change their way of thinking to suit agile contracting. Agile practitioners should make an effort to change this and encourage the client to look beyond the constraints of a contract. Hoda et al., again, do not describe how to do this.

⁹ Reminder: DSDM stands for Dynamic Systems Development Method. The DSDM Consortium is the author of AgilePM, which is a tool for agile project management.

Agile IT contracts per aspect

1. Commission and scope description

All studied literature emphasizes the importance of flexibility to allow scope changes. Scope changes in the front-end development of projects often have less impact on the cost and time than in later phases. This is already shown in figure 2.2 on page 14.

Most agile IT contracts accentuate *functional descriptions* in the form of *product features* and the possibility of *scope substitutions*. But the ideal agile contract would allow to drop the functionality that the client wants, to get a solution that actually fits the business needs. The bullets below will describe the different approaches.

- The SAFe¹⁰ contract describes the shared responsibility of the client and supplier to establish *initial vision and roadmap*¹¹ and to define the *initial fixed* and *variable solution intent* (SAFe, 2016). This is followed by the initial prioritization of the backlog. The client and supplier do this together. Afterwards both decide if they want to continue the project. It depends on the project and the technical depth of this phase if the client should compensate the supplier for this. The client can also do this with multiple suppliers and may decide to award the supplier after this phase. This way, before starting the real project, already some kind of trust and relationship is build.

SAFe advocated to replace the '*statements of work*' with '*statements of target outcome*' (SOTO). SOTO's work the same way. But instead of work in the form of specifications and activities, the outcomes that are achieved are measured.

During the project, this outcome should be evaluated after each *sprint/increment*¹². Thereafter, the client can decide to keep funding steady ahead, or increase or decrease the funding – or even begin to wind down, based on whether sufficient value has or has not been achieved (SAFe, 2016). This must result in an adaptive, outcome-based contract.

- Opelt et al. (2013) call for defining the *vision* and *backlog* in the contract. The vision should be known by all parties. Each project needs a vision that describes the business needs: "*The project vision forces the client to find the real value behind why this project is performed but also where intentional constraints are set*" (Opelt, Gloger, Pfarl, & Mittermayr, 2013, p. 92).

An example of how this vision and backlog should look like in an agile IT contract is shown in appendix B.2. The detailed individual backlog items are described during the project. This way the detailed specification is distributed over the project phases and therefore written when more information about the project is available.

Another key aspect of Opelt's proposed '*Agile Fixed Contract*' is that the client can change requirements within the same high-level scope. This means that new things can be added, as long as other things are removed from the backlog. This is very similar to Jeff Sutherlands '*Change for Free*'¹³ principle. The book *Agile Contracts* also contains an appendix to govern these scope and change processes (Opelt, Gloger, Pfarl, & Mittermayr, 2013, pp. 92-101).

- The DSDM¹⁴ consortium, author of AgilePM¹⁵, has designed an agile IT contract tailored to the AgilePM approach (DSDM Consortium, 2015). This contract does not have a detailed up-front scope specification: the scope is formulated during the project.

¹⁰ SAFe (Scaled Agile Framework) is an agile tool designed by Scaled Agile, Inc.

¹¹ With a *roadmap* is meant a plan or an action for how a product or solution evolves over time.

¹² With Scrum an *increment* (AgilePM) is called a *sprint*.

¹³ *Change for Free* means that product features can be exchanged, as long the time and cost stay the same.

¹⁴ Reminder: DSDM stands for *Dynamic Systems Development Method*. The DSDM Consortium is the author of AgilePM, which is a tool for agile project management.

¹⁵ Reminder: *AgilePM* is formally known as DSDM Altern and developed by the DSDM consortium.

For each phase the contract defines a set of products that have to be delivered. The first phase is the feasibility study, followed by the business study. The purpose of these studies is to define the scope of work (*Prioritised Requirement List, PRL*), plan of execution (*architecture definition and outline prototyping plan*) and test if the project is feasible. This means the scope is developed during the first phases of the project and more details are added along the way. This can be seen as the purpose of the front-end development phase.

Clause 2.3 to 2.6 in the DSDM contract describe how to facilitate change. Clause 2.3 stipulates that both parties should agree on a protocol that describes the requirements for change. Where there is no such protocol, clause 2.4 to 2.6 apply. These clauses mainly state that changes are legitimate if it is documented in writing (such as by meeting minutes or keeping an updated list of requirements resulting from agile workshops, or any other form of record), but only where that written document has been agreed upon by all parties.

- Arbogast et al. (2012, p. 20) suggest in their '*Agile Contracts Primer*' to write a project vision statement. All involved parties should participate in writing this project vision, this can be done in a workshop. In this workshop, Arbogast et al. advice to decide on the contract form and price and payment method (e.g. target cost contract).
In their proposal for an agile scope two things stand out: (1) there should be no extensive change management procedures. (2) Both parties should decide on the acceptance criteria, also sometimes referred to as the *Minimum Viable Subset (MVS)* or *Minimum Viable Product*¹⁶ (MVP). This should be agreed upon before the start of each sprint.
- The Norwegian *PS2000 Agile IT contract* mainly focuses on the principle that the parties agree on the content of the *product backlog*, the *sprints* and the *acceptance criteria*. The scope should entails a prioritized product backlog and updated time estimates. Changes can easily be made. Small changes do not need any additional process and big changes must be agreed upon in the steering group of the project (Den Norske Dataforening, 2016). The contract does however not explain when a change is small or big.

2. Financial provisions

A large number of financial models is suggested for agile projects. The bullets below show a selection.

Variations of fixed price contracts:

- The SAFe model describes a '*fixed price with shared gain/pain*' (SAFe, 2016). This is similar to the *target cost contracts* that is described in the '*Agile Contracts Primer*' (Arbogast, Larman, & Vodde, 2012, pp. 28,36). A target cost contract can be seen as a hybrid shared pain/gain model. In this model the client and the supplier are sharing the pain or gain when a project takes more or less effort than original estimated.
- An alternative fixed price model is the '*fixed price range – not yet contractually binding*' model (Book, Gruhn, & Striemer, 2012). The parties together define their common assumptions in terms of the business value, implementation risks, effort and costs. Next the test phase begins, in this '*check-out phase*' both parties compare the results with their initial assumptions. Together they decide the implementation and the conditions of the way the project continues. Again, both parties share risk: they divide the additional expenses for unexpected changes.

¹⁶ The Minimum Viable Product (MVP) is a product with just enough features to gather validated learning about the product and its continued development

- The last fixed price method is to agree on the fixed price for the *Minimum Viable Product (MVP)*. This means the supplier *at least* delivers the MVP for a certain fixed price. In the best case the supplier delivers more than the MVP, however the supplier can never deliver less than the MVP. After the MVP is created, both parties can consider to extend the collaboration. This can also help to build trust between parties.

Variations of reimbursable contracts:

- SAFe expounds that a *traditional reimbursable contract* can work well in an agile environment. But there must be enough trust of both parties (SAFe, 2016). This is basically the same as in a traditional environment.
- *Capped Time & Material (T&M)* contracts work similar as traditional T&M contracts. However, there is an upper limit of the amount that customers have to pay. In this way, suppliers will benefit to deliver as effective as possible while customers only have to pay up until the capped cost limit is reached.
- Thorup and Jensen (2009) split up the price in *price per hour and completions price*. The '*Collaborative Agile IT Contract*' tries to find the optimal combination of an hourly price and a time independent bonus. For example, 80% of the total price is reimbursable and 20% is given if milestones are completed. Based on these estimates of the total price can be given.

Payment per deliverable:

- Zijdemans and Stettina (2014, p. 85) suggest a *payment per sprint/increment*. They also see this as a solution for early termination. However, from the suppliers' perspective, this does not cover the risk of relocating the resources on the project.

3. Obligations of the parties, in terms of organizational structure, general obligations and decision making

It is important that all parties commit to the agile principles of project management. Arbogast et al (2012, p. 4) describe in the *Agile Contracts Primer*: "*The key difference is the approach to an understanding of operational process and delivery and how this is captured in or intersect with contracts.*" It is important that all parties commit to the agile principles of project management. Roles and responsibilities must be well-defined in the contract, just as in a traditional contract. However, the obligations of both parties, in terms of organizational structure and communication is very different in an agile project relative to a conventional project.

- Opelt et al. (2013) recommend to describe the project approach in the contract. It should contain obligations of both parties to co-operate with agile project management. Opelt et al. calls this: "*a code of cooperation for optimal collaboration in the project*". This is described in 12 principles of cooperation (Opelt, Gloger, Pfarl, & Mittermayr, 2013, pp. 101-107). For each principle Opelt describes how to behave as a client and supplier.
 - To give an example, principle six is: "*face to face communication*":
 - Behaviour of the client: "*Understanding that good documents only result from successful face-to-face communication.*"
 - Behaviour of the supplier: "*Communicate openly with the client. All information, including any problems due to limitation is visible to the customer. We do not hide anything.*"
 - Behaviour of the team: "*Talk to the customer and/or end user. Understand their needs.*"

- The PS2000 Agile IT contract focusses on the agile tool Scrum. The original contract is adjusted on that specific methodology. The main differences in the PS2000 Agile IT contract with the traditional IT contracts are (Den Norske Dataforening, 2016):
 - Throughout the contract more guiding text is included: there is a special annex according to agile methods. The whole scrum-process is documented in the contract.
 - All the roles in the project are described in the context of Scrum (i.g. Product Owner, Scrum Master and the Development Team).
 - Especially the clients' duties are extended. This is mainly concerning the responsibility for the *product backlog*.
 - Under status reporting the *Burndown-charts* are proposed as a tool to keep track of the project.
 - The stages of a project are directly documented in line with Scrum: *sprints*.
- The law firm Bird&Bird (2016) proposes a model where the key roles within the Scrum model are explained: the Product Owner, the Development Team and the ScrumMaster. These key roles and responsibilities are elaborated from the viewpoint of client and supplier. Bird&Bird has not made a complete contract, but made a paper with various recommendations. Suggestions are for example: *"The Product Owner is a representative of the Customer and as such, the contract should provide for the Product Owner to be nominated and appointed by the Customer..."* *"... the contract set out the key responsibilities of the Product Owner, including: Initial development and prioritization of the Product Backlog; ongoing revision and re-prioritization of the Product Backlog as the project develops; and, participation, on behalf of the Customer, in the relevant Scrum planning and review meetings."*
- The DSDM (AgilePM) contract advocates to follow the AgilePM tool strictly. This way all the roles and responsibilities should be clear. The contract stipulates in clause 1.4: *"The project will be run according to DSDM. The parties are at liberty to agree variations to DSDM, and all such agreements between the parties shall be binding according to terms of such agreement. All such agreements shall be interpreted in the light of DSDM and the techniques called for by DSDM but otherwise will be subject to this contract and must be interpreted in accordance with its terms."* The next clauses go deeper in the DSDM approach, and describes all the AgilePM processes. The DSDM handbook, which explains the tool AgilePM, is sometimes even used as a reference in the contract.
- Thorup and Jensen (2009) take this DSDM contract approach even further. Thorup and Jensen suggest to emphasize the whole process, organizational scheme and key roles in the contract. The development process is exemplified as: weekly iterations with requirements, estimation, prioritization, development, delivery, testing, and feedback. This is explained in very much detail, to give an example, the process of iterations is written down as follows (the contract is between 'BestBrains' and 'The Energy Corporation'): *"The transition from one iteration to the next follows this plan: Wednesday evening BestBrains delivers software to The Energy Corporation's development environment. Thursday morning, The Energy Corporation tests the new software focusing on new functionality and provides BestBrains with quick feedback on any defects, so that tasks from the ending iteration can be closed. The Energy Corporation can perform further testing afterwards. Thursday afternoon, The Energy Corporation and BestBrains plan the scope of the next iteration taking tasks from the backlog. The Energy Corporation ensures that the backlog is prioritized before the planning meeting. BestBrains ensures that items on the backlog are estimated before the planning meeting"* (Thorup & Jensen, 2009, p. 200),

4. Liability and ownership of the solution

- In the 'Agile Contract Primer' Arbogast et al. (2012, p. 4) mark that liability is perhaps the most difficult area in contracting. An agile approach is not changing this. Nevertheless Arbogast argues that applying agile will cause less risk in the project: *"Agile approaches enables rapid incremental deployable deliverables and collaborative decision-making between the parties, and so relieves pressure on liability, warranty, and similar issues."* Arbogast does not suggest any other methods than used in tradition contracting.
- The law firm Bird&Bird (2016, p.18) outlines that the issues and discussions concerning liability, in many areas, be largely the same for agile projects as for waterfall projects. It needs to focus on putting an overall cap on the supplier's liability. And, areas where the client may want the suppliers to have unlimited liability. This depends per project. The parties should agree upon this before the project starts.

5. Ownership of the solution

It came forward that the intellectual property rights mainly depends on the kind of project: In the case of a large, complex, tailor made project: share everything, however the supplier should keep the right of repetition. In the situation of small projects: be transparent about the progress, however the supplier should keep the 'know how'.

- Bird&Bird (2016) do not give a clear favour of the intellectual property rights. The paper mainly addresses – if the client does not own the IP (intellectual property) rights – there should be an appropriate licence in favour of the client.

6. Project completion: 'definition of done' and termination of the contract

How will parties determine whether or not enough value has been achieved after a sprint/increment? This has to be agreed upon.

- Opelt et al. (2013) suggest to set up a general set of criteria for each sprint. After each sprint a 'checkpoint phase' takes place. Both parties will then decide if the result complies with the agreed set of criteria.
An increment is 'done' when ten criteria are met. These criteria are only applicable to software products (Opelt, Gloger, Pfarl, & Mittermayr, 2013, pp. 107-108).
- Bird&Bird (2016) also propose acceptance criteria, four steps have to go through:
 - The scope of tests to be conducted and passed;
 - All codes have been reviewed;
 - All coding standards have been met;
 - Any necessary documentation has been completed.
- Thorup and Jensen (2009, p. 200) wrote the following clause: *"The customer conducts the acceptance test. The acceptance test is a test of functionality, documentation, interfaces and integration .The acceptance test is passed when there are no qualified errors. Qualified errors are errors that reduce the utility for the customer and that cannot be said to be unimportant"*
- Arbogast (2012, p. 22) states that because acceptance is taking place after each iteration, this must be an easy exercise; *"only the framework for acceptance must be contractually clear."* An example of this framework is given in appendix B.3.

- The AgilePM handbook defines that during the start of each iteration (sprint or increment) the acceptance criteria of that iteration should be agreed upon. In Scrum this is called 'definition of done'.

Almost every agile contract addresses that early termination of the contract should be viewed as a positive outcome (Opelt, Gloger, Pfarl, & Mittermayr, 2013; Arbogast, Larman, & Vodde, 2012; Bird&Bird, 2016; Den Norske Dataforening, 2016). It does not mean failure, but a successful outcome that has been achieved early. As some argue that this will never happen in practice, most say it should at least be made possible by the contract, since it is a desirable outcome (Arbogast, Larman, & Vodde, 2012).

- Opelt et al. (2013) suggest to include exit points in the contract. However the client should pay five percent of the remaining balance to the supplier.
- Sutherland's idea of '*money for nothing, change for free*'¹⁷ describes the situation where the client can terminate the project early, but pays 20% of the remaining budget of the project. He sees this as a reward to the consultant of delivering enough value sooner and as a risk premium for the supplier that has to relocate its resources.
- Arbogast (2012, p. 21) argue in the 'agile contract primer' that ideally the client must be able to stop the project after each iteration without any penalty. However, since the developer often cannot easily cope with such insecurity this is not possible. Therefore he suggest that an agile-termination-clause should include "*a sliding scale of penalty to the client that reduce over time (and iterations).*"
- The PS2000 Agile IT Contract makes termination possible after each sprint, however the client has to pay 4-6% of the total value of the project to the supplier.

¹⁷ Reminder: Sutherland (2008) proposed to provide room for the client to stop the project after any *sprint*, after paying 20% of remaining contract value. The supplier commits to deliver 80% of the *backlog* as high quality (meeting Definition of Done). Moreover, features must be exchangeable for new ones, if this does not require extra time nor cost.

B.2 Example of Opelt’s project vision and product backlog

Note: The format of the description of introduced here can be seen as a suggestion.

Product vision

The first item within the scope of this project is the project vision. The vision for this project is to [xx]. This project should allow the client’s business to [xx]. The parties understand that the project vision respects the following constraints [xx].

The entire contract is defined by the backlog shown in table 2. An example of the detailed individual backlog items is shown in table 3.

Table 2. The backlog as should be included in the contract (Opelt, Gloger, Pfarl, & Mittermayr, 2013, p. 93).

No.	Priority	Backlog Item	Type	Story Points
1	1000	Create user	User story	8
2	995	Search user	User story	5
3	990	Delete user	User story	3
4	985	Manage user requests	Epic	21
5	980	Manage user roles	Epic	13

Table 3. Details of a sample of an individual backlog item (Opelt, Gloger, Pfarl, & Mittermayr, 2013, p. 93).

Epic number	5
Epic name	Manage user roles
Epic description	This epic contains the entire functionality required in the software for user administration. This includes displaying, searching, deleting, editing, and creating new users as well as assigning users to user groups.
Assumption	The assignment of authorizations based on user groups is stored in the software by default. The user groups are not recreated, but assignment of users to these groups is allowed. The search function is limited to pure search by last name. Dual system users will be secured only on the basis of avoiding duplicate user names. Notifications containing user credentials are sent via e-mail.

B.3 Example of Acceptance clause

Arbogast, Larman and Vodde (2012, p. 23) describe this as follows:

- a) *Customer and Supplier define acceptance of the Deliverable as follows:*
 - I. *Deliverable passes all new automated and manual acceptance tests that were defined before the most recent iteration.*
 - II. *Deliverable passes all prior automated and manual acceptance tests, verifying that no regression has occurred.*
 - III. *Deliverable conforms to the “definition of done” that was defined before the iteration.*

- b) *Acceptance tests are incrementally defined together by Customer and Supplier members (“Acceptance Group”), including candidate users of the Deliverable, each iteration. The Acceptance Group reviews acceptance at the end of each iteration, starting at Sprint Review.*

- c) *Customer will have a period of half the business days of one iteration (“Evaluation Period”, “Half Iteration”) after provision to it of the final Deliverable to verify that the Deliverable or part thereof is not deficient.*

- d) *If Customer notifies Supplier in writing prior to the expiration of the relevant Evaluation Period that the Deliverable or part thereof is deficient in any material respect (a “Non-conformity”), Supplier will correct such Non-conformity as soon as reasonably practical but no longer than the length of one iteration, whereupon Customer will receive an additional Half Iteration period (“Verification Period”) commencing upon its receipt of the corrected Deliverables or part thereof to verify that the specific Non-conformity has been corrected.*

- e) *Customer will provide Supplier with such assistance as may reasonably be required to verify the existence of and correct a reported Non-conformity.*

C. Questionnaire – Implicit use of agile

C.1 Example of the questionnaire (implicit use of agile)

This is an exploratory interview. The aim and purpose of this interview is to investigate:

- 1) The current usage of agile within Arup (implicit use of agile).*
- 2) Problems and opportunities of the current contractual relations of Arup with their clients.*

To save time the implicit use of agile will primarily be surveyed by multiple-choice question. The contractual problems and opportunities will be examined with semi-structured open questions. The latter is the focus of this research. If the interviewee has any experience with agile also some open question will be asked about the relation of agile in comparison with contracts.

This is part one: survey.

<i>Interviewer</i>	<i>A.O. (Allard) de Stoppelaar</i>
<i>Interviewee</i>	<i>...</i>
<i>Date</i>	<i>...</i>
<i>Time</i>	<i>...</i>
<i>Location</i>	<i>...</i>

A. Introduction

- Graduation research.
- This research is about agile project management in the construction industry, and more specific about the contractual relationship between the client and consultant while using agile project management.
- Scope:
 - Front-end development
 - Client/consultant relationship
 - Private sector
- This interview is about the projects you manage in general. So please think about projects in general and NOT about one specific project.
- Please fill in this questionnaire keeping the actual situation in mind, this is NOT about the preferred situation.

B. General questions

<i>Question 1. Gender</i>	<i>Male / Woman / ...</i>
<i>Question 2. Age</i>	<i>...</i>
<i>Question 3. Function</i>	<i>Project Manager/Contract Manager /...</i>
<i>Question 4. Years of experience</i>	<i>...</i>

Question 5. Highest education VMBO / HAVO / VWO / MBO / HBO / WO / ...

Question 6. Field of education ...

Question 7. Which kind of project do u usually manage?

- a. Kind of project? Infrastructure / buildings / ...
- b. Which sector? Private sector / public sector / ...
- c. In terms of time? ... months
- d. In terms of money? ... EUR
- e. In terms of project phases? Initiation (feasibility) / design (VO, DO) / execution
Other: ...

Question 8. What kind of project management methodologies do you use? (e.g.: Prince 2, Scrum, AgilePM, ISO 21500, PMBOK, self-made, combination of ... etc.)

.....

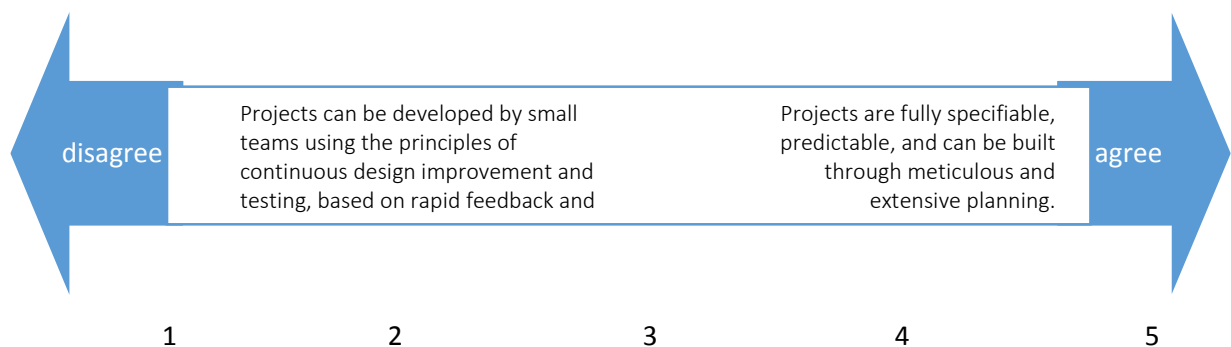
Question 9. Agile Project Management?

- a. Are you familiar with agile? (e.g.: Scrum, AgilePM, etc.) Yes / No
- b. Do you use it? Yes / No
 - a. For what kind of projects? ...
 - b. For which project phase(s)? ...
- c. Do you plan to use it? Yes / No / Possibly

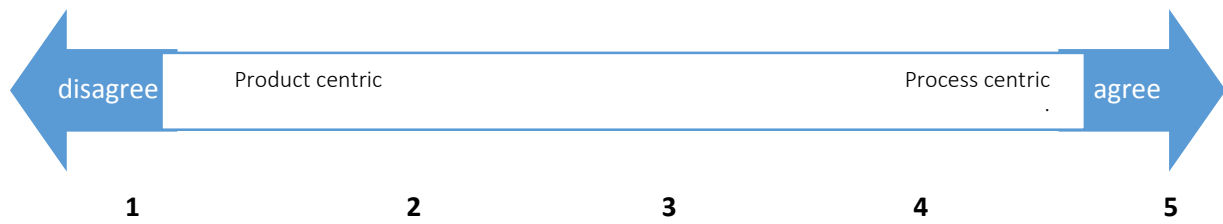
C. Statements

Statement 1

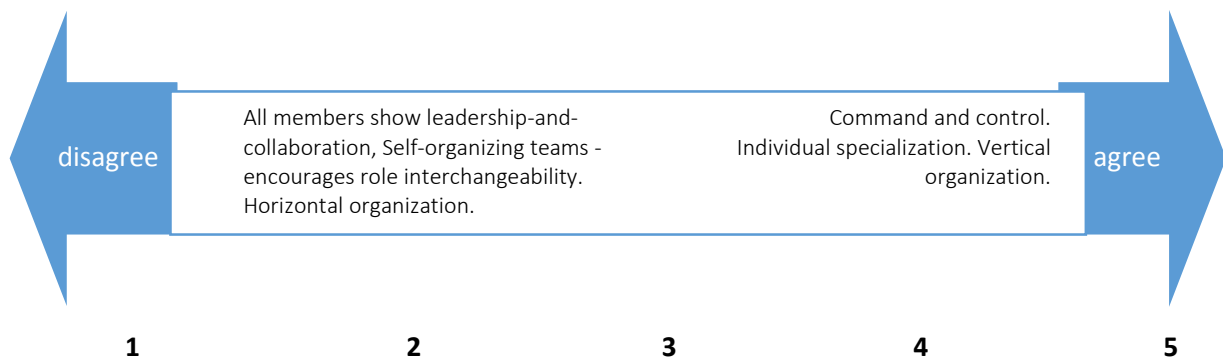
"Projects can be completely pre-defined and pre-planned."



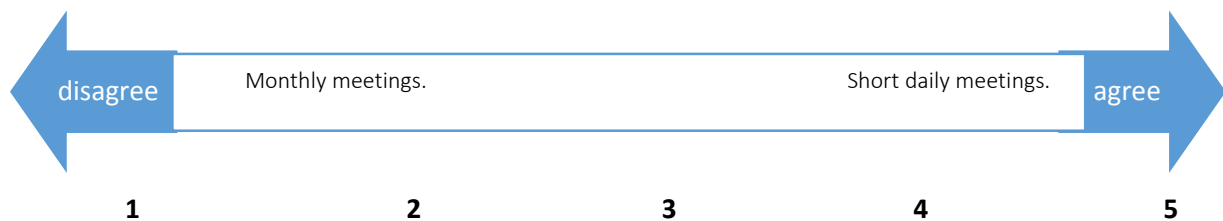
Statement 2
"Project delivery should be focused on processes."



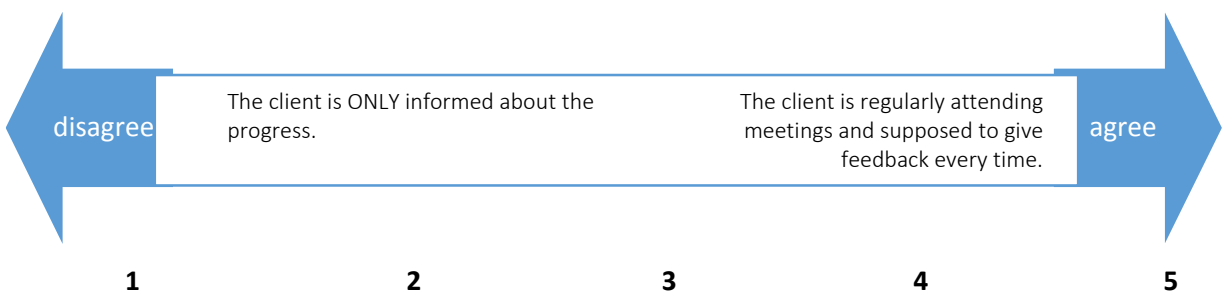
Statement 3
"The management style is 'top down'."



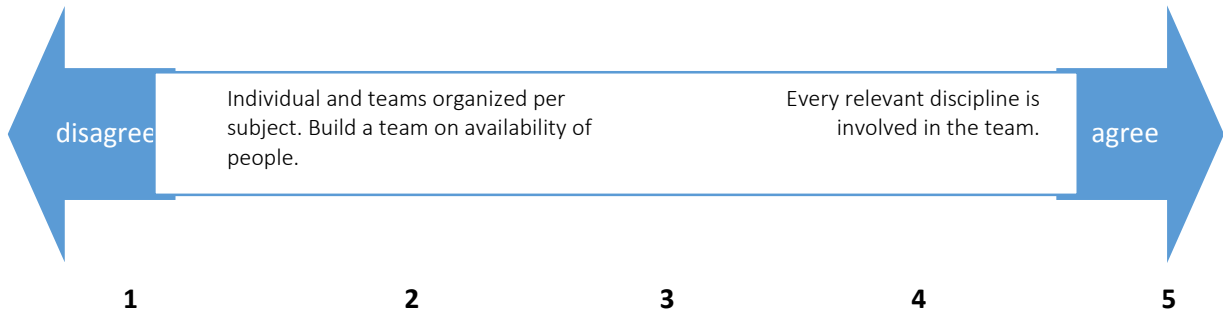
Statement 4
"The project team or sub-team has meetings on a daily basis."



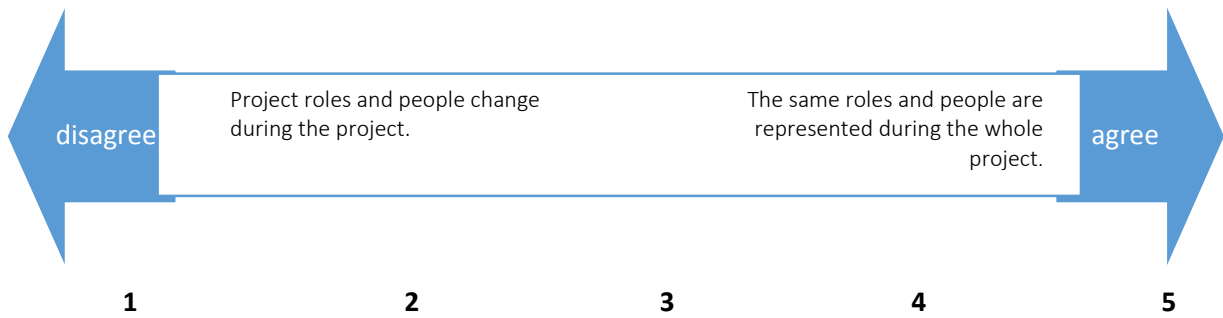
Statement 5
"The client is critically involved in the project."



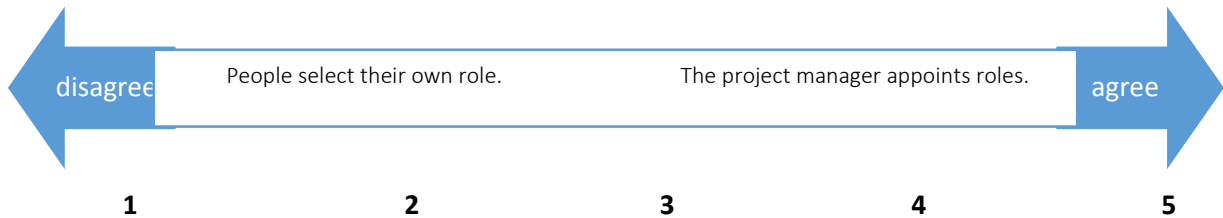
Statement 6
"The team is multidisciplinary."



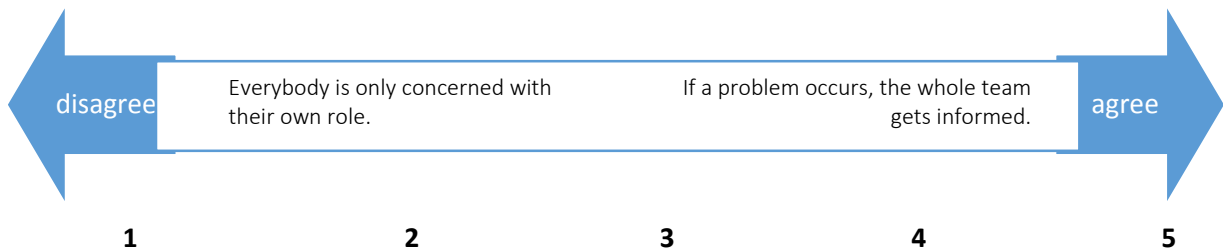
Statement 7
"Project-teams are stable."



Statement 8
"The project manager appoints roles in the team."

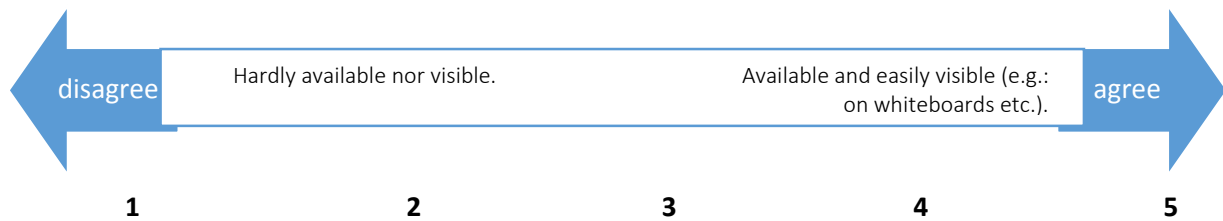


Statement 9
"The teams know from each other what he or she is doing."



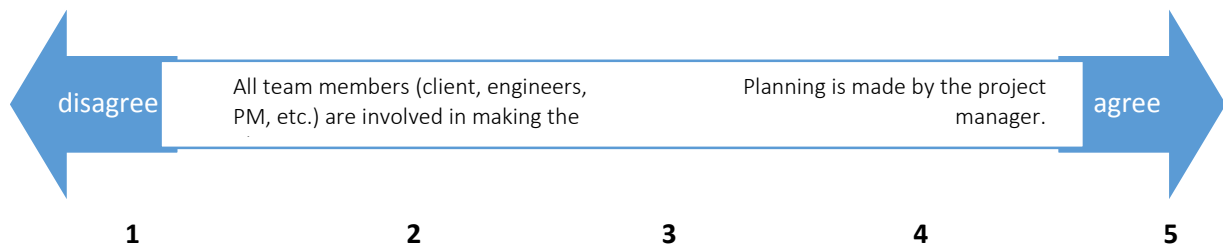
Statement 10

"The information is available and visible for all team members."



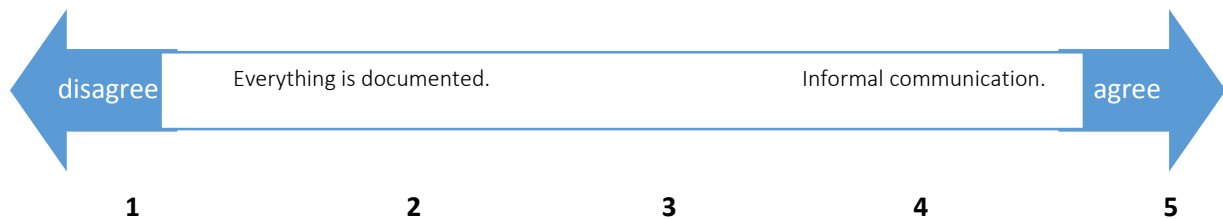
Statement 11

"The schedule is made by the project manager."



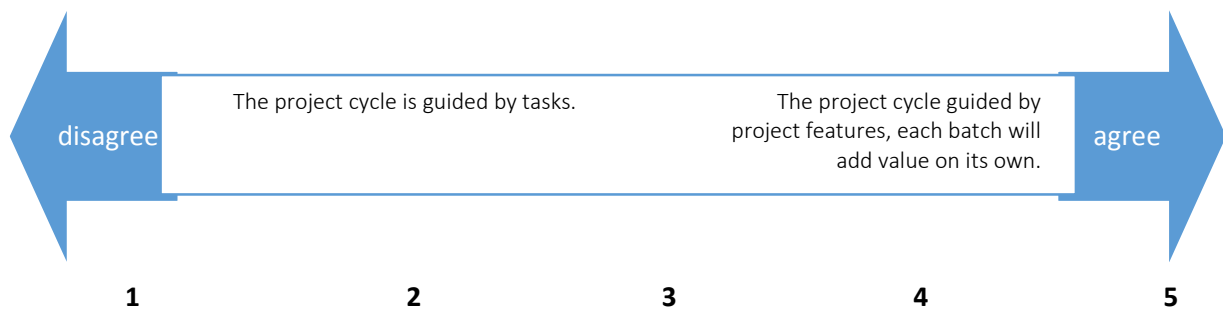
Statement 12

"Communication is informal."



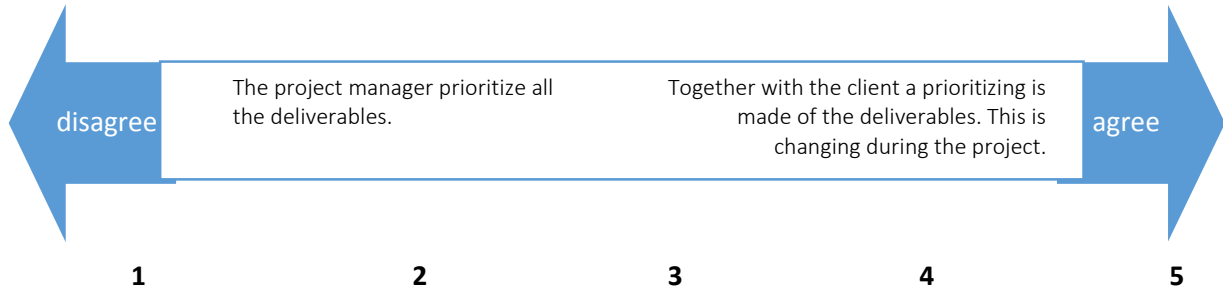
Statement 13

"The project is divided in smaller batches. This batches are determined by project features instead of tasks."



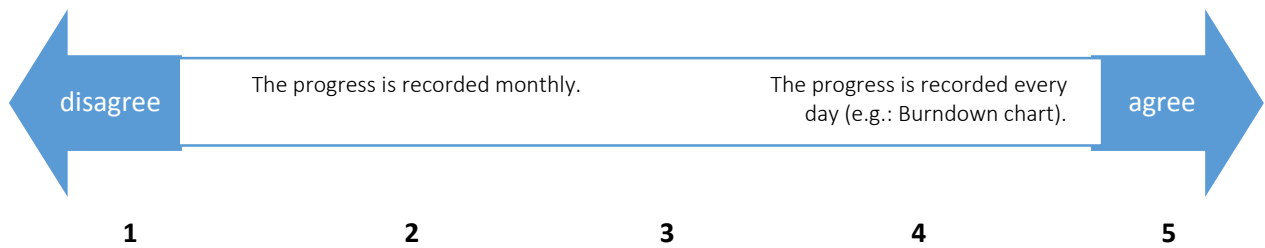
Statement 14

“The schedule is prioritized with input of the client.”



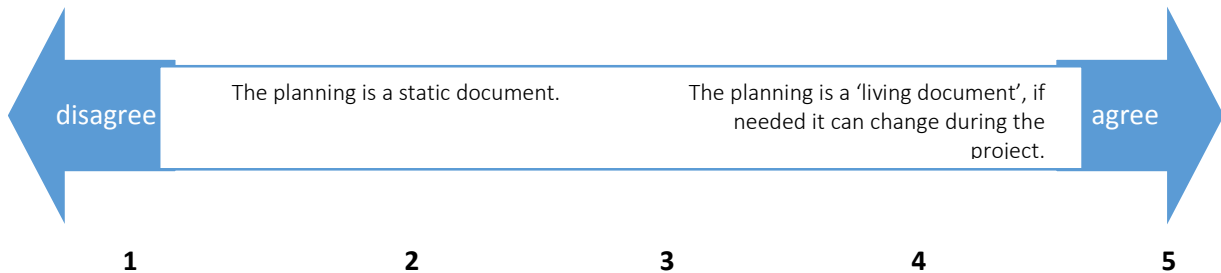
Statement 15

“The project progress is recorded every day.”



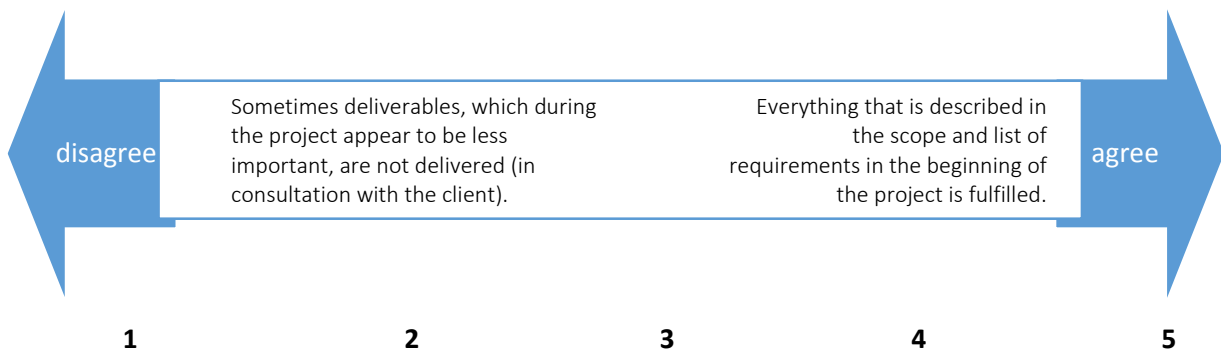
Statement 16

“An over-all planning is made in the beginning of the project, but there is detailed planning per deliverable. This planning is adjusted during the project.”



Statement 17

“At the end of the project the complete list of requirement is always fulfilled.”



A. Closure

1. Comments/suggestions/tips? ...
2. Was there a question that you did not completely understand? ...

D. Exploratory interviews

D.1 Example of the exploratory interview (English version)

Interview at Arup

This is an exploratory interview. The aim and purpose of this interview is to investigate:

- 1) The current usage of agile within Arup (implicit use of agile).*
- 2) Problems and opportunities of the current contractual relations of Arup with their clients.*

To save time the implicit use of agile will primarily be surveyed by multiple-choice question. The contractual problems and opportunities will be examined with semi-structured open questions. This is the focus of this research. If the interviewee has any experience with agile also some open question will be asked about the relation of agile in comparison with contracts.

This is part two: interview. *This part of the interview is 'semi-structured', this means it is the basis for an open interview.*

<i>Interviewer</i>	<i>A.O. (Allard) de Stoppelaar</i>
<i>Interviewee</i>	<i>...</i>
<i>Date</i>	<i>...</i>
<i>Time</i>	<i>...</i>
<i>Location</i>	<i>...</i>

B. Introduction

(Tell the interviewee about the research and the scope)

- Graduation research.
- This research is about agile project management in the construction industry, and more specific about the contractual relationship between the client and consultant while using agile project management.
- Scope:
 - Front-End Development
 - Client/consultant relationship
 - Private sector
- This interview is about the projects you manage in general. So please think about projects in general and NOT about one specific project.
- Please fill in this questionnaire keeping the actual situation in mind, this is NOT about the preferred situation.
- Some questions only need very short answers, this is just to provide context.

C. Questions

Contracts

Focus: contracts (answer the following question specifically for the initiation and design phase (FED)). Longer answers are possible in this sector because the focus of this interview

1. Which party is typically making the contract? (Who is involved in contract preparation?)
2. What are the typical agreements you put in a contract: in what way the agreements are being made and recorded? (Very open question about how does the process look like?)
3. Contract models:
 - a. Do you use standard contract models and general terms and conditions? (e.g.: TNR 2011, DBFM, FIDIC, etc.) (ALSO ASK ABOUT PARTNERING/ALLIANCING)
 - b. What are your general ideas about these models and the general terms and conditions? (very open question)
 - c. Do you often add or skip clauses (if the answer is yes, which one)?
4. How do you keep the contract flexible? (for changing scope etc.)
5. Contractual conflicts:
 - a. How often the conditions of contract (time, cost, scope, quality ...) are exactly met and how often you face conflicts like delays/ cost overruns/....?
 - i. How do you negotiate with client in such cases?
 - ii. Does the contract provide room for flexibility in time, cost, and/or scope?
 - iii. Is it possible or easy to incorporate changes?
 - b. How do you make sure that agreements are met afterward (how do you trace agreements)? (In terms of scope/costs/time changes etc.)
 - c. How do you resolve conflicts? (Go to court for judgment?)
 - d. What should be changed to avoid conflicts?
6. In what manner is your work influenced by contractual agreements? (very open question)
7. Contractual obstacles in relation to project management:
 - a. What are the obstacles, relative to (conventional/agile) project management that you encounter with contracts? (and in what way is the contract the source of this problem)
 - b. What should be changed to avoid this in the contract? (relative to conventional and agile pm)
8. How do you look at relations vs. contracts? (explain research of Suprpto & agile manifesto: customer collaboration over contracts negotiation)
9. Communication:
 - a. What is going well/wrong it terms of communication?
 - b. Do you involve this in the making of the contract? (clauses etc./ and in the case of agile pm?)
10. What is your idea about the current contracts and what is going well and/or wrong? (very open question and also ask this relative to conventional (or agile project management))

Financial provisions

1. How do you define the financial provisions? (also discuss: fixed price vs. reimbursable)
2. How do you see this with an agile management approach? (if the interviewee is common with the concept of agile project management)
 - a. Sprints?

Scope

Focus: contracts and implicit agile project management

1. Definition of scope:
 - a. Who is involved in defining the scope? (e.g.: Arup, client, contractor, etc.)
 - b. How does the client define the scope? (e.g.: is the scope defined in an iterative way?)
 - i. To what extent of detail? (is the scope completely clear)
 - c. How do you define the scope in the contract? (do you include a list of requirements, etc.)
 - i. Is this always clear to all parties?
 - d. To what extent does the scope change along the way of the project?
 - i. How do you manage those changes? (and in perspective to the contract → check if this is already discussed in the previous section)
2. How do you evaluate the project if the scope is realized according to the client requirements? (e.g.: in terms of added value or delivering the requirements)
 - a. How does Arup or the client trace the realization of the scope?

Agile

First check if the interviewee is common with the concept of agile project management.

1. What do you think about the concept of agile project management? (very broad question, also ask about the applicability of agile per project phase).
2. What do you think of agile project management in relation to contracts?
 - a. How would you include sprints, etc.? / Communication / Financial provisions

D. Closure

Wrap-up questions:

3. What is going well? (open question about both project management and contracting)
4. Further questions?
5. Anonymity?
6. Comments/suggestions/tips?

D.2 Exploratory interview with Project/Contract Manager I

A. General information

Interviewer	A.O. (Allard) de Stoppelaar
Date	25 August 2016
Time	15.00
Location	Arup Amsterdam
Age	43
Function	Project manager
Years of experience	16
Highest education	WO, BSc. Architecture, MSc. Building Technology
Kind of projects and sector	Buildings, public and private sector
Average project time	12-60 months
Average project costs	7 – 40 million EUR investment costs
Project phases	planning/design, execution/controlling
Management methods	PRINCE2, IPMA, GROTIK
Familiar with agile	yes
Do you use it	no
Plan to use it	possibly

B. Contracten

Focus: contracten (beantwoord de onderstaande vragen specifiek voor de initiatie en design fase (FED)).

1. Welke partij maakt normaliter het contract? (Wie is hierbij betrokken?)

“De klant, of de projectmanager. Waarmee ik dus bedoel dat de projectmanager dit namens de klant doet. Wij schrijven wel vaak: “Zo willen we het hebben en dit zijn onze voorwaarden.” Soms komt er in de uitvraag al hoe ze de voorwaarden willen hebben. Anders proberen we de eerste te zijn, de schijnt een voordeel te zijn. Legal gezien wordt het contract echter door de klant. (organogram getekend, het organogram is contractueel soms iets anders dan hoe het operationeel zit. Contractueel zitten we vaak naast de aannemer (dus het standaard model)). Wij maken vervolgens de contracten voor de architect etc.”

2. Wat zijn typische afspraken in een contract: op welke manier worden die gemaakt en vastgelegd? (open vraag over het gehele proces)

“Wij proberen onze eigen voorwaarden hierin te verwerken (voorwaarden van Arup m.b.t. aansprakelijkheid). We hebben onze eigen aanvullingen. Dan beginnen we met het DNR 2011 en daarna toe voegen we extra dingen, zoals meerwerk.”

“Contract is stap 1, vervolgens maken we een PIP, dus dan zeggen we nou zo zijn we het van plan om het te doen en de klant moet dat dan goedkeuren. En vervolgens de fase documenten, bijvoorbeeld aan het eind van de haalbaarheidsfase. Daar verzamel je alles in. En dan ga je door naar de volgende fase. En voor elke nieuwe fase stel je weer een plan op.”

Doe je dit echt in contractvorm, inclusief handtekening?

“Nee, dat niet. Het zijn gewoon afspraken, je brengt het in een projectgroep en het gaat naar de stuurgroep en die stemt ermee in. Je dient het dus ook echt formeel in, inclusief een nieuwe planning. Maar wat er gebeurt als de einddatum echt veranderd... ligt ook aan het project. Ik denk wel dat het rechtsgeldig is. Verslagen zijn in ieder geval heel belangrijk.”

Hoe kijk je dan aan tegen “working products over documentation”?

“Ja, ik denk dat ik in dat opzicht al best agile ben. PRINCE2 heeft veel meer documenten. Fasedocumenten vind ik wel heel belangrijk, daarmee trek je een ‘line in the sand’, dus een soort sprint, en dan volgende fase. PRINCE2 heeft zoveel documentatie. En een fasedocument kan ook in een paar pagina’s i.p.v. 40 pagina’s zoals ik in het verleden heb gezien. Maar dat document is wel belangrijk, beschrijf het desnoods met bullits. Ook bespreek je dan je uitgangspunten en je delta.”

3. Contractuele modellen:

- a. Gebruikt u standaard contractuele modellen en algemene voorwaarden? (bijvoorbeeld: DNR2011, DBFM, FIDIC, etc.)(vraag ook naar partnering en alliancing)

“Wij gebruiken voornamelijk het DNR2011. Alliancing doen wij binnen PPM niet. Misschien bij infra, die gebruiken wat vooruitstrevende contracten.”

- b. Wat zijn uw ideeën over de contractmodellen zoals de DNR2011 en standard voorwaarden? (zeer open vraag)

- c. Verwijdert of past u vaak clausules aan in de standaard contractmodellen? (en welke)

“We hebben onze eigen aanvulling op het DNR2011. Die zal ik je opsturen.”

4. Hoe houdt u het contract flexibel? (bijvoorbeeld voor een veranderende scope etc.)

“Meestal gaat het vooral over scope changes, die moet je dan vervolgens gewoon bespreken met de klant. Vaak willen klanten een lumpsum en als je een lumpsum aanbied dan maak je eigenlijk juist geen flexibel contract. Dan wil je juist komen praten over meerwerk, als X, Y of Z veranderd.”

Is dit dan een voordeel voor jullie, als de scope veranderd, dit levert meerwerk op?

“Nee, niet altijd. Soms is het veel efficiënter om het niet te veranderen, voor beide partijen. Maar de scope veranderd altijd, de klant weet niet precies wat ze willen. Maar bij meerwerk heb je nul risico. Want je zegt: ‘Als je dit wilt, dan kost het je x uur.’ Plus bij meerwerk, als je het weet dat je het alsnog redt binnen budget en er komt een scope change, niemand zal die laten liggen. Want je hebt uiteraard ook projecten die tegenvallen, of waar je je vergist hebt. Dus voor het grote geheel moet je dit ook doen. Dus projecten moeten elkaar absorberen. PPM is vrij scherp in meerwerk, maar de gemiddelde ingenieur denkt niet gelijk zo, die denkt vaak alleen in kwaliteit.”

5. Contractuele conflicten:

- a. Hoe vaak voldoet u aan de afspraken in een contract (tijd, scope, kosten, kwaliteit) en hoe vaak is er spraken van conflicten hierover (uitloop, extra kosten, etc.)?

- i. Hoe onderhandel je hierover met de klant?

“Mediation proces.” (zie vraag 5c)

- ii. Bied het contract ruimte voor flexibiliteit voor tijd, kosten en/of scope?

“Bijvoorbeeld je hebt een VO en DO. De kostmanager maakt daar dan een raming van. Die raming valt eigenlijk altijd verkeerd uit. Dan kun je zeggen VO % nauwkeurigheid en DO 10 % toleranties. Dus als het iets anders uitvalt dan maakt het niet uit, maar als je over die afgesproken nauwkeurigheid gaat dan moet je het kunnen verklaren. Maar bij scope changes zal die vaak moeten bijbetalen.”

- iii. Is het eenvoudig veranderingen door te voeren in een contract?

“Ja, dan voegen we het fasedocument toe. Dit kan echter uiteraard wel extra kosten met zich meebrengen.”

“De ontwerpende partij draagt bijna nooit het risico, de aannemer is meestal verantwoordelijk. Ook omdat de aannemer weer dingen wil veranderen. Daarom wordt het intellectuele eigendom er ook vaak uitgehaald.”

- b. Op welke manier houdt u controle over de vooruitgang van het project en of aan het volledige PvE wordt voldaan? (scope/kosten/tijd veranderingen etc.)
- c. Mocht een conflict voorkomen, hoe lost u deze op? (mediation, rechtbank, etc.?)

“Nou ik heb een keer een mediator traject meegemaakt. Ik was PM met twee neven aannemers. Ik houd sowieso niet van deze constructie, want je hebt geen stok om mee te slaan. Dit was een beetje een grijze organisatie. Iedereen hangt gelijk onder de klant. Na conflicten zijn we naar een mediator traject gegaan. Daarbij zeg je dan: iedereen committeert zich aan de uitspraak’. Daardoor hoef je niet naar de echte arbitrage. Dit doe je om advocaatkosten te besparen en bij mediation wordt de schuld vaak verdeeld en bij de rechtbank niet. Dit is een wat minder dure oplossing en is ook wat meer in samenwerking. Met een contract met een aannemer zeg je meestal: het Nederlands recht is van toepassing en bij conflicten ga je eerst naar arbitrage, of dat mediation is, weet ik niet. Arbitrage is een technische rechtbank en die hebben er meer verstand van en mediation kan nog technischer. Ik weet het verschil niet helemaal meer.”

- 6. Op welke manier wordt uw werk beïnvloed door contracten? (zeer open vraag)
- 7. Contractuele obstakels in relatie tot projectmanagement:
- 8. Hoe kijkt u naar relaties vs. contracten? (vertel over het Agile Manifesto: customer collaboration over contracts negotiation en het onderzoek van Suprpto)

“Zie ook vraag 3.d. Bij alle contracten wil het op basis van vertrouwen doen. Je wilt niet een vechtelijke relatie met een klant. Dan ben je alleen maar aan het onderhandelen en dan komt er helemaal geen werk meer uit.”

- 9. Communicatie:
 - a. Wat gaat er goed/slecht qua communicatie?
 - b. Verwerkt u ‘communicatie’ in het contract?

“Ja, wat je meestal doet is een projectgroep meeting, om de week, of ligt aan het project. Zo’n projectgroep meeting is wel een beetje een formele meeting. Daar zeg je, we liggen nog op schema, of dit zijn de issues die we hebben etc. Dat is met de klant erbij. In ieder geval de projectleider van de klant en als je er niet uitkomt ga je naar de stuurgroep. Zij krijgen dan alle stukken en die geven er een tik op of niet. De stuurgroep bestaat uit mensen van een hoger niveau, dus een soort project board. Senior etc. Dit zetten we bijvoorbeeld in een PIP of een offerte. Maar soms zet je het ook al in je offerte. Bijvoorbeeld: ontwerpgroep, elke twee weken, stuurgroep, een keer per fase, dat soort dingen. Meestal zet je het ook in het contract. Meestal zeg je ook de klant krijgt 2 weken om te beslissen over dingen. Want anders lopen we uit de planning, daar zijn we ook verantwoordelijk voor. Het proces leg je dus gewoon vast met de klant.”

- 10. Wat is uw huidige idee van contracten in relatie tot project management, en wat gaat er goed/slecht? (zeer open vraag)

Verwerkt in andere vragen.

Financiële provisies

1. Hoe legt u de financiële bepalingen vast in het contract? (bespreek hier ook: fixed price vs. reimbursable)

Bij andere vragen al besproken

2. Hoe ziet u dit met een agile manier van werken? (voor deze vraag moet de geïnterviewde bekend zijn met het concept van agile project management)
 - b. Sprints etc.?

“Tja hoe je dat moet doen? Misschien uurtje factuurtje, maar dat is ook lasting. Het risico ligt dan bij de ontwikkelaar of de aannemer. Maar dat is op een of andere manier in Nederland altijd wel zo. Maar de winst dan ook. Dit heeft Arup natuurlijk niet, wij maken uren. Wij zijn geen risicovolle onderneming.” Zie ook vraag 3d.

Scope

Focus: contracten en impliciete vorm van agile projectmanagement

1. Beschrijving van de scope:

- a. Wie is er betrokken bij het opstellen van de scope? (bijvoorbeeld: Arup, client, contractor, etc.)

“Hangt van het traject af maar anders vaak beide partijen”

- b. Hoe beschrijft de klant de scope (is de scope bijvoorbeeld op een iteratieve manier vastgelegd?)
 - i. Tot welk niveau van detail?

“Vaak is het gewoon goed om hierin heel duidelijk te zijn.”

- c. Hoe beschrijft u de scope in het contract? (PvE, offerte, etc.?)
 - i. Is de scope altijd helder voor alle betrokken partijen?

“Nou klanten hebben soms wel andere verwachtingen. Wat wij bijvoorbeeld nooit meenemen en als je bouwprojecten doet weet je dat, we nemen alleen gebouw gebonden installaties mee. Daar ontstaat weleens discussie over. Dat is aan de PM om dat duidelijk te blijven herhalen. Gebruikers verwachten dit nog weleens namelijk. De DNR 2011 geeft dit opzich wel aan in de trant van regels en richtlijnen.”

- d. Op welke manier verandert de scope tijdens het project, en in welke mate?
 - i. Hoe ga je om met deze veranderingen? (en hoe ga je hiermee om in perspectief tot het contract?)

“Altijd, dit levert meerwerk op. Wat dat meerwerk onwijs op zijn hand speelt, zijn de Europese Aanbestedingen. Bijvoorbeeld aannemers gaan er super strak inzetten, en dat is hun strategie: werk binnenhalen op 0 procent winst en wachten op meerwerk. Dus dan krijg je juristen op het werk. Maar als je het private doet. Dan kan je als klant zeggen: “je bent eigenlijk 5 procent duurder, ik wil niet verder met je onderhandelen, maar ik wil geen gezeik over meerwerk”. Dit kun je echt afspreken met ook een aannemer. Met EU regels gaan ze elke letter van je bestek lezen.”

Leg je dit ook vast?

“Nee, dat is wel op basis van goed vertrouwen. En omdat ze op ‘repeat business’ werken. Maar bij al deze ‘one off’ projecten met EU regelgeving gebeurt dit wel. Die proposals kosten zoveel geld dat ze wel moeten. Het gaat ook vooral op vertrouwen. Het ligt ook aan de PM hoe agressief je hierop bent.”

2. Hoe evalueert u of het project volgens de vooropgestelde scope is gerealiseerd? (dus in termen van ‘added value’ of het voldoen van de ‘requirements’)
 - a. Hoe houdt Arup de realisatie van de scope bij?

“Nou wat je vaak doet, is bijvoorbeeld tijdens de VO zeggen, lever maar je tekenlijst en deliverable lijst aan. En ik houd er vaak zelf rekening mee, ik weet dat het vaak wat langzamer gaat. En vaak bouw ik 10 procent overzien in. En dus of je de ‘deliverables’ hebt geleverd, klopt het wat we in het PvE (programma van Eisen) hebben beschreven etc.”

Agile

Controleer eerst of de geïnterviewde persoon agile projectmanagement kent.

1. Wat denkt u van het concept agile projectmanagement? (denk ook aan de toepasbaarheid per projectfase)
2. Hoe denkt u over agile projectmanagement in relatie tot contracten?
 - a. Hoe zou je dingen zoals sprints, communicatie, betaalsystemen, etc. opstellen?

“Nou hoe moet dit meerwerk bij Lean of agile? Nou ja, wat ze weleens doen is dat je je uurtarief moet opgeven. En dat ze die meenemen in je beoordeling, dus dan moeten de marges op je meerwerk lag zijn. Dit gaat ook weleens bij Arup. Laatst hadden we nog een lumpsum project waar ook naar onze uurtarieven voor meerwerk werd gekeken.”

[...] “Op zich vinden mensen ‘fixed price’ wel prettig. Dan hoeven ze er niet teveel over te praten. Dus zowel aan de kant van Arup als de klant. Anders moet je alles bijhouden en alles verantwoorden en ben je daar de hele tijd mee bezig. En een aannemer is dat gewend maar wij niet. Maar in het kader van Agile. Wat ze bijvoorbeeld ook doen bij aannemer bij Design and Build, vragen ze vierkanten meter prijzen voor alles. Dus dan krijg je hele tabellen met verrekenprijzen en als ze weten wat ze gaan bouwen dan kan je het makkelijk uitrekenen. Je maakt dan dus prijsafspraken per onderdeel. Daarover onderhandel je in het begin. Bij ons zijn dat dan uurtarieven. Of per workshop meeting of deliverable, dus als bouwstenen opbouwen. Maar veel partijen vinden dit vreselijk, want die vragen gewoon een budget aan en dan kan er geen meerwerk bijkomen.”

[...] “Ontwikkelaar denken misschien meer zo, die bedenken per fase wat ze van een ontwerper willen. Dus dan krijg je allen per fase opdracht. En dan denk je daarna steeds, waarvoor hebben we ze wel nodig of niet. Dus dan knip je het al een beetje op. Dit houdt mensen ook scherp. Maar tijdens de uitvoering wil je niet van partijen wisselen, dat is echt ingewikkeld. Daarom schrappen ze vaak die intellectuele eigendom.”

C. Afsluiting

-

D.3 Exploratory interview with Project/Contract Manager II

A. General

Interviewer	A.O. (Allard) de Stoppelaar
Date	7 September 2016
Time	10.00
Location	Arup Amsterdam
Age	41
Function	Project manager
Years of experience	15
Highest education	WO, Architecture, MSc.
Kind of projects and sector	Buildings, public sector
Average project time	24 months
Average project costs	5.000.000 EUR
Project phases	all (initiation, planning/design, execution/controlling, closure)
Management methods	PRINCE2, PMBOK
Familiar with agile	yes, trained as an AgilePM project manager
Do you use it	no
Plan to use it	yes

B. Interview

1. Welke partij maakt normaliter het contract? (Wie is hierbij betrokken?)

“Soms komt de klant met een model contract en dan moet je daar gewoon aan voldoen. Dan komt de uitvraag, de ‘request for proposal’ (RFP) die kan al een soort contractuele zaak in zich hebben. Soms is het contract zelfs een bijlage hiervan, soms is dat niet zo. Hangt van je opdrachtgever af, als het een zeer professionele partij of bijvoorbeeld gemeente is dan zullen ze dit altijd hebben. Een kleine/ private partij zal dit vaak niet hebben. Je eigen offerte wordt dan het contract met je standaard voorwaarden. Dit zou een goede situatie zijn voor Arup, en dan wordt verwezen naar het DNR. Als je in offerte kan beschrijven wat je gaat doen, dan heb je al een mooi contract. Maar het verschilt dus heel erg. Meestal is het een combinatie van een RFP van je opdrachtgever, plus je eigen plan van aanpak cq offerte, plus je standaard voorwaarden. En alles bij elkaar vormt je contract. En als je het helemaal goed wilt doen zou je moeten afspreken welk document boven welk ander document gaat. Zoals je ook bij een bouwkundig bestek doet met regelgeving. Dat zouden wij ook kunnen doen.”

2. Wat zijn typische afspraken in een contract: op welke manier worden die gemaakt en vastgelegd? (open vraag over het gehele proces)

“Vanuit de klant gezien, meestal wat je moet leveren en wat je moet doen. (activities and deliverables). Als het vanuit ons wordt gedaan bespreken we meestal een plan van aanpak (manier van werken), rolverdeling, en de standaard Arup voorwaarden zijn meer Legal. Dus liability, betalingsvoorwaarden en dat soort zaken zitten in de standaard voorwaarden van Arup. Zo heeft elk document zijn eigen zwaartepunt. Samen vormen ze de afspraak.”

- Scope 1c.

“Bijna altijd beschrijft de klant de scope. En, wij, in de offerte geven we antwoord op onze interpretatie op de scope. Dus de RFP zegt: dit en dit hebben we nodig. Meestal gaat dit heel ver en laat het heel veel onduidelijkheden over. Dus zegt het bijvoorbeeld: je bent verantwoordelijk voor de toezicht op de bouw. Als dit niet verder omschreven staat, dan vinden wij het belangrijk om dit

concreter en beperkter te maken, zodat duidelijk is wat wij in onze raming hebben opgenomen. Zodat achteraf niet blijkt dat je alles moet doen.”

Dus jullie specificeren de scope eigenlijk nog verder, om miscommunicatie te voorkomen?

“Ja, om te voorkomen dat je nat gaat, dat willen we voorkomen. De klant houdt het zo breed mogelijk en die schrijven de demarcatie tussen hun adviseurs niet zo duidelijk. Dan is iedereen verantwoordelijk en zit de opdrachtgever altijd goed. Wij proberen dat natuurlijk zoveel mogelijk af te bakenen.”

Heb je hierin conflicten?

“Conflicten heb je meestal op het eind van een project. Ja, die treden ook al midden in het project op. Dus dat je na de offerte fase, als de honeymoon een beetje over is, en vooral als de aannemer aan tafel komt wordt het echt lastig. Dan komt vaak aan het licht dat de opdrachtgever een andere interpretatie had wat hij vroeg dan wat wij hebben aangeboden.”

Communicatie problemen?

“Ja, communicatieproblemen in de trant van de opdrachtgever was in het begin niet heel duidelijk wie verantwoordelijk is of wat ze willen. Die onduidelijkheid geeft vaak conflicten. Als je het daar niet regelmatig over hebt, bijvoorbeeld in een start bespreking. Dan kan communicatie inderdaad wel een probleem worden.”

Wat zou moeten veranderen?

“Hoe je het zou kunnen veranderen. Is ofwel van te voren heel specifiek te beredeneren hoe je het bedoelt. En dan ook echt actief met de opdrachtgever dat bespreekt voordat je met het project begint: ‘dit is onze understanding, is dat ook wat jullie bedoelen?’. Vervolgens hier ook over praten, dat gebeurt eigenlijk bijna nooit. Maar je kan dit natuurlijk ook in de loop van het project doen. Je vertrouwd elkaar, de opdrachtgever vraag iets breeds, wij zeggen dat we het kunnen doen. En als je in de loop van het project heel duidelijk blijft praten en blijft vastleggen waar je verantwoordelijkheid begint en eindigt. Dan kun je er ook goed uitkomen. Pas als je er niet over gaat praten, en er ontstaat een probleem, dan wordt gezocht naar de schuldige en wordt het een echte issue.”

Denk je dat agile kan helpen?

“Ja, ik denk het wel, als je echt zorgt dat de opdrachtgever een vertegenwoordiger in het team heeft. Dan is het bijna onmogelijk dat de opdrachtgever je niet begrijpt. Je creëert eigenlijk een automatische buy in van je opdrachtgever. Die kan nooit zeggen: ‘ik heb dit nooit begrepen’. Dat las ik ook bij die agile manier van werken, (cursus AgilePM), maar ik vond het wel heel erg geschreven vanuit de adviseurs rol die zorgt dat hij nooit in de problemen kan komen. Dus meer in het voordeel van de opdrachtnemer dan de opdrachtgever.”

“Maar als je het als opdrachtgever het belangrijk vind om je tijd en kosten vast te zetten en de scope los te laten, en dat dan ook accepteert. Dan is het een goede manier van werken. Maar als je als opdrachtgever het niet beseft dat je je scope variabel maakt me agile, dan lijkt het me het zeker geen goed idee.”

Fixed price met fixed time?

“Nou dat is eigenlijk helemaal niet zo raar, dat komt vaker voor dan dat je denkt. Dat je tijd en kosten vast zetten. Wij noemen dat niet agile, maar in feite heeft dat wel die kenmerken. In agreement wat je gaat leveren staat dus ongeveer welke fases het project gaat hebben, welke stappen je gaat doen, ongeveer: dus eerst een plan van aanpak, feasibility, VO, DO. Dus dat kan je best heel vaag omschrijven. Dus, dan kan het alsnog best wel agile manier zijn.”

Beschrijf je dan meer de manier van werken?

“Ja, ik kan me voorstellen dat er projecten zijn die niet werken met kruisjeslijsten, dan staat er gewoon VO en DO. Nou stel dat je als architect een ontwerp gaat maken, dan is het maken van het ontwerpen een project, het realiseren is eigenlijk een nader project, waarin je een andere rol hebt. Die twee projecten hebben veel met elkaar te maken. Maar voor Agile in bouw moet je duidelijk zijn welke bedoel je? Voor het eerste is het makkelijker om agile te zijn. Omdat je wel weet wat het eindproduct van het gebouw moet worden maar het ontwerp staat juist helemaal niet vast. Als je bijvoorbeeld een architect vraagt een school te ontwerpen, dan vertel je niet: zo moet het eruit zien maar “zo moet het functioneren.” Het ontwerp geef je juist als variabelen mee. Het ontwerpen van een school kan dus heel agile zijn. Je weet de tijdsframe, je weet het budget, die staan vast. Soms kan je meerwerk vragen, komt niet vaak voor dat dat voor een school lukt. En je ontwerp, dus wat je levert, is binnen de kaders van het PvE heel flexibel. Het kan er op tien verschillende manier uitzien als het maar voldoet aan het programma van eisen. Dus eigenlijk dat gedeelte, dus wat je als architect als opdracht mee krijgt is heel erg geschikt voor een agile project.”

Is dit ook zo voor Arup?

“Ja, als je bijvoorbeeld een multidisciplinair project hebt, zit je eindelijk in de zelfde situatie. Je weet waar het constructief of installatie technisch aan moet voldoen. Je weet nog niet hoe het eruit ziet, dat moet je zelf bepalen. Maar je weet je fee en de deadline. Dus ja, het heeft potentie. Als je in de praktijk gaat kijken, kan ik als Arup, ook echt de andere dingen van Agile toepassen, dus dagelijkse stand-ups en de andere zaken, dan wordt het wat lastiger. Het is niet onmogelijk, het is heel ongebruikelijk maar niet onmogelijk. Maar qua contract vind ik het juist heel erg agile. Als je kijkt naar de bouw van een school. Dus naar de executie zelf. Dan het meer traject opdrachtgever wil product gebouw hebben en heeft als leverancier de aannemer. Dat zou je ook agile kunnen doen, alleen als je de aannemer in een heel vroeg stadium meeneemt in het ontwerp. Maar als je een traditioneel bestek geeft, dat is het minst agile. Dat is eigenlijk non-agile. Maar als je aanbesteedt met een DO+, dan ben je al iets meer agile. Dan geef je dus die ruimte om van DO+ naar bouwvoorbereiding te komen, die ga je doen samen met de aannemer. Dat is een agile principe. Als je hem nog eerder in het project betreft, in de VO is het nog meer agile. Dan is de aannemer de leverancier en niet het ingenieursbureau voor dat gedeelte.”

En de echte uitvoering?

“Ja, particuliere opdrachtgever, 2 miljoen. Ik neem een aannemer en we gaan samen het mooiste huis voor die prijs maken. Maar je moet wel vertrouwen hebben in die aannemer. Maar je moet wel vertrouwen hebben in de aannemer dat hij je niet belazert.”

Relaties, gaat het hierom?

“Nou, ik denk, dat het vertrouwen tussen het ingenieursbureau en de opdrachtgever is natuurlijker dan het vertrouwen tussen de opdrachtgever en de aannemer. Als ik puur naar de bouw kijk, dan denk ik dat je een adviseur neemt die je vertrouwt en je neemt een adviseur die je beschermt tegen een aannemer. Dus het is logischer dat je de adviseur iets meer vertrouwt, je verwacht dat die aan jouw kant staat zodat je samen sterk staat tegenover die aannemer. Ik zou het ook heel normaal vinden als je contract tussen opdrachtgever en adviseur heel agile is. Maar tussen opdrachtgever aannemer hoeft niet perse agile te zijn.”

En als je naar de financiële kant kijkt? Fixeer je dan sowieso de kosten?

“Die sprints vond ik zelf heel erg lijken op het maken van een VO en Do. Dus gewoon een fase in je ontwerp, dat kun je zien als een ‘timebox’ (AgilePM term). Het visueel maken van modellen zit heel erg in agile, als ingenieursbureau doe je dat ook. Alleen stand-ups en ambassadeur van de opdrachtgever in het team zie ik in de praktijk niet gebeuren, kan wel, lijkt me moeilijk. Agile is niet

bedoelt om dit in je contract te zetten. Als je opdrachtgever niet gelooft in de principes dan heeft het al geen zin. Dus je moet die principes moet je het over eens zijn. Die kun je in een contract zetten, maar daar is een contract misschien niet voor bedoelt."

Dus eerst eens worden over de principes en dan contract?

"Ja, dat lijkt me een goede volgorde. Als je beide weet dat je volgens die principes werkt dan kun je besluiten om het inderdaad op een agile manier te gaan doen. En de prioritized requirement list (PRL) lijkt me belangrijk voor het contract, en de acceptatie criteria. Misschien moet je pas dan het contract tekenen. Hoewel het principe natuurlijk is dat je dat gaandeweg doet."

Belangrijkste van contract?

"Als het goed is, is een contract alleen maar voor escalatie gevallen. Je weet van elkaar wat je doet, dus je zou, als je elkaar goed vertrouwd. Voordat je die PRL hebt een contract kunnen opstellen met een scope die wel heel erg los is. Dus een soort samenwerkingsvorm. Als je dan echt agile gaat werken, dan ga je dat samen doen."

Zou je het dan misschien faseren?

"Zodra je dat gaat vastklikken ben je meer volgens PRINCE2 aan het werken. Dus, als je samenwerkingsintentie, of een samenwerkingsovereenkomst maakt helemaal in het begin. Dan zou je je algemene voorwaarden, legal, liabilities kunnen vastleggen. Als je elkaar vertrouwd kun dan zonder verder contract te maken het project in kunnen gaan."

"Er zijn altijd algemene voorwaarden die moet afspreken in het begin, en dat kan je afspreken los van je scope. Je scope kan je dan heel los in het begin beschrijven en nog een keer aan het eind van je feasibility kunnen vastleggen. Het zou zeker kunnen. Het zou op een heel los, of minder los kunnen. Maar ik denk de projecten die we nu doen, die zijn al best op die manier, denk ik."

Wat zijn de grootste conflict punten in een contract?

"Eh, ja liability. Dus als je ontwerpfout maakt, of je ontwerpt iets wat helemaal niet blijkt te kunnen. Uitloop in de tijd, dus te laat opleveren. Verwachtingen zijn ook belangrijk, dus het begrip van wat er gedaan moet worden."

En als een conflict plaatsvindt?

"Dan ontstaat er een onderhandeling. Als het niet in het contract staat dan moet je erover onderhandelen."

C. Afsluiting

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D.4 Exploratory interview with Project/Contract Manager III

A. General

<i>Interviewer</i>	<i>A.O. (Allard) de Stoppelaar</i>
<i>Date</i>	<i>2 September 2016</i>
<i>Time</i>	<i>16.00</i>
<i>Location</i>	<i>Arup Amsterdam</i>
<i>Age</i>	<i>38</i>
<i>Function</i>	<i>Associate at Arup</i>
<i>Years of experience</i>	<i>18</i>
<i>Highest education</i>	<i>Post HBO, Architecture</i>
<i>Kind of projects and sector</i>	<i>Buildings, logistics, industrial / public and private sector</i>
<i>Average project time</i>	<i>9-24 months</i>
<i>Average project costs</i>	<i>9 – 200 million EUR investment costs</i>
<i>Project phases</i>	<i>Everything</i>
<i>Management methods</i>	<i>PRINCE2, Self-made</i>
<i>Familiar with agile</i>	<i>yes</i>
<i>Do you use it</i>	<i>yes</i>
<i>Plan to use it</i>	<i>yes</i>

B. Interview

Focus: contracten (beantwoord de onderstaande vragen specifiek voor de initiatie en design fase (FED)).

1. *Welke partij maakt normaliter het contract? (Wie is hierbij betrokken?)*

“Het hangt af van de opdrachtgever, kijk in de publieke sector heb je vaak, net als universiteiten, die hebben vaak een vastgoed afdeling. Die hanteren vaak eigen contract voorwaarden. Dus daar adviseer je graag in, maar die willen vasthouden aan hun formats en hun beleid. En bij minder professionele opdrachtgevers, die misschien minder vaak een project doen, dan heb je veel meer een spelende rol, dan stel je eigenlijk zo’n contract op voor zo’n opdrachtgever.”

Gebruiken jullie een modelcontract?

“Jazeker, voor de adviescontracten de DNR 2011. Dit is de basis.”

Wijk je hier vaak vanaf?

“Nee, terwijl je wel ziet dat bijvoorbeeld, de TU Delft, veel afwijkingen opneemt in hun contracten. In principe zit de DNR dusdanig in elkaar dat je dat in mijn beleving niet hoeft te doen. Behalve als je dusdanige risico’s ziet. Dus voornamelijk aansprakelijkheid. Soms is het wel een goed om de basisovereenkomst verder toe te lichten. Die is nu soms wat te summier.”

Welke punten denk je dan aan?

“Project specifieke zaken, die lastig zijn te omschrijven. Of zaken die afwijken van de takenlijst. Dat kan er wel eens toe leiden dat je afwijkt, maar dat is meer een aanvulling op. Dus vooral scope beschrijving.”

Hoe wordt nu vaak de scope beschrijving omschreven?

“Dat hangt er natuurlijk vanaf waar je instapt in het project. De DNR is natuurlijk een voor adviseurs en architecten etc. De projectmanager is er vaak als een van de eerste bij betrokken. En de scope beschrijving moet dan echt vanuit de klant komen. Een conceptovereenkomst wordt aanbesteed. Dan stem je het samen af. Voor de andere adviseurs ligt er vervolgens een PvE. Vervolgens komt de planning etc. Dus het verschilt een beetje van waar je het project instapt.”

[...] *“Functioneel PvE kan ook, en dat op basis daarvan een technisch PvE wordt gemaakt. Hiervoor heb je als klant natuurlijk weer de adviseurs nodig.”*

Hoe besteed je momenteel aandacht aan communicatie?

“Nou het is vaak zo dat het antwoord van klant belangrijk is om weer verder te kunnen. Dus daar moet je de klant ook in meenemen. Daar moet je hem op wijzen, het is natuurlijk vaak dat je op structurele wijze bij elkaar zit. Dan moet je hierin ook duidelijk zijn. Dus het is heel goed om hem er ook te wijzen hij een bepaalde verantwoordelijkheid hierin heeft. Dat is soms lastig, want ‘wie betaalt die bepaalt’.”

Ervaar je conflicten waarbij je het contract erbij haalt?

“Nee, tot nu toe heb ik dat weinig gehad. Nee, in principe niet. Je ziet wel, dat in de periode dat de markt wat minder was, dat de adviseurs zich lager gingen inschrijven dat er meer werd gediscussieerd over meerwerk.”

[...] *“Je moet wel de afspraken die maakt goed vastleggen. Dat beschermt de klant, maar dat beschermt ook jezelf. Wat het belangrijkste is: is de scope wel genoeg helder. Ook daar is communicatie heel erg van belang. Dus om de tafel gaan zitten: ‘dit is wat we hebben afgesproken en dan ga je in overleg’. Soms kosten aanpassing niet extra honorarium maar bijvoorbeeld alleen extra tijd in de planning.”*

Als je kijkt naar agile?

“Aansprakelijkheid, ja dat kan een probleem zijn. Als de klant iets beslist lijkt mij het dat je als adviseur hem wel voor moet waarschuwen. En dan moet je dat heel goed vastleggen. Hoewel het gebeurt vaker dat de architect met iets komt wat tegen het experimentele aanzit. Bijvoorbeeld een materiaal wat niet geschikt is voor de functie maar dan weer mooier is. Daar kom ik dat het meeste tegen.”

Wie neemt daarvoor nu verantwoordelijkheid

“Nou, in principe leg je als projectmanager de mogelijke consequenties bij de opdrachtgever en die maakt vervolgens de keus. Je kan hem waarschuwen en als hij zegt: ‘ik neem dat risico’, tja, dan neemt hij dat risico. Maar dan moet je het wel heel goed vastleggen. De keuzes van de klant zijn erg van belang. Bijvoorbeeld per mail, notulen. Het blijkt toch weer altijd belangrijk. Het gebeurt gewoon weleens dat een opdrachtgever vergeet wat hij in het verleden heeft besloten.”

En hoe kijk je daarbij naar het eigendom?

“Wat je weleens ziet is dat partijen afstand moeten doen van auteursrecht, dat gebeurt dan aan de voorkant. Ik heb dit een keer wel meegemaakt, dat er stond: ‘mocht de partij ermee stoppen dat het eigendom naar de opdrachtgever ging’. Is niet gebruikelijk denk ik hoor.”

Hoe houd je de scope zo flexibel mogelijk, ook in perspectief tot agile?

“Dat hangt ervan af wat de klant verwacht. Als je de scope zo vrij mogelijk houdt, dan betekent dat gewoon, dat je een minder strak geplanned proces krijgt. Want dan krijg je inderdaad een iteratief ontwerpproces. En qua budget is het dan lastig om een duidelijke uitspraak over te doen. Dan dat je gewoon een PvE hebt, het type gebouw, vierkante meters, ambitie op hoofdlijnen. Dan kan je een redelijke investeringskosten raming maken. Maar als een klant zegt: “ik weet het allemaal niet”. Tja dan moet je toch iets vastleggen. Of de klant zegt: “ik heb een zak met geld, de kosten maken niet zoveel uit, ga maar aan de gang met een beperkte scope en samen gaan we iets ontwikkelen”. Maar bij huisvesting is het misschien soms wat duidelijker dan met software. Van VO, DO naar executie.

Maar binnen die fases kan je denk ik zeker wel agile werken. Dat je specifiek op binnen zo'n fase agile gaat werken. Dat je samen met de klant het programma gaat bepalen."

[...] "Dit geldt denk ik ook voor specifieke inrichtingen van laboratoria, dus je weet dan wel hoe groot het gebouw met zijn en welke functies erin moeten komen en noem maar op. Alleen je hebt met allerlei gebruikers te maken in die laboratoria. Dan kan je bijvoorbeeld met die gebruikers gaan kijken wat er in zo'n lab moet komen. Dat zou je wel agile aan kunnen maken, dat moet je zelfs wel agile gaan aanpakken. Alleen aan het einde van een phase moet je wel weten hoe het eruit ziet."

En agile in perspectief tot het betalingssysteem?

"Dat hangt uiteraard erg af van de duidelijkheid van de scope. Als die scope niet duidelijk is dan wordt het lastig om een fixed price in te schatten. Maar over het algemeen, kan je, als die scope wel bekend is, het gemiddeld wel goed inschatten. Maar dit komt ook voort uit ervaring. En met reimbursable moet je natuurlijk wel elk uur kunnen verklaren, en het voordeel van fixed price kan ook zijn dat je door punten efficiënt te werken je misschien wel meer uit de opdracht kan halen. Maar als klant zijnde zou ik niet zo snel een uren opdracht geven, je wilt weten wat je kwijt bent. Aan de andere kant ben je met fixed price als Arup zijnde het goed te plannen en slim in te delen. Maar daarom zeg ik, als de scope niet duidelijk is, of je wilt iteratief ontwerpen en uitvoeren, dan is een opdracht op basis van uren misschien beter voor Arup. Dan ben je tenminste altijd gedekt. Maar het ligt ook zeker aan de klant. Wil hij elk uur in twijfel trekken dan krijg je een vervelend proces en ben je meer hiermee mee bezig dan echt project management van het product."

En meer innovatieve constructies, bijv. alliancie contracten, risico en benefit delen (in perspectief tot agile)?

"Nou, dan ga je een bepaald risico nemen. Ik zie dat niet zo heel snel gebeuren bij ingenieursbureaus. Maar aannemers zijn hier meer van, die kunnen meer risico dragen. Hun omvang, of in ieder geval de omzet is bij hun groter. Zij kunnen deze risico's afdekken. Ik kan ook even niet voorstellen hoe je het risico afdekt hier."

Er is natuurlijk ook kans op winst.

"Ik denk dat de advies wereld hiervoor te behouden is. Ik denk ook dat het erom gaat of je dit soort risico's wilt en kunt dragen. Wat doet dat dan met je ondernemen. Misschien omdat Arup groot zou Arup het wel aankunnen, maar aannemers zijn vaak nog wat groter. Dus die zijn daar denk ik eerder toe bereidt."

D.6 Exploratory interview with Project/Contract Manager V

A. General

Interviewer	A.O. (Allard) de Stoppelaar
Date	21 September 2016
Time	15.00
Location	Arup Amsterdam
Age	39
Function	Project manager
Years of experience	16
Highest education	HBO, Architecture
Kind of projects and sector	Buildings, public and private sector
Average project time	36 months
Average project costs	4 – 20 million EUR investment costs
Project phases	Everything
Management methods	G(R)OTIK (twijnstra method)
Familiar with agile	no
Do you use it	no
Plan to use it	possibly

C. Interview

Focus: contracten (beantwoord de onderstaande vragen specifiek voor de initiatie en design fase (FED)).

2. Welke partij maakt normaliter het contract? (Wie is hierbij betrokken?)

“Het hangt af van de opdrachtgever, kijk in de publieke sector heb je vaak, net als universiteiten, die hebben vaak een vastgoed afdeling. Die hanteren vaak eigen contract voorwaarden. Dus daar adviseer je graag in, maar die willen vasthouden aan hun formats en hun beleid. En bij minder professionele opdrachtgevers, die misschien minder vaak een project doen, dan heb je veel meer een spelende rol, dan stel je eigenlijk zo’n contract op voor zo’n opdrachtgever.”

Gebuiken jullie een modelcontract?

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Wijk je hier vaak vanaf?

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[...] "Dit geldt denk ik ook voor specifieke inrichtingen van laboratoria, dus je weet dan wel hoe groot het gebouw met zijn en welke functies erin moeten komen en noem maar op. Alleen je hebt met allerlei gebruikers te maken in die laboratoria. Dan kan je bijvoorbeeld met die gebruikers gaan kijken wat er in zo'n lab moet komen. Dat zou je wel agile aan kunnen maken, dat moet je zelfs wel agile gaan aanpakken. Alleen aan het einde van een phase moet je wel weten hoe het eruit ziet."

En agile in perspectief tot het betalingssysteem?

"Dat hangt uiteraard erg af van de duidelijkheid van de scope. Als die scope niet duidelijk is dan wordt het lastig om een fixed price in te schatten. Maar over het algemeen, kan je, als die scope wel bekend is, het gemiddeld wel goed inschatten. Maar dit komt ook voort uit ervaring. En met reimbursable moet je natuurlijk wel elk uur kunnen verklaren, en het voordeel van fixed price kan ook zijn dat je door punten efficiënt te werken je misschien wel meer uit de opdracht kan halen. Maar als klant zijnde zou ik niet zo snel een uren opdracht geven, je wilt weten wat je kwijt bent. Aan de andere kant ben je met fixed price als Arup zijnde het goed te plannen en slim in te delen. Maar daarom zeg ik, als de scope niet duidelijk is, of je wilt iteratief ontwerpen en uitvoeren, dan is een opdracht op basis van uren misschien beter voor Arup. Dan ben je tenminste altijd gedekt. Maar het ligt ook zeker aan de klant. Wil hij elk uur in twijfel trekken dan krijg je een vervelend proces en ben je meer hiermee mee bezig dan echt project management van het product."

En meer innovatieve constructies, bijv. alliancie contracten, risico en benefit delen (in perspectief tot agile)?

"Nou, dan ga je een bepaald risico nemen. Ik zie dat niet zo heel snel gebeuren bij ingenieursbureaus. Maar aannemers zijn hier meer van, die kunnen meer risico dragen. Hun omvang, of in ieder geval de omzet is bij hun groter. Zij kunnen deze risico's afdekken. Ik kan ook even niet voorstellen hoe je het risico afdekt hier."

Er is natuurlijk ook kans op winst.

"Ik denk dat de advies wereld hiervoor te behouden is. Ik denk ook dat het erom gaat of je dit soort risico's wilt en kunt dragen. Wat doet dat dan met je ondernemen. Misschien omdat Arup groot zou Arup het wel aankunnen, maar aannemers zijn vaak nog wat groter. Dus die zijn daar denk ik eerder toe bereidt."

C. Afsluiting

-

D.7 Exploratory interview with an Agile IT practitioner I

<i>Interviewer</i>	<i>A.O. (Allard) de Stoppelaar</i>
<i>Date</i>	<i>26 Augustus 2016</i>
<i>Time</i>	<i>09.00-11.30</i>
<i>Location</i>	<i>Amsterdam</i>
<i>Age</i>	<i>33</i>
<i>Function</i>	<i>Product Owner (partner)</i>
<i>Company</i>	<i>The Product Owner (www.theproductowners.com) Woost (https://woost.co/)</i>
<i>Years of experience</i>	<i>7</i>
<i>Highest education</i>	<i>WO, MSc. Artificial Intelligence</i>
<i>Kind of projects and sector</i>	<i>IT, public and private sector</i>
<i>Average project time</i>	<i>4 months to 'never ending'</i>
<i>Average project costs</i>	<i>200.000 EUR per 4 months</i>
<i>Project phases</i>	<i>planning/design, execution/controlling</i>
<i>Management methods</i>	<i>Scrum</i>
<i>Familiar with agile</i>	<i>yes</i>
<i>Do you use it</i>	<i>yes</i>
<i>Plan to use it</i>	<i>yes</i>

No transcript – this was a very open conversation about the subject of this thesis. This helped to form a context. No specific data is used from this interview.

D.8 Exploratory interview with an Agile IT practitioner II

<i>Interviewer</i>	<i>A.O. (Allard) de Stoppelaar</i>
<i>Date</i>	<i>20 September 2016</i>
<i>Time</i>	<i>15.00-16.00</i>
<i>Location</i>	<i>Amsterdam</i>
<i>Age</i>	<i>33</i>
<i>Function</i>	<i>Product owner</i>
<i>Company</i>	<i>The Product Owner (www.theproductowners.com) Woost (https://woost.co/)</i>
<i>Years of experience</i>	<i>6</i>
<i>Highest education</i>	<i>WO</i>
<i>Kind of projects and sector</i>	<i>IT, public and private sector</i>
<i>Average project time</i>	<i>4 months to multiple years</i>
<i>Average project costs</i>	<i>Depends, but average above 100.000 EUR per month</i>
<i>Project phases</i>	<i>planning/design, execution/controlling</i>
<i>Management methods</i>	<i>Scrum</i>
<i>Familiar with agile</i>	<i>yes</i>
<i>Do you use it</i>	<i>yes</i>
<i>Plan to use it</i>	<i>yes</i>

No transcript – this was a very open conversation about the subject of this thesis. This helped to form a context. No specific data is used from this interview.

D.9 Exploratory interview with a Lawyer

Andrea specialises in project development and procurement. She has a wide range of experience in both real estate and construction advising developers, contractors and lenders on PPP/PFI projects including infrastructure, governmental housing, healthcare facilities and waterworks.

<i>Interviewer</i>	<i>A.O. (Allard) de Stoppelaar</i>
<i>Date</i>	<i>23 August 2016</i>
<i>Time</i>	<i>15.00 - 16.00</i>
<i>Location</i>	<i>Amsterdam</i>

No transcript – this was a very open conversation about the subject of this thesis. This helped to form a context. No specific data is used from this interview.

E. Validation

E.1 Example of the expert interview (Dutch)

- This is a validation interview for a graduation research about the contractual relation between Client and Supplier (consultant, architect, and engineer) in the construction industry – using agile project management.
- The scope of this research is:
 - Front-end development
 - Client and Supplier (consultant, architect, and engineer) relationship
 - Private sector
- Please think about projects in general and NOT about one specific project.
- Please answer the question and fill in this questionnaire keeping the actual situation in mind, this is NOT about the preferred situation.

Interviewer *A.O. (Allard) de Stoppelaar*
Interviewee
Date
Time
Location

A. Questionnaire

Question 1. Gender Male / Woman

Question 2. Age

Question 3. Function and years of experience Project Manager, for years
Contract Manager, for years
Other....., for... .. years

Question 4. Highest education VMBO / HAVO / VWO / MBO / HBO / WO / ...

Question 5. Field of education

Question 6. Which kind of project do you usually manage?

a. Kind of project? Infrastructure / buildings /

b. Which sector? Private sector / public sector /

c. In terms of time? months

d. In terms of money? EUR

e. In terms of project phases? Initiation (feasibility) / design (VO, DO) / execution
/ Other: ...

Question 7. What kind of project management methodologies do you use? (e.g.: Prince 2, Scrum, AgilePM, ISO 21500, PMBOK, self-made, combination of ... etc.)

.....
Question 8. Agile Project Management?

- | | |
|--|---------------------|
| d. Are you familiar with agile? (e.g.: Scrum, AgilePM, etc.) | Yes / No |
| If the answer to this question is 'no' go to question 9.d | |
| e. Do you have an agile certificate? | Yes / No |
| f. Do you use agile project management? | Yes / No |
| a. For what kind of projects? | |
| b. For which project phase(s)? | |
| g. Do you plan to use it? | Yes / No / Possibly |

B. Open vragen - pre-conditions

I. Relationship between parties

1. Bent u het hiermee eens? Zo nee, waarom?
 - a. Voorspelt u dat dit problemen oplevert?
2. Legt u dit soort dingen nu contractueel vast?
3. Mist u iets – weet u meer manieren om een relatie op te bouwen/wat doet u nu?

II. Check if a project is fit for agile

1. Bent u het hiermee eens? Zo nee, waarom?
2. Legt u dit soort afspraken ook op dit moment contractueel vast? Zo ja, hoe? Zo nee, is dit volgens u mogelijk?
3. Mist u iets? (of iets in deze fase)

C. Open vragen - pre-conditions

1. Wat vindt u van meer focus op 'process' en 'relationships' in plaats van 'results'?

A. Scope

1. Step 1 t/m 4 - kunt u hiermee werken, ziet u voor- en/of nadelen?
 - a. Wat vindt u van de stap 1 tot en met 4?
 - b. Wat vindt u van de details zo laat mogelijk bepalen: 'respond at the last responsible moment'?
 - i. Helpt dit om latere 'scope changes' te voorkomen?
2. Change management - ziet u hier voor- en/of nadelen in, en is dit toepasbaar in de praktijk?
 - a. Worden de 'scope changes' zo goed gefaciliteerd door het contract?
3. Welke mogelijke problemen voorziet u door deze afspraken?

B. Financial provisions

1. *Wat denkt u van deze drie voorstellen? (Bedenk: de keuze is project specifiek, niet persoon specifiek!)*
2. *Kunt u met alle opties werken, ziet u bepaalde voor- en/of nadelen? Bijvoorbeeld:*
 - a. *Fixed vs. Reimbursable?*
 - b. *Variable scope met fixed quality?*
 - c. *Shared pain/gain? Acceptance criteria?*
3. *Wat vindt u van het idee van betaling sprint/fase om vertrouwen tussen partijen te bewerkstelligen?*
4. *Mist u iets?*

C. Organizational

1. *Denkt u dat de agile rollen en betrokkenheid van de klant contractueel zo goed is vastgelegd? Moet dit überhaupt om een goede samenwerking te bewerkstelligen?*
2. *Welke mogelijke problemen voorziet u door deze afspraken?*

D. General obligations

1. *Denkt u dat de agile management methode zo goed naar voren komt? In hoeverre kunt/wilt u agile vastleggen in het contract, is dit voldoende?*
2. *Welke mogelijke problemen voorziet u door deze afspraken?*

E. Decision-making

1. *Wat vindt u van de test op het einde van een sprint? En dat het project pas door gaat als is voldaan aan de 'definition of done'.*
 - a. *Hoe kijkt u aan naar 'acceptance criteria' en 'test criteria'?*
2. *Welke mogelijke problemen voorziet u door deze afspraken?*

F. Liability

1. *Wat vindt u van het idee van 'postponed liability'?*
2. *Is dit toepasbaar in de praktijk?*
3. *Welke mogelijke problemen voorziet u door deze afspraken?*

G. Ownership and use of rights

1. *Vindt u de twee opties duidelijk en logisch?*
2. *Welke mogelijke problemen voorziet u door deze afspraken?*

H. Termination

1. *Hoe vindt u de "termination" van het hele project geregeld?*
2. *Hoe kijkt u tegen het idee aan van 'early termination'?*
3. *Welke mogelijke problemen voorziet u door deze afspraken?*

I. Disputes

1. *Welke mogelijke problemen voorziet u door deze afspraken?*

D. Afsluiting

1. *Zou dit contract ook toepasbaar zijn op een niet agile project?*
2. *Hebt u nog op- of aanmerkingen?*
3. *Prefereert u privacy?*
4. *Dank.*

E.2 Expert interview – (traditional) project manager I

A. General information

Interviewer	A.O. (Allard) de Stoppelaar
Interviewee	Menno
Date	15 December 2016
Time	09.00 – 10.30
Location	Arup Amsterdam
Question 1. Gender	Male
Question 2. Age	32
Question 3. Function and years of experience	Architect for 3 years Project manager for 2 years
Question 4. Highest education	WO
Question 5. Field of education	Architecture TU Delft
Question 6. Which kind of projects do you usually manage	
a. Kind of project?	Buildings
b. Which sector?	Private and public sector
c. In terms of time?	6 months
d. In terms of money?	1.500.000 EUR
e. In terms of project phases?	Design
Question 7. What kind of project management methodologies do you use?	PMBOK
Question 8. Agile Project Management?	
a. are you familiar with agile	Yes
b. do you have an agile certificate	No
c. do you use agile project management?	No
I. For what kind of projects?	-
II. For what project phase(s)?	-

B. Questionnaire about agile

For the results of the questionnaire see chapter 5 of this thesis.

A. Open vragen - pre-conditions

I. Relationship between parties

1. Bent u het hiermee eens? Zo nee, waarom?
2. Legt u dit soort dingen nu contractueel vast?
3. Mist u iets – weet u meer manieren om een relatie op te bouwen/wat doet u nu?

“Daarvoor heb ik geen ervaring met contracten. Dus ik heb er als project manager bij Arup niet zoveel ervaring mee. Maar ik heb ook bij een IT onderzoeksbedrijf gewerkt, dus niet in de bouw. Maar een bedrijf dat zich richt op de klanten relatie binnen de IT. Daar merk je dat het voornamelijk gaat om de relaties die hier staan. Dat is het enige dat ik hierover kan zeggen. Maar ik begrijp wel heel goed dat je hierop ingaat.”

II. Check if a project is fit for agile

1. Bent u het hiermee eens? Zo nee, waarom?
2. Legt u dit soort afspraken ook op dit moment contractueel vast? Zo ja, hoe? Zo nee, is dit volgens u mogelijk?
3. Mist u iets? (of iets in deze fase)

(na uitleg van aspect): [...] *“Ja, dus je kijkt naar het project, culture. Dat laatste is vooral een punt dat ik veel zag terugkomen in de IT. Grote logge bedrijven hadden hier vaak problemen mee. Banken en dat soort bedrijven kregen hier problemen mee. Ik kan me voorstellen dat in de bouw een zelfde soort cultuur heerst, dus dat het lastig is om te kijken wat voor een soort bedrijven log maar ook complex. Misschien, ik zeg niet Arup, ik denk dat Arup vrij flexibel kan zijn, en moet zijn, vanuit een engineering idee. Dus dat je daar creatiever in bent. Maar als je naar (bedrijfsnaam – Aannemer) kijkt, lukt dat minder goed.”*

[...] *“Ik had wel een vraag over commitment, is dat iets willen zo van” “ja ok ik zou t wel willen” of wil je het echt, en kan je het ook echt. Ook, welk level van agile moet je echt hebben? Dus wat is de definitie van agile. Anders heb je het alleen met commitment, en ik denk dat iedereen wel commitment is.”*

B. Open vragen - contract

2. Wat vindt u van meer focus op ‘process’ en ‘relationships’ in plaats van ‘results’?

[...] *“Vind ik wel een harde lijn. Is die lijn echt zo hard? In mijn optiek ben je op korte interval wel heel erg bezig met result, je bent het aan het opknippen. Is het wel een driehoek, maar misschien met agile een andere vorm.”*

[...] *“Je hebt het misschien niet over resultaat maar over functionaliteit. Ik begrijp het, ik lees hier ook het woord focus. Maar het is niet alleen focus op de onderste twee punten. Maar misschien kan je een aangepast model tekenen, hoewel je misschien niet tever wilt af stappen hiervan. Want er zijn natuurlijk ook meerdere modellen, maar ik vond deze wel helder. Verder denk ik wel dat het ok is.”*

A. Scope

4. Step 1 t/m 4 - kunt u hiermee werken, ziet u voor- en/of nadelen?

a. Wat vind u van de stap 1 tot en met 4?

b. Wat vindt u van de details zo laat mogelijk bepalen: ‘respond at the last responsible moment’?

“Ja dit is natuurlijk heel goed te relateren aan het bouwproces, het programma van eisen. Dus ja, als ik denk wat ik kan noemen, is het voornamelijk de toepasbaarheid. Maar dit is niet heel anders hoe je het nu doet vanuit de architectuur. Misschien is architectuur wel interessant, want daar is het ook onduidelijk, want je hebt een afbeelding en dat moet je combineren met een PvE. Maar dat heb je met engineering natuurlijk ook. Dus bijvoorbeeld een brug, en dan heb je het over dimensies, dat weer speelruimte geeft in prijzen, en dus ook in esthetiek, dat weer gekeurd wordt door de ontwerper.”

Architect keurt zijn eigen ontwerp, slager keurt zijn eigen vlees?

“Als je werkt met een Norman Foster, of een Rem Koolhaas, dan hebben zij een grote invloed op het ontwerp. En in dat proces zou dit heel interessant zijn. Ik heb er alleen ervaring mee met een brug hier. Maar dan zou je het wel goed kunnen terug zien.”

[...] *“Je hebt continue de discussie die je eigenlijk hebt. Een klant valt voor een ontwerp, en die vind bepaalde hoofdlijnen mooi. Een architect verdedigd, of misschien verkoopt het dan vervolgens. Die legt uit waarom het ontwerp de juiste uitstraling heeft. Op die manier krijgt het een esthetische waarde, en die waarde zit altijd wel verbonden met een engineering aspect. Dat zou kunnen in sprints, dat gebeurt nu dus ook een ongeveer, alleen dan in fases. Dus nee het is niet je eigen vlees keuren, iedereen is betrokken in het proces.”*

[...] *“Maar ik denk dat die MMP wel interessant is, die discussie over wat is nu de esthetische waarde, en begrijpt de engineer deze waarde en wat is de waarde uitgedrukt in euro’s.”*

[...] *“Ik denk dat het wel past binnen het proces wat we nu kennen in de bouw, en dan is step 4 vooral erg belangrijk. Je ‘should have’ etc.”*

5. Change management - ziet u hier voor- en/of nadelen in, en is dit toepasbaar in de praktijk?
“Ja, ik denk het wel, dat gebeurd nu ook, je gaat kalibreren. Vaak komt iemand met: ‘dit is het beeld wat we willen hebben’. En het moet een brug zijn voor mensen. Later ga je dit verfijnen. Hoeveel mensen moeten hierop lopen, moet het over water, o hij moet open kunnen en wat is de hoogte t.o.v. het water. Dus je functionele eis en echt eis liggen ver uit elkaar. Wil je twee kolommen? Nee, dat kan te duur zijn, dus dan stop ik er iets anders in. Zo zie ik het voor me. Dat gebeurt ook in project ontwikkeling. Discussies over ramen en vierkante meters, partijen kijken er allemaal heel anders naar.” “Op het dat niveau heb je altijd deze discussie. En dan kijk je opnieuw continue naar het proces en dat loopt wel parallel aan elkaar. Dus dan zou je een parallellen sprint moeten maken.”

[...] *“Ik weet hoe het nu gaat, je bouwt een appartementen complex, daar gooi de je duurste gevel op, zwembad, bioscoop. En dan.. he er moet wat uit.. Nou doe maar de bioscoop, het geen met de minst esthetische waarde.”*

6. Welke mogelijke problemen voorziet u door deze afspraken?

“Het fijne ligt vooral in de toepasbaarheid in de ingewikkelde combinatie tussen engineering en architectuur. Maar die discussie bestaat al zo lang, al sinds we zijn gaan nadenken over esthetiek. Maar ik denk dat dit wel goed omschrijf waar je probleem ligt. De klant bepaald uiteindelijk.”

Respond at last responsible moment?

“Hoe groter het project, hoe complexer. Bijvoorbeeld een raam kan weer invloed hebben op de draag constructie. Wat het doet met het gedrag van het gebouw. Ik denk dat het step 4 is. Wat vind je echt belangrijk. Je moet gewoon erg goed samenwerken, maar dat is wel erg lastig met alle partijen...”

B. Financial provisions

1. Wat denkt u van deze drie voorstellen? (Bedenk: de keuze is project specifiek, niet persoon specifiek!)

“De opties hangen natuurlijk heel erg af van welke partij je spreekt, wat je positie is. Als opdrachtgever klinkt optie twee erg aantrekkelijk. Je hebt het idee bij punt twee dat je alletwee het meest baat hebt bij een goed proces, dus dat je wat overhoudt. Normaal, vooral vanuit de ontwerpende partij wil je bij een fixed price het bedrag zoveel mogelijk benutten, je wilt het ontwerp als architect natuurlijk zo rijk mogelijk maken. Aan de ander kant kan je ook een hele efficiënte architect hebben, die wilt besparen. Maar ik denk dus dat het af hangt met welke partij je aan tafel zit. Met engineering en project ontwikkeling is het makkelijk. Ontwerpende partij is denk ik de meest ingewikkelde partij.”

2. Kunt u met alle opties werken, ziet u bepaalde voor- en/of nadelen? Bijvoorbeeld:

“Ik heb hier nog iet mee gewerkt. Fixed price wel, in het afgelopen project. Dus zoals die target fixed price zonder pain/gain.” [...] “Nummer 1 zie ik niet zo snel toepasbaar, nummer twee vind ik meer toepasbaar dat je een engineer een trigger geeft. Dus dat de project manager pusht op het budget. Maar als je een strak proces hebt ga je er al vanuit dat je daar niet op verliest.” [...] “Ik weet niet of wij pain/gain doen, want wij willen meer instaan voor kwaliteit dan voor prijs. Dus hoe gaan we die kwaliteit vertalen naar gain? Want voor een opdrachtgever gaat het vaak om euro’s. Bijvoorbeeld een project ontwikkelaar wil een kantoorgebouw verhuren, en een voorwaarde is kwaliteit. Dus het

aantrekkelijk maken, dus bijvoorbeeld is sustainable, maar dat kan ook iets anders zijn. Dus hoe verwerk je die eisen. Ik vind het dus een hele lastige.”

3. Wat vindt u van het idee van betaling sprint/fase om vertrouwen tussen partijen te bewerkstelligen?

“Ja, dat kan ook, dat gebeurt denk ik ook. Of inzekere zin gebeurt dat ook. Omdat als je nu een prijsvraag hebt ga je ook in zekere zin kijken naar wat je van elkaar vind. IN het begin met het ontwerp en onderzoek vind je elkaar wel of niet. Dat zijn dan eigenlijk de eerste stappen. Je gooit natuurlijk wel wat geld weg, dus daar moet je op letten. Hoe vaak kan ik de sprint maken en wat houd je eraan over. Kan je het resultaat overzetten naar een andere groep. Dus bijvoorbeeld als bij een ontwerp bij Rem Koolhaas laat maken, en je gaat er vervolgens mee naar een andere architect, dat werkt natuurlijk niet. Maar tot op bepaalde hoogte gebeurt dit ook wel. Dus bijvoorbeeld een feasibility fase. Dus je moet heel goed gaan kijken, wat wil je eruit halen, wat wil ermee, wat kan je ermee. Dus ik ben benieuwd naar nog kleinere stappen. Dan wordt het complexer, kleinere opdrachten, dus flexibeler maar ook complexer, dus dan is de samenwerking belangrijker.”

C. Organizational

3. Denkt u dat de agile rollen en betrokkenheid van de klant contractueel zo goed is vastgelegd? Moet dit überhaupt om een goede samenwerking te bewerkstelligen?

“Je wilt juist in controle zijn, dus dan moet je wel weten wie waar verantwoordelijk is binnen welke tijdsperiode. Wat je eigenlijk ook al beschrijft binnen agile, je hebt teams die helemaal gekwalificeerd zijn voor een taak.”

4. Welke mogelijke problemen voorziet u door deze afspraken?

“Je beschrijft de rollen maar misschien ook de personen, bedenk dat personen ook een ander prijskaartje hebben (bijv. junior of senior)”

D. General obligations

3. Denkt u dat de agile management methode zo goed naar voren komt? In hoeverre kunt/wilt u agile vastleggen in het contract, is dit voldoende?

“Nou ik denk dat dat moet. Want zelfs als je trouwt omschrijf je het ook. Dus je gaat er altijd vanuit dat je iets hebt om op terug te vallen. Je wilt de randvoorwaardes vastleggen. Laten we terugkijken naar onze principes. Als het echt niet gaat tja, dan moet je iets hebben. Elke partij wil ergens op terug kunnen vallen.”

4. Welke mogelijke problemen voorziet u door deze afspraken?

[...] “Weinig commentaar.”

E. Decision-making

1. Wat vindt u van de test op het einde van een sprint? En dat het project pas door gaat als is voldaan aan de ‘definition of done’.

2. Welke mogelijke problemen voorziet u door deze afspraken?

“Je ideeën moet je wel vaak met de klant bespreken anders verlies je heel veel tijd en geld.” [...] “Nou hoe leg je de feedback vast, zou het opsplitsen in inhoudelijk en proces.”

F. Liability

1. Wat vindt u van het idee van ‘postponed liability’?

“Nou ik denk dat het heel belangrijk is.”

2. Is dit toepasbaar in de praktijk?

“Ik denk dat dit het proces en product heel erg kan verbeteren als je dit op een goede manier benadert.” [...] “Je merkt al bij kleinere projecten, bij kleinere producten, binnen ons ontwerp, ons engineering contract. Stel ik zit met iemand en ik vraag aan hem, een review rondom de processen van de klant en product. Bij een review vraag je, schiet erop en geef je commentaar. Terwijl bij een ‘check and approve’ zeg je: check het en ‘approve’ het. Dus ik denk dat het inderdaad eigenlijk heel belangrijk is dat je van te voren met elkaar vastlegt wat je gaat doen. Dat is aan de klant hoe ze daarmee omgaan, en aan de relatie. Dus bijvoorbeeld met je vriendin. Je moet echt in die voorfase in project management omschrijven wat het inhoud. Dus je moet omschrijven wat project management is, wat de teams zijn, wat ze wel of niet mogen zeggen. Zo kunnen alle partijen meegaan in de discussie. Hiermee kan je discussie openen en de klant actiever krijgen, en wellicht tot een beter proces en product komen.” Maar

3. Welke mogelijke problemen voorziet u door deze afspraken?

“je hebt zoveel belangen in een team, ik denk dat het ook tegengesteld kan werken. Je moet die pain/gain weten. Als iedereen gain heeft dan kan dit heel goed en nuttig zijn (B. Financial optie 2). Maar met normale fixed price, dan kan je denken ‘als ik dit doe dan heb ik iig mijn eigen product geleverd.”

G. Ownership and use of rights

1. Vindt u de twee opties duidelijk en logisch?

“Bij bijvoorbeeld een pain/gain proces zou ik het intellectuele eigendom eerder delen.” “je moet het gewoon van te voren per project vastleggen” [...] “Interessant om verder uit te putten, maar ik weet niet of het nu een probleem is”

2. Welke mogelijke problemen voorziet u door deze afspraken?

“Binnen de architectuur mag er niet aan het gebouw gezeten worden, dus ontwerprecht bij architect, en gebruiksrecht bij opdrachtgever.”

H. Termination

1. Hoe vindt u de ‘termination’ van het hele project geregeld?

“Dus een soort ‘pain and gain’.” [...]

2. Hoe kijkt u tegen het idee aan van ‘early termination’?

“Ik zie het verder niet veel voorkomen, maar misschien eerder bij echte onderzoeksprojecten”

3. Welke mogelijke problemen voorziet u door deze afspraken?

“Druk je het uit in tijd, of wanneer is het af. Kan mee gesjoemeld worden..” [...]

I. Disputes

1. Welke mogelijke problemen voorziet u door deze afspraken?

C. Afsluiting

1. Zou dit contract ook toepasbaar zijn op een niet agile project?

2. Hebt u nog op- of aanmerkingen?

Wat vaak naar voren kwam: veel hangt af van het betalingssysteem!

E.3 Expert interview – (traditional) project/contract manager II

A. General information

Interviewer	A.O. (Allard) de Stoppelaar
Interviewee	Ilco
Date	19 december 2016
Time	11.00 - 12.30
Location	Arup Amsterdam

Question 1. Gender	Male
Question 2. Age	39
Question 3. Function and years of experience	Contract manager for 8 years Project manager for 8 years
Question 4. Highest education	HBO
Question 5. Field of education	Building Environment
Question 6. Which kind of projects do you usually manage	
a. Kind of project?	Infrastructure and buildings
b. Which sector?	Private and public sector
c. In terms of time?	25 - 36 months
d. In terms of money?	30.000.000 – 50.000.000 EUR
e. In terms of project phases?	All phases
Question 7. What kind of project management methodologies do you use?	PMBOK / GROTIK
Question 8. Agile Project Management?	
a. are you familiar with agile	Yes
b. do you have an agile certificate	No
c. do you use agile project management?	No
I. For what kind of projects?	-
II. For what project phase(s)?	-

B. Questionnaire about agile

For the results of the questionnaire see chapter 5 of this thesis.

C. Open vragen - pre-conditions

I. Relationship between parties

1. Bent u het hiermee eens? Zo nee, waarom?
2. Legt u dit soort dingen nu contractueel vast?
3. Mist u iets – weet u meer manieren om een relatie op te bouwen/wat doet u nu?

“Ja, dat is natuurlijk heel lastig, want vertrouwen groeit meestal. Vanuit eerste gesprekken moet je al het gevoel krijgen dat je met de juiste partijen praat en met juiste mensen in zee gaat. Dus ja vertrouwen is iets dat kan je niet vastleggen. Dat is er, dat ontstaat of is er niet.”

II. Check if a project is fit for agile

1. Bent u het hiermee eens? Zo nee, waarom?
2. Legt u dit soort afspraken ook op dit moment contractueel vast? Zo ja, hoe? Zo nee, is dit volgens u mogelijk?
3. Mist u iets? (of iets in deze fase)

“Ja, in principe doe je dat natuurlijk nu ook een beetje, wat er binnen Arup gedaan wordt is een ‘bid review’. Dan wordt er ook gekeken of een klant een betrouwbare klant zal zijn. Je kijkt naar ‘willen wij voor die klant gaan werken.’ Voor het uitbrengen van de offerte wordt er een bid review gedaan, dat zijn een aantal vragen. Ik zie dat ook wel voor me in het kader van agile. Dus dat je dan zegt, waar moeten wij minimaal aan voldoen en waar moet de klant minimaal aan voldoen. Je eigen resources moet je natuurlijk altijd goed checken. Heb je zelf wel de mensen en de middelen. Maar bij de klant is dat wel lastig. Ik ben eigenlijk van mening dat je niet alleen bij agile maar ook bij traditioneel project management veel meer betrokkenheid van de klant. Ik ben alleen die betrokkenheid nog nooit eerder in een contract voorgekomen.” “Ja, dat zou dus wel goed zijn, maar het is aan de klant.”

D. Open vragen - Contract

1. Wat vindt u van meer focus op ‘process’ en ‘relationships’ in plaats van ‘results’?

“Waar je dan wel tegenaan loopt, hoe is dat toetsbaar? Want uiteindelijk gaat het om het eindproduct. Dus dat is denk ik gunstiger vanuit de kant van de adviseur. Dus dan moet je dus echt fysiek bij elkaar zitten om elkaar bezig te zien. Je moet wel ergens op afgerekend worden. Lijkt me dus wel lastig, ik zou willen sturen op resultaat.” [...] “Als ik vanuit de klant kijk zou ik vooral gewoon resultaat willen vastzetten.”

Maar soms is denk ik het resultaat voor de klant ook niet helemaal duidelijk.

“Ja, ik denk dat een klant voor zichzelf wel altijd een heel duidelijk beeld heeft hoe het eruit ziet.” [...] “Alleen hoe je tot die uitkomsten komt en of het mogelijk is inderdaad een probleem.” [...] “Dus dan is het wel goed om het op te knippen in sprints, maar het resultaat is altijd een uitkomst van wat je doet.”

A. Scope

1. Step 1 t/m 4 - kunt u hiermee werken, ziet u voor- en/of nadelen?
2. Change management - ziet u hier voor- en/of nadelen in, en is dit toepasbaar in de praktijk?
3. Welke mogelijke problemen voorziet u door deze afspraken?

“Ja, ik denk dat de huidige ontwerpfases ook al ver zo zijn opgeknipt, ik ben nieuwsgierig hoe dit in het huidige proces zou passen.” [...] “Misschien zou je het wel al voor 80% definiëren. Dat zou heel waardevol zijn.” [...] “Op een gegeven moment wil je wel iets opleeren, kijk als je als klant een kantoorgebouw wilt, dan wordt het in ieder geval op deze manier niet een melkfabriek. Dus daar stel je de eisen voor vast, dus wat moet je dan precies opknippen dat je nog kan bijsturen? Ik denk even hardop.”

Misschien is een simpel kantoorgebouwen niet een goed voorbeeld, maar bijvoorbeeld een heel innovatief ‘duurzaam’ project, en je weet niet hoe of wat dan is het beter toepasbaar denk ik. Dat bedoel ik ook met punt 2 (pre-conditions).

B. Financial provisions

1. Wat denkt u van deze drie voorstellen? (Bedenk: de keuze is project specifiek, niet persoon specifiek!)
2. Kunt u met alle opties werken, ziet u bepaalde voor- en/of nadelen? Bijvoorbeeld:
3. Wat vindt u van het idee van betaling sprint/fase om vertrouwen tussen partijen te bewerkstelligen?

“Ja, dat zou je natuurlijk kunnen doen, een soort proefperiode, proeftijd. De vraag is de klant erbij gebaat. Want je wilt iets gerealiseerd hebben binnen een bepaalde planning en budget. En als adviseur wil je ook kunnen plannen. Dus ben je dan gebaad om midden in te stoppen. Ehm, dat is natuurlijk wel heel transparant en klantgericht, maar bedrijfsmatig is het misschien niet zo slim om te

doen. Het zou natuurlijk wel het moment zijn om dat vertrouwen te toetsen. Dus even kort samenwerken.” [...] “Het is ook een stukje beleid dat je voert.”

“Wat wij altijd doen is de ontwerpfase per fase opdragen, dus dan kan daarna stoppen of je gaat door. Dus je levert steeds een rapport op.” [...] “De financiële zekerheid hangt nu inderdaad af van het project. Een kantoorgebouw zijn kerngetallen aan te hangen. Maar je bent in de FED de scope aan het bepalen. Maar het risico van 1 is dat je als manager op het minimale gaat sturen. Maar je weet wel wat 100 procent is, en welke onderdelen het zijn. Dus dat zie ik dan wel zitten”

En optie twee, pain/gain?

“Ja het is een soort bonus malus regeling. In de advieswereld gebeurt dat nu niet. Wel in de aannemerswereld. Ik weet niet waarom het nu niet in de advieswereld gebeurt. Het kan een goede stimulans zijn. Ingenieurs hier hebben nu vaak de neiging om net iets te veel te doen voor wat nodig is.

C. Organizational

1. Denkt u dat de agile rollen en betrokkenheid van de klant contractueel zo goed is vastgelegd? Moet dit überhaupt om een goede samenwerking te bewerkstelligen?
2. Welke mogelijke problemen voorziet u door deze afspraken?

“Ja, ik me daar wel iets bij voorstellen. Maar, dat staat ook in je stuk, je moet een klant hebben die heel erg betrokken is, je hebt een project locatie nodig. Maar het is natuurlijk bijna nooit het geval dat een engineer of een project manager aan 1 project werkt. Hoe ga je dat dan organiseren. Volgens mij kan het goed werken, als je een team bij elkaar zet. Maar het lastige is dat ze nu meerdere projecten doen en dat er altijd een brandje is bij een ander project wat weer geblust moet worden waardoor je gestoord wordt. Dus ik vraag me af hoe dit nu in de praktijk zou werken.”

“Kijkend naar een multidisciplinair project heb je zeker zeven, acht of negen disciplines nodig. Hangt natuurlijk van de opdracht af. En dan heb je pas al die kennis en je hebt al die kennis nodig. Dus niemand kan dit fulltime doen. En als je bijvoorbeeld kijkt naar bouwfysica dan zijn die relatief veel minder tijd kwijt, zelfde geldt voor brandveiligheid. Terwijl constructief een veel grotere hap is. Dus dat loopt dan gelijk al scheef. Dus dan moet je de agenda's wel heel scherp gaan inplannen. Wat volgens mij wel kan, maar dan moeten mensen daar wel voor open staan. Als mensen ook kunnen zeggen: 'dan ben ik voor dat project bezig'. Dus als iemand uit de organisatie hem stoort, ook al is het de directeur, die persoon kan zeggen: 'nee, ik ben nu bezig aan het project'. Anders gaat het nooit werken.”

Ja klopt, vooral als je met meer partijen zit in je project. Dat zijn inderdaad zeker praktische punten die moeilijk zijn. Er is een cultuuromslag nodig.

“Nou als je bijvoorbeeld kijkt naar (project x) waar we een dag in week een technical meeting hebben met de klant, en we doen alle disciplines. Maar je ziet daar inderdaad al dat dat veel gestructureerde zou kunnen. Volgens mij moet je inderdaad, zoals met agile een sprint, veel specifiek per week of per zoveel weken maar 1 onderwerp bespreken. Dus in die zin lijkt het wel te kunnen werken in zo'n opzet.”

Uitleg over 'daily stand-up', en andere processen bij Scrum. (Verdere discussie, niet relevant voor dit onderzoek).

“Je legt nu wel je hele project organisatie vast, maar de hoeveelheid tijd ontbreekt dus eigenlijk nog, en wanneer het dan is. En de project organisatie zou je dan 'agile' moeten vastleggen.”

D. General obligations

1. Denkt u dat de agile management methode zo goed naar voren komt? In hoeverre kunt/wilt u agile vastleggen in het contract, is dit voldoende?
2. Welke mogelijke problemen voorziet u door deze afspraken?

[...] (Geen opmerking)

E. Decision-making

1. Wat vindt u van de test op het einde van een sprint? En dat het project pas door gaat als is voldaan aan de 'definition of done'.
 - a. Hoe kijkt u aan naar 'acceptance criteria' en 'test criteria'?
2. Welke mogelijke problemen voorziet u door deze afspraken?

[...] (Geen opmerking)

F. Liability

1. Wat vindt u van het idee van 'postponed liability'?
2. Is dit toepasbaar in de praktijk?

"Uiteindelijk wat we nu doen is dat we wat als fasedocument neerleggen bij de klant, dat is de waarheid. Maar je merkt wel eens dat inderdaad als er iets midden in het proces iets geroepen wordt dat de klant daarmee aan de haal gaat. Dus ja, ik denk zeker als je op een agile manier wilt werken, dat dit nuttig kan zijn. Want alles wat je roept is een denkproces en creativiteit. Dus ik denk als je het benadrukt dat mensen ook sneller dingen roepen. Dus ik denk dat dat goed is om te doen."

G. Ownership and use of rights

1. Vindt u de twee opties duidelijk en logisch?
2. Welke mogelijke problemen voorziet u door deze afspraken?

"Dit is denk ik zeker een onderdeel wat van belang is voor de architect. Het is nu wel beschermd richting ons. De klant kan er niet mee aan de haal."

En zou dat anders moeten met agile?

"Nou dat is de vraag inderdaad of je daar als adviesbureau bij gebaad bent. Want als er een heel slim idee naar boven komt in het begin, en hij heeft de flexibiliteit om te stoppen. En dan neemt hij het hele goede idee mee. Nou dan ben je als adviseur daar natuurlijk niet bij gebaad. Dus dat is een hele lastige denk ik." [...] "Dit zal denk ik altijd maatwerk zijn. Hoewel dat geldt natuurlijk voor meerder aspecten waar we het over hebben."

H. Termination

1. Hoe vindt u de 'termination' van het hele project geregeld?
2. Hoe kijkt u tegen het idee aan van 'early termination'?
3. Welke mogelijke problemen voorziet u door deze afspraken?

[...] (Geen opmerking)

I. Disputes

1. Welke mogelijke problemen voorziet u door deze afspraken?

[...] (Geen opmerking)

E. Afsluiting

E.4 Expert interview – (agile) project/contract manager III

A. General information

Interviewer	A.O. (Allard) de Stoppelaar
Interviewee	Willem
Date	22 december 2016
Time	13.00 - 14.30
Location	Arup Amsterdam

Question 1. Gender	Male
Question 2. Age	52
Question 3. Function and years of experience	Project manager for 25 years
Question 4. Highest education	WO
Question 5. Field of education	Geotechniek TU Delft
Question 6. Which kind of projects do you usually manage	
a. Kind of project?	ICT / Geotechniek / Construction
b. Which sector?	Private and public sector
c. In terms of time?	3-6 months
d. In terms of money?	100.000 – 1.000.000 EUR
e. In terms of project phases?	All phases
Question 7. What kind of project management methodologies do you use?	PRINCE2, SCRUM, AGILEPM, Self-made (combination of methodologies)
Question 8. Agile Project Management?	
a. are you familiar with agile	Yes
b. do you have an agile certificate	Yes
c. do you use agile project management?	Yes
I. For what kind of projects?	Verander trajecten/ GIS / Geo / ICT / Bouw
II. For what project phase(s)?	All

B. Questionnaire about agile

For the results of the questionnaire see chapter 5 of this thesis.

C. Open vragen - pre-conditions

I. Relationship between parties

1. Bent u het hiermee eens? Zo nee, waarom?
2. Legt u dit soort dingen nu contractueel vast?
3. Mist u iets – weet u meer manieren om een relatie op te bouwen/wat doet u nu?

[...]

II. Check if a project is fit for agile

1. Bent u het hiermee eens? Zo nee, waarom?
2. Legt u dit soort afspraken ook op dit moment contractueel vast? Zo ja, hoe? Zo nee, is dit volgens u mogelijk?
3. Mist u iets? (of iets in deze fase)

“Wat mijn ervaring is dat je aan het begin je klant afspraken zo compact mogelijk houdt. Dus net als met PRINCE2, dat je een projectbrief schrijft, ongeveer 1 A4. En dat moet je ook snel doen. Want meestal vraagt een bestaande klant iets. En als je heel snel om de tafel gaat zitten, en je laat zien wat je wilt afspreken. En gelijk scrumwise alles gaat vastleggen. En dan leg je uit wat Scrum is. Je moet

inderdaad echt uitleggen wat Scrum is! en ook hoe je werkt. Dat moet je echt doen, anders snappen ze er niks van en denken ze dat het een losgeslagen bende wordt. En dat is het niet, dus dit is erg belangrijk.”

D. Open vragen - Contract

1. Wat vindt u van meer focus op ‘process’ en ‘relationships’ in plaats van ‘results’?

“Ja ja, zou ik doen. Je kan wel wat deliverables vastleggen” [...]“Denk goed, wat ik echt nu zie is dat bijvoorbeeld X (Traditional client, overheid), vooral let op planningen. Maar als je in gesprek bent met X en je noemt vervolgens dat je agile werkt, dan werkt dat wel in je voordeel ondanks de klant niet weet wat het inhoudelijk is.” [...]

A. Scope

1. Step 1 t/m 4 - kunt u hiermee werken, ziet u voor- en/of nadelen?

“Jazeker, ik prioriteer nu ook met de klant, dat is ook zeker erg belangrijk. En dat leg ik dan vast. Dan ga ik op basis van wat ze willen maak ik een planning.” [...] “Dit doe ik nu per twee weken.”

[...] “Dus ik denk een soort van project brief maken, dan een presentatie geven over scrum, en dan in je project brief moet je je eerst prioriteiten vast hebben gelegd, en de eerste sprint en het globale overzicht. En dan na je eerste sprint wil je de eerste review. Dit is wat hebben opgeleverd, is dit de richting dat je wilt. Maar je moet dus goed in gesprek blijven met de klant, dan begrijpt hij ook waar je heen gaat.”

2. Change management - ziet u hier voor- en/of nadelen in, en is dit toepasbaar in de praktijk?

“Ja je moet inderdaad vastleggen, de flexibiliteit waarmee je werkt. Dus inderdaad het is geen blackbox, je wilt dat de klant kan bijstellen als meer kennis beschikbaar is.”

3. Welke mogelijke problemen voorziet u door deze afspraken?

“Ik ben tegen zeer projectmatige organisaties gelopen. De klant, X, heel erg projectmatige organisatie. Die willen in de bouw vaak nog controle door projectmatige management methodieken, PRINCE2 bijvoorbeeld. Dan is het vaak wat moeilijker. Maar in bouwkundige projecten kan je denk ik juist dat het wel kan, zoals DeSchool ook (Design School van Stanford University).” [...] “Zo zie ik agile ook, als een methodiek hoe je samenwerkt.”

[...] “Ja de hobbel inderdaad wat klanten zien is dat je het niet in detail kan vastleggen zoals bij traditioneel.” [...] Maar traditioneel snapt een klant een functioneel of technische ontwerp toch ook niet, en je geeft de klant valse hoop.”

B. Financial provisions

1. Wat denkt u van deze drie voorstellen? (Bedenk: de keuze is project specifiek, niet persoon specifiek!)

“Ik denk dat dit de kern van de moeilijkheid vaak is. De klant wil vaak in het begin toch een bedrag horen. Dus dan noem je een bedrag, en dat moet je wel afspreken dat de klant er tijd aan besteed, anders gaat het niet lukken. En als je dat doet krijg je het best mogelijke product wat wij met het hele team kunnen maken. En als de klant dat snapt, dan kan je agile werken.” [...] “Dus optie 1 denk ik dat dan het beste is.” [...] “Optie 3 lijkt me dan weer minder.”

2. Kunt u met alle opties werken, ziet u bepaalde voor- en/of nadelen? Bijvoorbeeld:
3. Wat vindt u van het idee van betaling sprint/fase om vertrouwen tussen partijen te bewerkstelligen?

“Ja, jazeker, dat kan. En het mooie met Scrum is, zelfs als je stopt dan heb je alsnog iets.” [...] “Traditioneel, zou je wat je hebt geen eens meer kunnen gebruiken.”

4. Mist u iets?

C. Organizational

1. Denkt u dat de agile rollen en betrokkenheid van de klant contractueel zo goed is vastgelegd? Moet dit überhaupt om een goede samenwerking te bewerkstelligen?

“Ja ik denk het zeker. Als je het zo aanpakt denk ik dat het goed moet gaan. Het goede van scrum is dat je de klant echt betreft en dat je regelmatig, zichtbaar, laat zien wat je aan het doen bent. Dat heeft mij ongelooflijk geholpen binnen Arup om te laten zien wat mijn team doet.”

[...] “Kijk een klant erbij betrekken is vaak in de praktijk moeilijk. Maar waar het hem vaak inziet dat als de klant merkt dat je vooruitgang boekt en het team enthousiast is, en dat je ook echt iets aan het opleveren bent dan maakt die zich ook minder zorgen.”

2. Welke mogelijke problemen voorziet u door deze afspraken?

[...] “Omdat de klant vaak nu nog wel traditionele producten vragen zoals planning. Dus dan zet ik het maar in MSProjects maar ga ik vervolgens wel ‘Scrumwise’ werken.

Komt dat dan niet in de knoop?

“Ja eigenlijk wel, maar ik merk dat als de rest van de organisatie project matig werkt met zulke plannings. Dan gaat dat knellen. Dan zeggen mensen opeens, ‘jij bent niet zo goed met plannen’. Dus toen heb ik toch weer een planning gemaakt, en door de klant te betrekken ga je dan toch mensen overtuigen dat het werkt.”

[...] “Ik denk dat agile gewoon een zeer goede samenwerkingsvorm is, dat is het voor mij. Dus dit helpt zeker denk ik.”

D. General obligations

1. Denkt u dat de agile management methode zo goed naar voren komt? In hoeverre kunt/wilt u agile vastleggen in het contract, is dit voldoende?
2. Welke mogelijke problemen voorziet u door deze afspraken?

[...] “Ik denk dat agile gewoon een zeer goede samenwerkingsvorm is, dat is het voor mij. Dus dit helpt zeker denk ik.”

E. Decision-making

1. Wat vindt u van de test op het einde van een sprint? En dat het project pas door gaat als is voldaan aan de ‘definition of done’.

“Ja dus wij sturen op kwaliteit, en dus niet met acceptance criteria. Wij sturen echt op kwaliteit.” “het was moeilijk om in mijn project dit met de klant af te spreken, omdat hij ook niet op de hoogte was van Scrum.”

2. Welke mogelijke problemen voorziet u door deze afspraken?

F. Liability

1. Wat vindt u van het idee van ‘postponed liability’?
2. Is dit toepasbaar in de praktijk?
3. Welke mogelijke problemen voorziet u door deze afspraken?

[...] Mee eens, geen commentaar.

G. Ownership and use of rights

1. Vindt u de twee opties duidelijk en logisch?
2. Welke mogelijke problemen voorziet u door deze afspraken?

“Ja, hmm, ik vind dit iets, dat staat buiten de project methodiek in ieder geval, het is zeer project afhankelijk.” [...] “In de software was het vaak licentie bij developer en gebruiker had gebruikersrecht.”

H. Termination

1. Hoe vindt u de ‘termination’ van het hele project geregeld?
2. Hoe kijkt u tegen het idee aan van ‘early termination’?

“Ja hangt ervan af of je op tijd of kwaliteit stuurt. Dus je moet van te voren criteria van te voren afspreken waar je op zou willen sturen.” [...] “Je kan altijd blijven sleutelen als je wilt.”

3. Welke mogelijke problemen voorziet u door deze afspraken?

I. Disputes

1. Welke mogelijke problemen voorziet u door deze afspraken?

E. Afsluiting

1. Zou dit contract ook toepasbaar zijn op een niet agile project?
2. Hebt u nog op- of aanmerkingen?

U heeft zelf in de IT ook gewerkt (ook als klant), hoe werkte het daar?

“Nou toen deed ik het zo. We deden een aantal sprints, en aan elke sprint hing een prijs. En ik heb de functionaliteit beschreven, wel op papier, dus hoe het eruit ging zien. Nou toen heb ik nog wat over performance geschreven en over gebruikersvriendelijkheid. En dat was het in feite.” [...] “Veel was op vertrouwen, want als een leverancier iets oplevert wat niet naar je zin is, dan neem je die leverancier nooit meer. En je kent ze vaak ook wel via via. Soms is dat niet en dan is het ook weer de blauwe ogen. Maar je merkt ook wel snel na een aantal weken welke kant het opgaat, maar dat is vaak moeilijk.”

3. Prefereert u privacy?
4. Dank.

E.5 Expert interview – (agile) project manager IV

A. General information

Interviewer	A.O. (Allard) de Stoppelaar
Interviewee	Sjouke
Date	12 december 2016
Time	11.00 – 13.00
Location	Arup Amsterdam

Question 1. Gender	Male
Question 2. Age	29
Question 3. Function and years of experience	Project manager for 2.5 years
Question 4. Highest education	HBO
Question 5. Field of education	Building engineering
Question 6. Which kind of projects do you usually manage	
a. Kind of project?	Buildings
b. Which sector?	Private and public sector
c. In terms of time?	2-18 months
d. In terms of money?	270.000 – 350.000 EUR
e. In terms of project phases?	All phases
Question 7. What kind of project management methodologies do you use?	PRINCE2, AGILEPM, IPMC-C, ISO
Question 8. Agile Project Management?	
a. are you familiar with agile	Yes
b. do you have an agile certificate	Yes
c. do you use agile project management?	Yes
I. For what kind of projects?	Engineering projects
II. For what project phase(s)?	All

B. Questionnaire about agile

For the results of the questionnaire see chapter 5 of this thesis.

C. Open vragen - pre-conditions

I. Relationship between parties

1. Bent u het hiermee eens? Zo nee, waarom?

“Ja, relaties zijn het belangrijkste, je hoopt dat je het contract nooit nodig hebt.”

2. Legt u dit soort dingen nu contractueel vast?

3. Mist u iets – weet u meer manieren om een relatie op te bouwen/wat doet u nu?

“Wij gebruiken vaak de term inspanningsverplichting. Dus dat je belooft om een bepaalde inspanning doet met als doel een deadline te halen met x product. Maar wat dat x product is dat weet je eigenlijk niet precies. Net zoals in Agile. Dus je belooft dat je op uur basis wordt betaald en een inspanning levert. Er zat altijd wel een plafond bedrag aan, dus zoveel FTE heb je en daar moet je het mee doen.”

En als je het niet haalde dan haalde je het niet, of had je het ook andersom?

“je had allen de inspanningsverplichting. Het gebeurde eigenlijk allebei. Soms moest er een FTE bij, maar het kwam ook zeker wel eens voor dat we eerder klaar waren.”

II. Check if a project is fit for agile

1. Bent u het hiermee eens? Zo nee, waarom?

2. Legt u dit soort afspraken ook op dit moment contractueel vast? Zo ja, hoe? Zo nee, is dit volgens u mogelijk?

“Ja, dat lijkt me een goed idee, ik denk dat je er inderdaad een soort matrix van kan maken. Met zo’n matrix keken we ook wel een keer welke inspecteur geschikt zou zijn voor een gebouw. Ja dus de duidelijkheid van het programma van eisen en de technologie. En als dat allemaal helemaal niet duidelijk is het misschien meer een haalbaarheidsstudie. Een dichtgespijkerd programma van eisen is denk ik minder geschikt is voor Agile”

[...] “Maar ik denk dat dit heel goed werkt. En dat je tijdens een soort startbespreking met de klant dit moet bespreken. Dat je de punten van de klant opschrijft en dan bijvoorbeeld concludeert, ik kan hier geen normale aanbieder doen. Ik beveel u agile aan. En we hebben verschillende betalingen varianten.”

[...] “Je doet hier dus ook beroep op zijn tijd natuurlijk he. En als hij zegt, ja dat wil ik, dan moet je misschien andere afspraken gaan maken of niet agile willen werken.”

3. Mist u iets? (of iets in deze fase)

D. Open vragen - pre-conditions

1. Wat vindt u van meer focus op ‘process’ en ‘relationships’ in plaats van ‘results’?

“Ik denk dat dit heel erg variabel is per opdrachtgever. Dus project specifiek. Dus soms heeft een opdrachtgever een miljoen en weet niet wat hij wilt, of de scope is vast en het geld maakt minder uit.

A. Scope

1. Step 1 t/m 4 - kunt u hiermee werken, ziet u voor- en/of nadelen?

“Ik ben continue naar raakvlakken naar hoe het nu gebeurt. Wat jij eigenlijk beschrijft is een soort prijsvraag. Dus een ontwerp van scratch. Je hebt het over een hele vrije ontwerpogave, dus het ontwerpen van een programma van eisen en vervolgens door. Veel mensen zijn niet gewent om hiermee te werken. Dus het zit hem erin om uit te leggen wat er anders is dan nu. Dus wat jij doet is dit in een contract gieten en dat is het unieke. Dat is wat er in mijn ogen nog niet bestaat.”

[...] “Wat hier gebeurt dat een opdrachtgever niet precies weet wat voor een brug hij precies weet wat hij wilt. Daarmee kan het meer out of the box zijn. Dus dat lijkt op een prijsvraag, dus dat is ook een fase wat wij nu kennen.”

[...] “Je moet ook zeker iets zeggen over het resultaat, dus of dat nou een brug is die van a naar b gaat of een vergunningsvraag. Elk proces leidt naar een stap in de vorm van een prijsaanvraag, vergunning, noem maar op. Ik denk dat je ook al is begin traject nog onduidelijk dat je het einddoel duidelijk moet omschrijven. Je gaat daarin niet alleen maar nieuwe dingen doen. Wat uniek is, is het proces daarheen. Dat is natuurlijk ook de moeilijkheid.” “Hoe beter je het resultaat kan beschrijven daar valt of staat het mee.”

Dus als je naar de MMP kijkt?

“Ja, dat is wat ik bedoel.” [...] “Daarbuiten zijn verwachting belangrijk!” [...] “Ik vind dat het opdelen in requirements nog te weinig gebeurt. Dat zal heel nuttig zijn, maar daar moet je aandacht voor hebben. Ook weer belangrijke taak van projectmanager”

2. Change management - ziet u hier voor- en/of nadelen in, en is dit toepasbaar in de praktijk?
“Het punt is in de bouw dat iedereen, dus gemeentes, aannemers, ontwikkelaars zitten vast aan VO, DO, bestek en UO, als je dat verandert of niet verwerkt dan, ja ik dank dat het belangrijk is dat je dat laat zien. Ik denk dat deze afhankelijk is of je voor een uur factuur gaat of optie 1 of 2. Voor welke vorm je gaat. Bij optie 3 doet dit eigenlijk niet zo terzaken. Voor 2, is dit relevant, maar voor 1 is dit noodzakelijk denk ik. Anders ga je natuurlijk heel erg nat.”

B. Financial provisions

1. Wat denkt u van deze drie voorstellen? (Bedenk: de keuze is project specifiek, niet persoon specifiek!)

“Vooral in het begin is dit misschien wat. Maar als je weet waar het heen gaat kan je het gewoon goed schatten. Als je niet weet waar het heen gaat is dit een veilige variant. Dus met meer onzekerheid is dit een veilige variant (optie 2).” [...] “Ik kan voorstellen dat je de klant deze voorstellen doet en dat de klant kiest” [...] “Optie drie lijkt me minder wat, want wat een klant in mijn ogen altijd wilt is een richtprijs, of een plafondbedrag. Je zal minder vaak tegenkomen dat hij zegt: ‘ga maar aan de slag en het maakt me niks uit wat het kost’. Dat is natuurlijk vrij zeldzaam.”

2. Kunt u met alle opties werken, ziet u bepaalde voor- en/of nadelen? Bijvoorbeeld:
“Ja, ik begrijp het. Je spreekt eigenlijk bij optie 1 en 2 van een soort richtprijs. En optie een uren contract met een plafondbedrag. Of wat ik net zei, dus dat je 1 op 1 uur verrekend. Maar dat je streeft naar 100 uur en als je eroverheen gaat je korting krijgt. Ja we werken wel eens zo. Ik zit minder in de financiële onderbouwing.

3. Wat vindt u van het idee van betaling sprint/fase om vertrouwen tussen partijen te bewerkstelligen?

“Ja, tuurlijk. Ja wat je normaal natuurlijk doet, je verteld wat het resultaat is en wat dat je verteld wat het gaat kosten. Maar hier is het uniek dat je relatie heel sterk moet zijn.”

C. Organizational

1. Denkt u dat de agile rollen en betrokkenheid van de klant contractueel zo goed is vastgelegd? Moet dit überhaupt om een goede samenwerking te bewerkstelligen?

“Maar wat hier uniek aan is dat de relatie erg sterk is, dus ik kan me heel goed gaat omschrijven wat in die relatie de rolverdeling is, en de verwachting qua informatie delen, dus wie trekt het project. En uit welke hoek komt die informatie. Vaak wordt het actief aangeboden. Verwacht je elke dag een meeting, om heb je dat 1 keer in de week.” [...] “Ik denk dat je inderdaad met dikke vette letters erin moet zetten hoe vaak en hoe intensief je de klant erbij wilt. Hij moet actief in het proces zitten. Dat is belangrijk en dat vreet tijd van hem. Het kost hem nu heel veel tijd en energie.”

[...] “Client critically involved in the team? Ja bij voorkeur weer wel. Bij een professionele klant zie ik dit ook, bijvoorbeeld XXX (grote klant van Arup). Die klant had er zelfs een speciaal team op, en die mensen gingen op in het team, trokken parallel met ons op en snapte ook wat wij deden. Maar bijvoorbeeld XXXX (eenmalig klein project) snapt dat niet.”

Denk je dat je dit soort dingen (client involvement) ook wilt vastleggen in een contract en tot welk detail, bijv per uur?

“Ja, jazeker, en dan zou ik het wel zo simpel mogelijk houden. Zeg dan dat de klant elke ochtend aanwezig moet zijn. Of via VC. En ik denk ook met uren. Want dan is het heel makkelijk wat je van een klant verwacht. Want je verwacht betrokkenheid, maar betrokkenheid, tja wat is dat. Is dat dat hij er

altijd bij is of in hoofdlijnen snapt wat er gebeurt. Ik kan me voorstellen dat je omschrijft dat je in het begin op gezette tijden afspreekt. En dan is die opmerking over 'postponed liability' zeker relevant. Want de klant wordt deel van het hele team."

[...] "Het aspect van multidisciplinaire teams hangt dan ook weer eens heel erg af van het soort opdracht dat we hebben. Er zijn ook opdrachten die niet verder gaan dan het inspecteren van een gebouw."

Maar dat is misschien ook niet geschikt voor agile?

"Nee dat klopt. Nee inderdaad bij voorkeur de projecten die geschikt zijn voor agile zijn die van het punt daarvoor (pre condititions)"

2. Welke mogelijke problemen voorziet u door deze afspraken?

D. General obligations

1. Denkt u dat de agile management methode zo goed naar voren komt? In hoeverre kunt/wilt u agile vastleggen in het contract, is dit voldoende?

"Ja daar zie ik absoluut iets in. Ik denk dat je dat altijd moet doen. Bij een niet nieuwe klant en wel een nieuw project heb je een voorbespreking. Ik kan me heel goed voorstellen dat je dan eerst die grafiek uit pre-condities gebruikt. Dat je opschrijft: 'dit wilt u hebben, focus op die en die punten, we hebben gestandaardiseerd aanpakken, (waterval) maar ook agile en we hebben dit afgezet in deze afspraken.' En natuurlijk bij zeggen dat het veel tijd vreet van de klant, maar het eindresultaat daar gaat het over."

Zou je dan ook daily standups en alle ceremonies erin vermelden, of zelfs heel extreem het AgilePM handboek erin opnemen?

"Persoonlijk zou niet het handboek erin zetten. Dan verplicht je een klant tot het opnemen van stof wat hij toch niet gaat doen. Alleen een professionele opdrachtgever van een heel groot project die er zelf ook in zit zou dat doen. Ik zou agile zeker benoemen, en dan zou ik onderdelen gaan beschrijven. Dus bijvoorbeeld concluderen dat je dagelijks bij elkaar moet komen of bijvoorbeeld 1 keer in de week, hangt van het project af. Een commitment. Een rolverdeling en verwachtingen. Die zijn aan elkaar verbonden. Dat soort componenten moet je zeker verwerken in het contract. Maar dan wel project specifiek. Geen algemene teksten en alles van te voren met iemand doornemen."

2. Welke mogelijke problemen voorziet u door deze afspraken?

"Jazeker. Maar er zijn hier natuurlijk ook project waar mensen maar 4 uurtjes per week aan besteden. Dus een daily meeting? Ja bij voorkeur zeker ja, maar de ene keer gebeurt het niet, de andere keer wel."

E. Decision-making

1. Wat vindt u van de test op het einde van een sprint? En dat het project pas door gaat als is voldaan aan de 'definition of done'.

a. Hoe kijkt u aan naar 'acceptance criteria' en 'test criteria'?

"Ja, dat is hier heel helder in, je zegt we gaan die sprint doorlopen en we zorgen dat we van te voren dat we die prioriteit maken en criteria. Dit alles als doel dat we niet uit de tijd en uit de kosten gaan lopen."

"Inderdaad goed dat alles visible moet zijn. Alleen je moet dat wel echt promoten. Rol van PM"

“En neem altijd de klant mee, dat is natuurlijk het principe van de daily meetings, dit is belangrijk voor de verwachtingen.”

2. Welke mogelijke problemen voorziet u door deze afspraken?

F. Liability

1. Wat vindt u van het idee van ‘postponed liability’?

“Ja absoluut, die moet je zeker vastleggen. Dat lijkt me heel goed. Ja helder. Wat zou helpen, maar dat zit hierachter zijn proces plaatjes. Want normaal gesproken is elk telefoontje dat je doet, daar hang je dan aan. ‘Je had gezegd dat’. Dus absoluut goed om vast te leggen.”

2. Is dit toepasbaar in de praktijk?

“Ja ik denk dat je bij de klant heel goed tussen de oren moet krijgen dat hij onderdeel is van het ontwerpproces. En dat we hem nodig hebben om tot het beste en meest efficiënte product te komen. En dat hij moet aangeven wat hij zelf wil. Doormiddel van de moscow prioriterizatie. En het is belangrijk dat hij dingen kan zeggen die nog onderzocht moeten worden. Dus een brainstorm sessie zeg maar.”

3. Welke mogelijke problemen voorziet u door deze afspraken?

G. Ownership and use of rights

1. Vindt u de twee opties duidelijk en logisch?
2. Welke mogelijke problemen voorziet u door deze afspraken?

“Dit is niet helemaal mijn afdeling, hiervoor moet je bij interviewee II zijn” (zie interviewee II)

H. Termination

1. Hoe vindt u de ‘termination’ van het hele project geregeld?
2. Hoe kijkt u tegen het idee aan van ‘early termination’?
3. Welke mogelijke problemen voorziet u door deze afspraken?

“Het risico is inderdaad dat je als ingenieurs bureau eerder klaar is. Ik snap je vraag maar ik zie het niet direct.”

I. Disputes

1. Welke mogelijke problemen voorziet u door deze afspraken?

E. Afsluiting

1. Zou dit contract ook toepasbaar zijn op een niet agile project?

“Ja, ik zie het meer als een groot grijs gebied. Je kan een honderd procent agile project hebben of een volledig traditioneel. Maar ik denk dat je er altijd tussenin zit. Dus het zou een mix zijn, custom made iets.”

2. Hebt u nog op- of aanmerkingen?

“Bij die vragenlijst over agile heb ik het nu gemiddeld in gevuld. Maar je zou moeten vragen hoe vaak iemand agile management. Doordat ik het nu gemiddeld heb ingevuld lijkt het erg traditioneel, maar het kan enorme deviaties hebben natuurlijk. Ook bij andere mensen.”

“Heel veel projecten zijn nu niet zo waternal zoals we misschien zouden willen denken. Er staat wel een stip op de horizon, dus bijvoorbeeld een vergunning maar de weg ernaartoe is wel agile.”

E.6 Expert interview – (agile) client V

A. General information

Interviewer	A.O. (Allard) de Stoppelaar
Interviewee	Jeroen
Date	21 december 2016
Time	09.15 – 11.00
Location	Arup Amsterdam
Question 1. Gender	Male
Question 2. Age	37
Question 3. Function and years of experience	Regio manager for 10 years (projectontwikkeling)
Question 4. Highest education	WO
Question 5. Field of education	Civil Engineer and Master City Developer
Question 6. Which kind of projects do you usually manage	
a. Kind of project?	Area development
b. Which sector?	Private and public sector
c. In terms of time?	> 12 months
d. In terms of money?	5.000.000 – 60.000.000 EUR
e. In terms of project phases?	All phases
Question 7. What kind of project management methodologies do you use?	PRINCE2, AGILEPM, Self-made (combination of methodologies)
Question 8. Agile Project Management?	
a. are you familiar with agile	Yes
b. do you have an agile certificate	Yes
c. do you use agile project management?	Yes
I. For what kind of projects?	ReGEN project
II. For what project phase(s)?	Feasibility and initiation

A. Questionnaire about agile

For the results of the questionnaire see chapter 5 of this thesis.

B. Open vragen - pre-conditions

I. Relationship between parties

1. Bent u het hiermee eens? Zo nee, waarom?

*“Ja vertrouwen is heel erg belangrijk. Volgens mij is een contract juist voor bedoelt om juist daar waar het vertrouwen wordt geschonden om terug te vallen op iets data vastligt. Dus, ik vind, voor samenwerken is vertrouwen erg belangrijk maar contract is juist voor mij een andere onderdeel van dient. Namelijk om een basis te hebben om met elkaar te werken als blijkt dat je dat niet op je blauwe ogen kunt doen. Dus hoe ga je er mee om als ik een contract sluit met een adviseur? Wat ik veel deed dat ik degene die mijn aanspreekpunt werd wilde kennen. En laten we eerlijk zijn het hangt ook een beetje af van de omvang van de opdracht. Voor mij mag de relatie neutraal zijn hij mag niet slecht zijn, maar hij mag ook neutraal zijn om bekend om een kleine te gunnen. Voor een grote opdracht niet. **Dus het is projectomvang afhankelijk**”*

Persoonlijk kennen?

Ik bedoel daarmee een keer ontmoeten is voldoende. Heel veel van de opdrachten gingen terug naar dezelfde partij omdat je daar goede ervaring mee hebt. Maar soms werd er ook heel bewust een

nieuwe partij uitgekozen om te kijken of de partij waarmee je werkte nog wel genoeg scherp in markt zat, dan wel om uit te vogelen welke partij waarvoor het beste was. Dit ging totaal arbitrair.

2. Legt u dit soort dingen nu contractueel vast?

“Nee. We hebben een keer een groot project uitgezet. Waarbij de adviseur een persoonlijkheid test aanbood. Om te kijken of er een klik zou zijn. Die test zei van wel, maar ik vond het een kwal. Dus we hebben toen ook niet voor hun gekozen.”

3. Mist u iets – weet u meer manieren om een relatie op te bouwen/wat doet u nu?

II. Check if a project is fit for agile

1. Bent u het hiermee eens? Zo nee, waarom?

a. Wie bepaalde de management method in een project?

“Wat ik meegaf was een budget, wat ik meegaf was een planning (indicaties) en ik ga een scope mee. Ik vond het fijn als ik een uren tarief kreeg en een inschatting. En als ik dit lees denk ik dat ik dat best zou willen proberen bij sommige projecten en dat ik er voor open ben om dit met een adviseur te doorlopen en dan moet die adviseur agile natuurlijk ook wel kennen.”

2. Legt u dit soort afspraken ook op dit moment contractueel vast? Zo ja, hoe? Zo nee, is dit volgens u mogelijk?

*“Nee, we moesten ook vaak de aanbestedingsregels van de gemeente volgen. **Maar ik zou als dit een goede methode lijkt, dan hoef ik hier niet een middag om te zitten. Maar ik wil een adviseur die het snapt. Dus je wilt een gesprek hoe je het gaat inrichten, hoe je het concreet maakt. Dus heel plat, geen theoretische exercitie.**”*

3. Mist u iets? (of iets in deze fase)

B. Open vragen - pre-conditions

1. Wat vindt u van meer focus op ‘process’ en ‘relationships’ in plaats van ‘results’?

“Nou kijk, ik heb vaak gewerkt aan stedenbouwkundige masterplannen. Hoe dat resultaat eruit komt te zien is een samenspel tussen heel veel verschillende opgave. Dus verkeerskundig, veiligheid en esthetisch moet het kloppen. Dat is iets waar je met elkaar aan moet werken. En dan vond ik je opmerking over de klant interessant. Want bij het grondbedrijf hadden we twee klanten. Intern verkochten we het door, aan de andere kant is het de gemeente en de bewoners (die ken je nog niet). Dus wie is de eindgebruiker in dit contract? Dat is een hele interessante vraag.”

“Dus je had heel veel stappen nodig, dus ook heel veel vinkjes. Het is interessant om te zien of je dat met een aantal sprints kan bewerkstelligen. Hoe ging dat nu? Schetsen overleg, schetsen, overleg, het ging weinig gestructureerd.”

*“**Dus om terug te gaan, het resultaat was een stedenbouwkundigplan en hoe je ernaar toe ging komen was vaag.** Kijk als bleek dat als uit een bodemonderzoek verontreiniging was, dan moest het park en de parkeerplaats misschien omgewisseld worden. Het eindresultaat was gewoon een volledig stedenbouwkundig plan.”*

Wie beoordeelde dat?

“Wij, en met randvoorwaarde dat de gemeente er ook mee kon stemmen.”

En terug naar de driehoek?

“Nou om hierop terug te komen is dat een situatie ontspoord als het resultaat vaag staat omschreven. En in dat soort gevallen waar te grote afstand ontstaat tussen opdrachtgever en opdrachtnemer, waardoor je niet meer goed op de hoogte bent van de stapjes die zet. Dan heb je die situatie eerder. Dus het aantrekkelijke van van agile is dat je veel intensiever samenwerkt en dat de frequentie van samenwerken hoger is waardoor je dat soort excessen eerder onder shot hebt. Dus ik denk dat het zowel voor de opdrachtnemer als geveer een stukje begrip kweekt, we zijn nu aan het eind van een sprint en we kunnen het wel of niet leveren als ook de opdrachtgever heel duidelijk wil weten welke stappen er worden gezet. Het project waar het ontspoorde is waarschijnlijk hard gewerkt maar te weinig interactie. Dus je wilt het in kleine stappen doen met veel interactie.”

A. Scope

1. Step 1 t/m 4 - kunt u hiermee werken, ziet u voor- en/of nadelen?

“Ja, dit zou in de praktijk kunnen helpen, maar het zijn wel lange trajecten. Je zou een sprint kunnen maken wanneer je input klaar hebt, bijvoorbeeld een bodem onderzoek. Dus je kan wel alles opknippen maar vergunningen moet je ook ergens kwijt. Dus je moet agile wel toesnijden op processen in de bouw. Dus misschien een paar keer een sprint en een paar keer pauze. Ik zou graag dat de andere partij met een voorstel komt.”

“Het project kreeg op een gegeven moment wel een soort ritme maar dat sudderde altijd wel een beetje door, er werd voor mijn gevoel nooit super strak op deadlines gemanaged. Wat bij sprints misschien beter kan.”

“Het gaat erom dat je vooraf je eisen hebt, zodat je sneller dingen onder shot krijgt, dus functionele eisen. Brug hoogte etc.”

2. Change management - ziet u hier voor- en/of nadelen in, en is dit toepasbaar in de praktijk?

“Hoe dit nu ging was dat als het bureau over zijn tijdging dat we zelf (als het goed was) wel aanvoelde dat er meerwerk zat aan te komen. Je komt er zelf pas achter als je meer vragen gaat stellen. Je moet checken of alles in verhouding is. Dan is die discussie niet zo heel lastig.”

3. Welke mogelijke problemen voorziet u door deze afspraken?

“Dingen zoals vergunningsaanvragen en onderzoeken etc.”

B. Financial provisions

1. Wat denkt u van deze drie voorstellen?

2. Kunt u met alle opties werken, ziet u bepaalde voor- en/of nadelen? Bijvoorbeeld:

“Optie 1, ja ik zou daar zeker mee kunnen werken. Ik denk dat je als opdrachtgever hier ook heel blij van wordt. Budget zekerheid is heel belangrijk. Het risico is dat de discussie zich verplaatst van prijs naar de scope.” “Nu heb je de discussie vaak achteraf over prijs, en dan denk ik wat je krijgt.” “Risico is in mijn ogen groter voor de opdrachtnemer.”

“Optie 2, met aannemers heb ik wel eens zo gewerkt, met bonus malus, maar dan wel altijd met een bandbreedte. Wat is je maximale winst en wat is je maximale verlies. Met een adviseur niet, dat heeft ook te maken met de beschrijving van je product. Dus dat is waar we het net over hadden. Je moet die sprints heel goed definiëren, er is dan veel meer nodig aan de voorkant, terwijl ik er wel in geloof.”

“kan je dit nog even uitzoeken en kan je dat nog even uitzoeken, ik vind dat daar beter over is nagedacht in dit type contracten.”

“Het gaat hier ook weer over vertrouwen en transparantie.” “Denk ook aan een inschatting met een plafond.”

3. Wat vindt u van het idee van betaling sprint/fase om vertrouwen tussen partijen te bewerkstelligen?
4. Mist u iets?

C. Organizational

1. Denkt u dat de agile rollen en betrokkenheid van de klant contractueel zo goed is vastgelegd? Moet dit überhaupt om een goede samenwerking te bewerkstelligen?
2. Welke mogelijke problemen voorziet u door deze afspraken?

“Ja hier zie ik wel iets in. Maar er zijn twee dingen waar ik op zou letten in de bouw. Wat ik net zei, het kan best wel negen maanden duren, en agile heeft de neiging om super intensief over een korte periode te werken. Dus zou niet een soort pauzes in moeten bouwen. Twee, als je dit gaat doen, dat is misschien arrogantie van de opdrachtgever, dat het ingenieursbureau maar bij ons op bureau moet komen. En dat is niet zo gebruikelijk. En ik weet niet precies waarom dat gek zou aanvoelen, ik denk dat komt omdat je allemaal in de bouw meerdere projecten aan t doen bent. Dus meer praktisch probleem. De vraag is of je een soort slow pace agile kan doen.”

D. General obligations

1. Denkt u dat de agile management methode zo goed naar voren komt? In hoeverre kunt/wilt u agile vastleggen in het contract, is dit voldoende?
2. Welke mogelijke problemen voorziet u door deze afspraken?

“Ga je het hele team laten overkomen, of misschien kan je VC gebruiken. Maar ik zou bereid zijn om het contractueel vast te leggen. Ik denk wel dat deze manier van samenwerken heel veel toegevoegde waarde heeft. Wat interessant is om te zien, ‘nou jongens dit gebeurt er nou achter de muur van een ingenieursbureau’. Als opdrachtgever zou je daar maar 1 man op hoeven te zetten.”

“Maar het is vooral in de hoofden van de mensen”

E. Decision-making

1. Wat vindt u van de test op het einde van een sprint? En dat het project pas door gaat als is voldaan aan de ‘definition of done’.
2. Welke mogelijke problemen voorziet u door deze afspraken?

F. Liability

1. Wat vindt u van het idee van ‘postponed liability’?
2. Is dit toepasbaar in de praktijk?
3. Welke mogelijke problemen voorziet u door deze afspraken?

“Ik zie er juist alleen maar voordelen in. Het voelt misschien contra-intuïtief. Dat komt door hoe we al die jaren hebben gehanteerd in de bouw. Dat terugkomen op een afspraak fout is. Maar als je daarover nadenk is dat best wel gek.”

“Ik denk dat het juist heel krachtig is, dus dat je kan sparren. En ook dat je andere richtingen op kan gaan. Het lijkt mij juist een heel mooi concept. Het is namelijk heel vaak een zoektocht naar welke keuze moet je nou uiteindelijk maken. Daar kan je als opdrachtgever ook helpen, met een struggle. Anders mis je misschien kansen”

G. Ownership and use of rights

1. Vindt u de twee opties duidelijk en logisch?
2. Welke mogelijke problemen voorziet u door deze afspraken?

“Als projectontwikkelaar schrijf je die altijd naar jezelf toe en daar zie ik eerlijk gezegd niet verandering in komen.”

“als project ontwikkelaar ben je niet opzoek naar nieuwe uitvindingen etc.”

H. Termination

1. Hoe vindt u de ‘termination’ van het hele project geregeld?
2. Hoe kijkt u tegen het idee aan van ‘early termination’?
3. Welke mogelijke problemen voorziet u door deze afspraken?

I. Disputes

1. Welke mogelijke problemen voorziet u door deze afspraken?

C. Afsluiting

1. Zou dit contract ook toepasbaar zijn op een niet agile project?

“De hoofdstukken wel. Voor mij, waar het dit zich in onderscheid is dat je met deze aanpak aan de voorkant veel beter nadenkt wat voor een dingen je in kleine stapjes gaat ontwikkelen. En dat je dus een betere interactie krijgt tussen opdrachtgever en opdrachtnemer. En dat is wat we missen in de PMBOK en Twynstra verhalen waar je vooraf net zo vaag als hier het eindproduct omschrijft en dat wel ziet hoe je er komt door gedurende de rit uiteraard af te stemmen met elkaar, of discussies te hebben etc. De kracht hiervan is dat je dat vooraf probeert vast te leggen waardoor je meer handvatten hebt om intensiever samen te werken.”

“Waar ik hier zorgen over heb is de intensiteit die wordt voorgesteld of je die kan halen in een bouwproject. Wat ik net zei, elke dag meetings. Maar uiteraard heb je tegenwoordig VC en moet je misschien de knop omzetten. Dus het is vooral de implementatie om op die manier te werken. En dan nog als wat ik zei, kan je zo lang weg zijn (vergunningaanvraag o.i.d.). Dus moet je 3 weken sprint, 2 weken rust, 3 weken sprint, 2 weken rust om het vol te houden. Ik denk dat je daarvoor gewoon met elkaar moet toepassen om het juiste ritme te vinden in deze manier van werken. Dus jazeker veel van deze dingen komen terug. Maar vooral de interactie en de betrokkenheid van de opdrachtgever in het hele proces vind ik een significant een andere werkwijze dan momenteel wordt gehanteerd. En ik zie daar zeker ook wel de voordelen van in.”

2. Hebt u nog op- of aanmerkingen?
3. Prefereert u privacy?
4. Dank.

E.7 Expert interview – (agile) client VI

A. General information

Interviewer	A.O. (Allard) de Stoppelaar
Interviewee	Marnix
Date	03-01-2017
Time	15.00-16.30
Location	Synchroon Zoetermeer

Question 1. Gender	Male
Question 2. Age	42
Question 3. Function and years of experience	Project ontwikkelaar, 15 years
Question 4. Highest education	WO
Question 5. Field of education	Business
Question 6. Which kind of projects do you usually manage	
a. Kind of project?	Buildings
b. Which sector?	Private sector
c. In terms of time?	15 months
d. In terms of money?	10.000.000 EUR
e. In terms of project phases?	Initiation and Design
Question 7. What kind of project management methodologies do you use?	-
Question 8. Agile Project Management?	
a. are you familiar with agile	Yes
b. do you have an agile certificate	No
c. do you use agile project management?	Yes
I. For what kind of projects?	-
II. For what project phase(s)?	-

A. Questionnaire about agile

For the results of the questionnaire see chapter 5 of this thesis.

B. Open vragen - pre-conditions

I. Relationship between parties

1. Bent u het hiermee eens? Zo nee, waarom?
 - a. Voorspelt u dat dit problemen oplevert?
2. Legt u dit soort dingen nu contractueel vast?

“Nou dit gaat nu natuurlijk veel vanuit voorgaande ervaringen. Je gaat nu niet een dag met elkaar zitten, dat ligt wel weer van de mensen af. Je kijkt naar de soort mensen, naar wat ze hebben gedaan. Soms krijg je ook tips via je connecties of collega’s. Ja, dus het gaat nu heel erg op basis van mond en mond reclame, ervaring en ervaring vanuit andere.”

“De keer dat ik met Arup hebt gewerkt zijn altijd tenders geweest. We hebben IJburg gedaan. Ook bij Sluyshuis, ook omdat Arup goede referenties heeft. Dat is ook de manier waarop je selecteert. Dus op basis van andere projecten, daarvoor was het op basis van andere projecten. Arup is een goede club met goede referenties. Ik kan me voorstellen dat als je een meer onderzoekend, agile, proces hebt dat je dat meer doet met een bedrijf waar je eerder mee hebt samengewerkt. Vaak vraag je ook nog even rond. Zo gaat het nu ook heel erg. Zo selecteren we ook voor die tenders.”

II. Check if a project is fit for agile

1. Bent u het hiermee eens? Zo nee, waarom?
2. Legt u dit soort afspraken ook op dit moment contractueel vast? Zo ja, hoe? Zo nee, is dit volgens u mogelijk?

“Nee, het gebeurt nu niet heel expliciet. Zeker niet als je al wat ervaring hebt. Maar ik denk, zonder ervaring is het zeker nuttig. Het is uiteraard altijd makkelijker als je ervaring hebt. Wat we doen met een tender dat we elke week of om de week bij elkaar zitten. Dus met het ontwerpteam, architect en ontwikkelaar, dus dat is wel heel integraal. En dan bespreek je wel wat er uitgezocht moet worden.”

B. Open vragen - Contract

1. Wat vindt u van meer focus op ‘process’ en ‘relationships’ in plaats van ‘results’?

“Wij zijn al niet zo heel formeel, maar dat ligt ook misschien aan de grote van de projecten. Dus prijs zetten we vast en het doel.”

A. Scope

1. Step 1 t/m 4 - kunt u hiermee werken, ziet u voor- en/of nadelen?
 - a. Wat vind u van de stap 1 tot en met 4?
 - b. Wat vindt u van de details zo laat mogelijk bepalen: ‘respond at the last responsible moment’?
2. Change management - ziet u hier voor- en/of nadelen in, en is dit toepasbaar in de praktijk?
 - a. Worden de ‘scope changes’ zo goed gefaciliteerd door het contract?

“Ja, ik zou wel kleinere stappen willen zien. Wat wij bijvoorbeeld bij zo’n tender doen is dat we wel ongeveer weten wat we moeten inleveren. De output. Dus in die zin is het wel een proces zoals jij het nu beschrijft. Dus er moet bijvoorbeeld 20.000 vierkante meter uitkomen, levendig, nautische uitstraling, het moet iets voor de buurt doen, dus de gemeente geeft dat mee. Dan probeer je een team te formuleren en willen we dat gaan invullen. Arup doet nu daarin de duurzaamheid en constructie. Dus dan schatten we de uren in en wat we moeten inleveren.”

B. Financial provisions

1. Wat denkt u van deze drie voorstellen? (Bedenk: de keuze is project specifiek, niet persoon specifiek!)

2. Kunt u met alle opties werken, ziet u bepaalde voor- en/of nadelen? Bijvoorbeeld:

“Ik zit te denken. Wat we nu bijvoorbeeld bij een tender doen is ‘lump sum’ met een kicker als je wint voor alle partijen.”

“Je wilt natuurlijk ook nog een soort spanningsveld in. Het mag niet als de uren op zijn dat het in 1 keer stopt. De uitkomst moet gewoon goed zijn. Desnoods ben ik bereid nog meer te betalen. Er zit natuurlijk ook redelijkheid en billijkheid in. Als het nooit goed gaat, tja.”

3. Wat vindt u van het idee van betaling sprint/fase om vertrouwen tussen partijen te bewerkstelligen?

“Ja, zou kunnen, zou kunnen.”

4. Mist u iets?

C. Organizational

1. Denkt u dat de agile rollen en betrokkenheid van de klant contractueel zo goed is vastgelegd? Moet dit überhaupt om een goede samenwerking te bewerkstelligen?

“Nou, zeker als het over technische dingen gaat zit ik er niet dag tot dag op te wachten. Ik verwacht ook wel dat een project manager of partij het proces kan overzien. 1 keer per week kan wel, ongeveer 2 uur. Ik verwacht van partijen dat ze informatie leveren die jij niet weet. Ik heb de uitvraag in gedachte en daar stuur ik op.”

“Ja, nou een organogram kan wel, dat hebben we nu niet. Per partij maken we nu de afspraken. Per onderdeel gaat het eigenlijk nu.”

2. Welke mogelijke problemen voorziet u door deze afspraken?

D. General obligations

1. Denkt u dat de agile management methode zo goed naar voren komt? In hoeverre kunt/wilt u agile vastleggen in het contract, is dit voldoende?

“Ja, ik denk dat het wel goed is om vast te leggen.”

2. Welke mogelijke problemen voorziet u door deze afspraken?

E. Decision-making

1. Wat vindt u van de test op het einde van een sprint? En dat het project pas door gaat als is voldaan aan de ‘definition of done’.

2. Welke mogelijke problemen voorziet u door deze afspraken?

F. Liability

1. Wat vindt u van het idee van ‘postponed liability’?

2. Is dit toepasbaar in de praktijk?

“Ja, je wilt natuurlijk een vertrouwde omgeving. Ja zo werken wij wel. Het gaat om de creativiteit. Het is goed in een proces dat hij zich kan uitspreken. Wij weten wel dat we het risico uiteindelijk lopen, in ieder geval over het grotere deel.”

“Dus nu gebeurt dit eigenlijk bij ons al, maar hebben we het niet vastgelegd.”

3. Welke mogelijke problemen voorziet u door deze afspraken?

“Let misschien ook op het bijverzekeren.”

G. Ownership and use of rights

1. Vindt u de twee opties duidelijk en logisch?

“Tja, de DNR is natuurlijk een contract wat dienstverleners zelf voorleggen. Dus heel vaak sluiten we die artikelen uit. Dat hebben we al gestandaardiseerd. We claimen nu niet per se alles. Maar ik het is nu wel heel erg vanuit de dienstverleners.”

2. Welke mogelijke problemen voorziet u door deze afspraken?

H. Termination

1. Hoe vindt u de ‘termination’ van het hele project geregeld?

2. Hoe kijkt u tegen het idee aan van ‘early termination’?

3. Welke mogelijke problemen voorziet u door deze afspraken?

I. Disputes

1. Welke mogelijke problemen voorziet u door deze afspraken?

C. Afsluiting

1. Zou dit contract ook toepasbaar zijn op een niet agile project?
2. Hebt u nog op- of aanmerkingen?

“Tenders zijn denk ik wel vergelijkbaar, snelkookpannen waar veel creativiteit bij nodig is. Kijk het gaat ook niet over tonnen of miljoenen. Als je wint dan gaat het pas echt gebeuren. Dus in voorfase valt het wel mee.”

Ben je daardoor ook lossier in je contract?

“Ja, hebt dan geen zin om maanden te onderhandelen, je hebt er dan niet de tijd niet voor. Als zo’n tender komt is snelheid belangrijker dan de laatste euro. Je wilt niet inderdaad in detail alles uitwerken, je wilt gewoon snel winnen. Als je hebt gewonnen begint de echte contract onderhandeling.”

F. Proposal for an Agile Contract

| See next page |

Proposal for an Agile Contract

Agile contracting between Client and Supplier (Architect, Engineer and Consultant) for the front-end development (initiation and design) in the construction industry



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Proposal for an Agile Contract

The following document contains recommendations to effectively enable agile project management through contracting for the front-end development (initiation and design phase) in the construction industry. The proposal consists of two sections:

1) Proposal for an Agile Contract

This section contains recommendations to effectively enable agile project management in a construction contract based on the DNR 2011. It should be mentioned that because these recommendations are designed for agile contracts, does not automatically mean they are not applicable to conventional contracts. However, these recommendations allow and enable an agile project management approach.

2) Modifications to *The New Rules 2011 (DNR 2011)*

This section contains all articles and clauses of the DNR 2011 that have to be added, amended, or deleted in order to effectively enable agile project management according to the recommendations of the previous section.

This document is the result of a master thesis. Therefore all the background information of this proposal can be found in the master thesis: *Towards Agile Contracting*. Information about this thesis can be found on this page.

Thesis

Towards Agile Contracting

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Pre-conditions

First – before signing an agile contract - the following two aspects must be in order.

1. Relationship between parties

Parties should check if there is a basis for a fruitful relation: mutual trust is key. If there is no mutual trust, parties risk that the contract is used as a coercive measure to get what they want and a mechanism to settle liabilities. Instead, the contract should be a reflection of a good relationship and help to create a successful project.

However, no specific agile roadmap exists to create a proper relationship from nowhere. Reputation and past experience with parties can help (the decision) to start a project. If this information is not available, it is recommended to start with only one sprint: a pilot sprint to test the relationship. Additionally, an agile approach helps stimulating and maintaining a good relation through:

- *Constantly creating results* due to *sprints*: the client and the supplier see result on a regular basis (see aspect D, p.4).
- *Full transparency* should enhance *trust* between both parties. This can be achieved with tools such as *burn down charts*; *Scrum boards*; *actively and visibly sharing all information* on a daily basis; and a *no blame culture* due to *moments of postponed-liability* (see aspect F., p.7).
- *Critical involvement of the client*; the client (representative) is part of the development team. Therefore the client gets a better understanding of the project (and the struggles) (see aspects C, D & E, p.6 for the exact role of the client).

Furthermore, the contract contains agreements like: (1) confidentiality; (2) the availability of necessary technical and agile knowledge; and (3) commitment to conduct the services to the best knowledge and capacity (DNR 2011, article 11, clause 1, 2).

2. Fit for agile

Before starting an agile project, the merits and risks of an agile versus a waterfall approach must be considered. Project should not be managed agile only because clients want 'agile projects'. Decide which management approach is most appropriate in light of:

(1) The project: Agile project management is best applicable to complicated and complex projects (figure 1). This complexity is measured by 'what do we want' (requirements) and 'how do we do it' (technology). These conditions often apply to the front-end development phase of a project, which is also the scope of this contract.

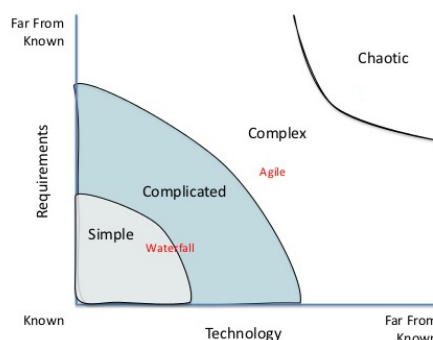


Figure 1. (Based on the Stacey Matrix)

(2) The culture and organization of both parties. The commitment of all team members to agile development should be checked. This can be done during a mutual kick-off (workshop) or even with a questionnaire about agile development before the start of the project.

(3) The availability of resources. Both parties should realize that agile requires sometimes different or even additional resources like: more experienced people, intensive involvement of all team members, multidisciplinary teams, co-working, and other agile principles (see aspects C, D & E, p.6).

Contract

An agile contract has another focus than most conventional contracts because it deals with an evolving scope. Therefore, the focus shifts from defining detailed end-results to defining processes. As a result, an agile contract defines how parties will get to the end-result, rather than the end-result itself. The end-results evolves during the project. In the test below, an agile contractual approach will be defined per contractual aspect.

A. Scope

Settle on the details during the course of the project. Contracts must allow suppliers to develop solutions iteratively and settle on details incrementally. Not everything should be written down to the smallest detail. This method can help minimizing risk: decisions are made when more information is available (*'at the last responsible moment'*). Commitment of both parties should be for the *functionality* and *amount of output* rather than the detail of the output.

The steps below define how to create the initial scope. These steps should be taken by both parties together and the outcome is part of the contract. This can be done during a workshop with a non-biased person facilitating this workshop.

Step 1

Client and supplier define a *vision* together. The vision describes the business value of the project for the client.

Step 2

Client and supplier define the *Minimum Marketable Product (MMP)*¹. The MMP is the end-product with just enough functionality to achieve the minimal business value required.

Step 3

Client and supplier define *outcomes/features*, rather than pre-defined specifications. These are defined as *'Statements Of Target Outcomes'* (SOTO's) or *product features* (user stories) which are delivered in sprints². These features are initially not described in detail. The details, acceptance criteria and test criteria of each feature are defined just before the start of each sprint.

Step 4

Client and supplier must include an *initial prioritization of the features* (in the Product Backlog³), this is guaranteeing that features with highest priority are delivered first.

Change management

The *'change for free'* principle should be incorporated: before the start of each sprint features may be exchanged (if technically possible) and priorities may be adjusted, as long as the total size of the project (time and cost) remains equal. These scope changes must be documented. This can be done by adding an addendum to the contract, or just by the minutes of meetings/workshops. As long as both parties agree unanimously on it (if this fails, see H. Disputes). The last made agreements prevail over the previous agreements. This way the scope (and the contract) evolves during the project. **However, sprints cannot be changed after they have started.** (See figure 2 on the next page for a visualization of the scope description and change management)

¹ The *Minimum Marketable Product (MMP)* is the smallest set of functionality that provides value to the market.

² A *sprint* is the equivalent of an *increment*, the first term is used in *Scrum* while the latter is used in *AgilePM*.

³ *Product backlog* is the equivalent of a *Prioritized Requirement List (PRL)*, the first term is used in *Scrum* while the latter is used in *AgilePM*.

	Scope	Time	Cost
Minimal Marketable Product	Requirements X and X	200 hours	20,000 EUR
	Requirement X	100 hours	10,000 EUR
	Requirements X	200 hours	20,000 EUR
	Requirements X and X and X	300 hours	30,000 EUR
	Requirements X	300 hours	30,000 EUR
Preferred scope	Requirements X and X	200 hours	20,000 EUR
	Requirements X	50 hours	5,000 EUR
	Requirements X	100 hours	10,000 EUR
Total contract:		1450 hours	145,000 EUR

Figure 2. Template for the description of the detailed scope (step 3, see scope description) (own illustration).

	Scope	Time	Cost	
Minimal Marketable Product	Requirements X and X	200 hours	20,000 EUR	FIXED SCOPE
	Requirement X	130 hours	13,000 EUR	
	Requirements X	170 hours	17,000 EUR	
Preferred scope	Requirements X and X and X	300 hours	30,000 EUR	VARIABLE SCOPE
	Requirements X	330 hours	33,000 EUR	
	Requirements X and X	320 hours	32,000 EUR	
	Requirements X	50 hours	5,000 EUR	
Total contract:		1450 hours	145,000 EUR	

Current point in time (indicated by a horizontal line above the Variable Scope section)

Expected final-product (within the initial time and costs) (indicated by a horizontal line below the Variable Scope section)

Expected not to be delivered at this point in time within the initial time and cost (indicated by a red box around the bottom row of the Variable Scope section)

Possible to change requirement x with x, and to reprioritize existing requirements (indicated by a vertical double-headed arrow between the top and bottom rows of the Variable Scope section)

Figure 3. Template for the progress reporting and change management in the case of fixed price option 1, see next page (own illustration).

B. Financial provisions

This proposal recommends to keep the scope flexible and fix time and cost in order to keep control over the project. It is reasonable for a client to expect a fixed price for a project. Clients often have a budget and want to maximize the benefit (business value). As said before, payment per sprint can be an option when a relationship between parties is not yet established. This way, with limited risk, parties can investigate if the collaboration has a good potential.

Two agile fixed price options are given:

1. Fixed price, fixed time, variable scope with fixed quality (optional: per sprint/phase)

This option consist of: fixed costs, fixed time and variable scope – with *fixed quality*. Fixed quality implies: it is agreed that at least (e.g.: 60%⁴) of the features is completed at the end of the project (this 60% represents the MMP). Due to the prioritization it is ensured that this only will be features that have the highest priority to ensure the best quality outcome is reached (for the available time and cost). The other (40%⁴) can be seen as *contingency*.

2. Target fixed price with a shared pain/gain model (optional: per sprint/phase)

This can be seen as a hybrid pain/gain model. This model translates the extensive agile collaboration to the pricing system. Together client and supplier define their common assumptions in terms of scope, cost and time. After each sprint and after project completion the client and supplier compare the results with their initial assumptions (checked by an unbiased party). Both parties will share the risk: the additional savings or expenses will be divided between both parties. The allocation of these expenses should be settled at the beginning of the project.

In certain project costs do matter less, or sometimes parties already work together for a long time and have built a great relationship and trust. In these cases reimbursable contract can be an option.

3. Reimbursable contract

The supplier is paid for all of its allowed expenses plus an additional payment to allow for a profit.

C. Organizational

The client should reserve enough resources to be involved in a proper manner. In comparison to conventional project management⁵ clients have more and greater responsibilities. Clients are on a daily/weekly basis involved in the project. This participation is critical for success in agile projects. Similarly, suppliers must realize that their role is different compared to conventional project management.

- I. **An organisational schema and all the agile roles are added in the contract.** This depends on the specific agile tool used.
 - No matter what agile tool is used: **the client must appoint a *client representative* that will be part of the development team.** This person must be *empowered to take decisions* on behalf of the client. This person must be involved in all agile ceremonies like: sprint planning, daily stand ups, sprint reviews and retrospectives⁶.
- II. **The supplier works with *self-organizing teams* that contain *all necessary skills and disciplines* for the project.**
 - **Teams are co-located.** A shared workplace should be established, also when more parties are involved in the project. The location should be incorporated in the contract.
 - **VC meetings can be a solution when it is impossible to work co-located,** however it is emphasized that co-located face to face communication is strongly preferred.

⁴ This 60/40 percent role is derived from AgilePM (DSDM, 2015, p.50, 51), however also other percentages can be agreed upon.

⁵ *Conventional project management* refers to management methods such as *PRINCE2* and *PMBOK*.

⁶ *Retrospectives* are done at the end of a sprint and helps the team understand what worked well and what didn't.

D. General obligations

- I. **Both parties choose a specific agile tool to manage the project** (e.g.: Scrum, AgilePM or a combination of such). **Both parties must assure that all necessary knowledge and capacity for an agile approach is available.** Together parties can decide on how to follow these specific guidelines.
- II. **Parties keep all data confidential, insofar parties can reasonably know or should know that this data is confidential** (DNR article 11, clause 1b).
- III. **Parties must conduct services to their best of knowledge, in respect to the four agile values** (see agile manifesto). The agile nature of the contract is no excuse for unorganized or unstructured work.
- IV. **The supplier must show control over the project, this is done by *monitoring and providing transparency*** (also see V).
 - I. The supplier must use and update tools like *Burndown charts* and *Scrum boards* on a daily/weekly basis.
- V. **Both parties should provide full transparency.** The supplier should involve the client in the development of the solution. This way the client gets a better understanding of the project and its difficulties.
 - Involve all stakeholder, not only the client but also the end user(s).
 - Communication should go further than only providing information. Parties must *actively communicate*⁷.
 - All information should be available and visible, this includes complications of the project. This should be done with *prototyping*.
 - Use of *face to face communication*.

E. Decision-making

- I. **Before the start of each *sprint/increment* client and supplier should define a *definition of ready***⁸ **together:** This entails: *detailed specifications, acceptance criteria, and test criteria*. These criteria form the boundaries of the '*Definition of Done*' (DoD).
- II. **At the end of each sprint the results will be reviewed. Before moving to the next sprint, the completion has to be confirmed by the client representative. These can be seen as a *checkpoint or milestone* in the project. After the review the next sprint can start.** At least the framework for acceptance and testing must be contractually clear. The acceptance test is passed when the acceptance criteria are met and there are no qualified errors. Qualified errors are errors that reduce the utility for the customer and that cannot be said to be unimportant. This must be decided by the client and supplier unanimously (if this fails, see I. Disputes). Another option is to outsource this to a non-biased third party. If this does not satisfy *acceptance criteria*⁹ and *test criteria* which are agreed upon at the start of the sprint, the supplier must improve the result until it meets the agreed criteria.
- III. **The client and the supplier provide *feedback* after each sprint.** This is feedback about the process and the results that are delivered. After each sprint they strive to improve the process and work more efficiently.

F. Liability

Both parties are able to discuss everything freely without being liable for the shown data and statements during sprints. But, results which are presented during the closure of the sprint is governed by the same liability clauses as in the DNR 2011 (chapter 6, article 13-18, DNR 2011). We call this: *postponed liability*.

⁷ *Actively communicate* goes beyond just providing the information to each other (Stephanie Gulijk, 2010, p.4).

⁸ *Definition of ready* means that the requirement is immediate actionable. The team needs this information to know what needs to be done and how much time this is going to take.

⁹ Reminder: *acceptance criteria* may concern aspects such as *functionality, aesthetics, documentation, interfaces and integration*.

G. Ownership and use of rights

The supplier should realize that there is a big influence from the client side. Therefore it is important the supplier (and the client) provide as much transparency as possible. Yet, the supplier should keep the 'know how'. Two options are given:

(1) In case of large, complex projects: alter the agreement about the ownership and use of rights to the project.

(2) Repetitive smaller projects: ownership and use of rights will be the same as in the DNR 2011 (chapter 11, article 45-48, DNR 2011). However,

H. Termination of the project

The entire project is done when the *project vision* and enough *business value* is achieved. This is judged by the client in consultation with the supplier (the client decides, the supplier only advises).

Moreover it must be possible to terminate the project without reason: one of the ideas of agile is that the client must be able to terminate the project after each iteration. This can cause problems for the supplier and client:

- If the client cancels the project, then the client must reimburse a predefined percentage of the remaining part of the costs (e.g.: 10 percent (DNR 2011 article 33, clause 2) of the remaining budget to the supplier.
- If the supplier cancels the project, then the client can deduct a predefined percentage from the sum that he owes the supplier (e.g.: 10 percent DNR 2011 article 33, clause 2).

Cancellation with a reason is described in the DNR 2011, article 39 and 41.

I. Disputes

Client and supplier must always act according to the standards of reasonableness and fairness. Disputes and escalations will be solved as amicably as possible (see the DNR chapter 13, article 58).

Additional note

In the case that parties find it hard to monitor these agile contractual recommendations, it is proposed that an external company helps to evaluate the agile processes of both parties. This company will assess if parties comply with the agile way of working that is agreed in the contract.

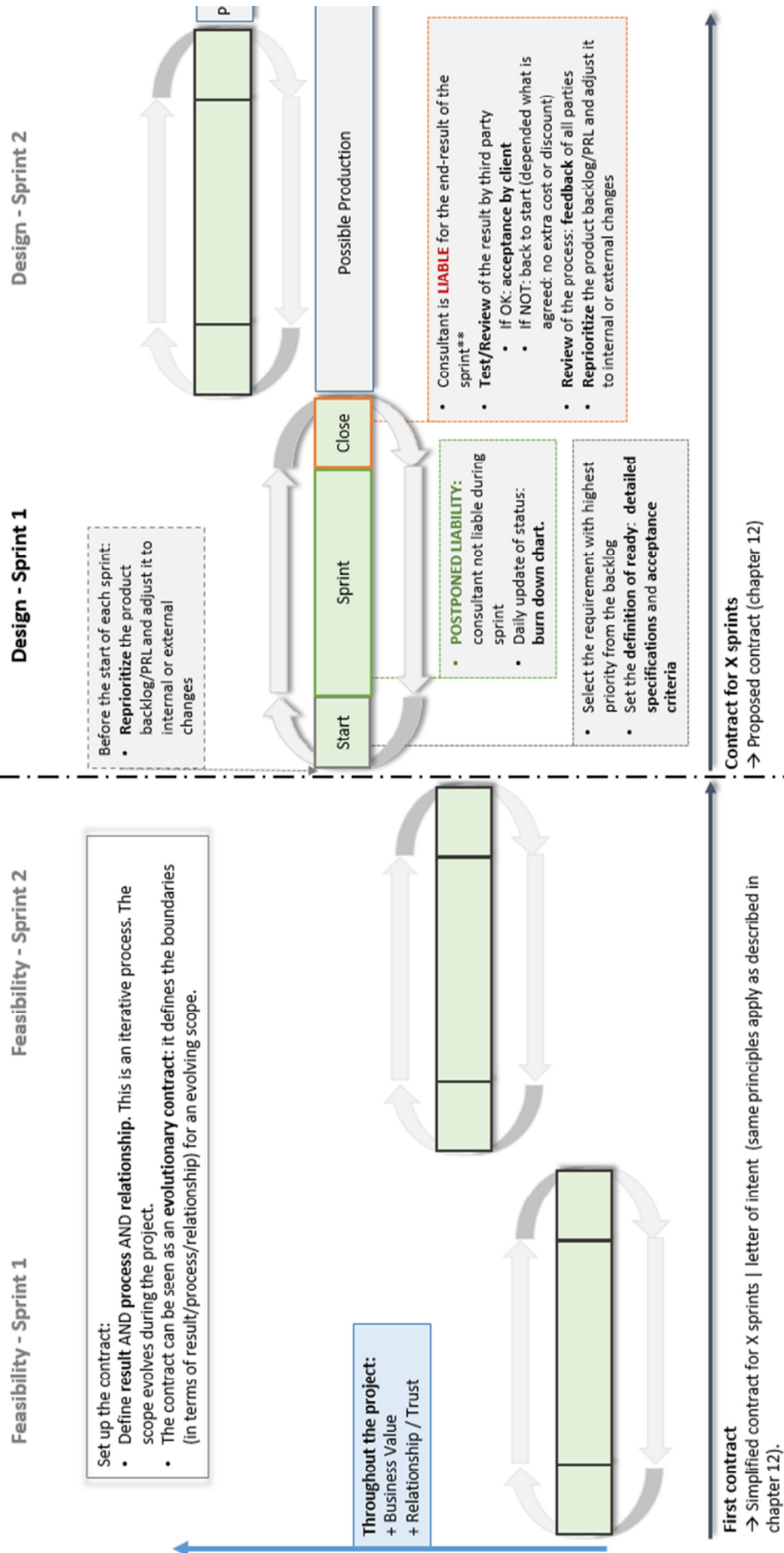


Figure 4. Visualization of an agile contract (own illustration).

DNR 2011: Agile Modifications

In the table below only the articles and clauses are shown that have to be amended, deleted or added in order to let The New Rules 2011 (DNR 2011) comply with the recommendations of the previous section.

Article / Clause	Add, Amend, Delete	Description of the alteration
Chapter 1 – Definitions		
Chapter 2 – General provisions with respect to the commission		
Article 2, clause 3, sub a	amend	<p><u>Add</u>: The content and scope must be defined in a manner which suits an agile way of working. It must be possible that the content and scope evolves during the project. As a result, the commission is only described in functional requirements (preferably in user stories).</p> <p><u>Add</u>: The scope is described as follows, this is done by BOTH parties:</p> <ol style="list-style-type: none"> (1) Description of the vision of the project. The vision represents the business value of the project for the client. (2) Description of the Minimum Marketable Product (MMP). The MMP is the product with just enough functionality to achieve the minimal business value and should minimally be delivered by the consultant¹⁰ (in the case of a fixed price contract). (3) The whole scope is described in functional requirements: the feature list (product backlog or prioritized requirement list). This list must be prioritized by business value (if this is technical possible). Future features can be exchanges (see chapter 4 in this table). <p><i>For a visualization of the scope description see figure 3 and 4 in the previous section.</i></p>
Article 2, clause 3, sub b	amend	<p><u>Add</u>: All data should be shared actively. The client should not only provide the information but <i>actively update</i> the consultant. Data should be constantly be available in a visible manner. Missing data must be provide within an agreed timespan.</p>
Article 2, clause 3, sub e	amend	<p><u>Add</u>: <i>Sprints</i>¹¹ should be built-in the phasing of the project. This means that the requirements (article 2, clause 3, sub a), which together describe the total scope, are planned into sprints.</p> <p><u>Add</u>: The planning should follow the prioritization of the product backlog or prioritized requirement list.</p> <p><u>Add</u>: The phasing of the specific agile tool that is used should be included. (E.g. in the case of AgilePM: pre-project, feasibility, foundation, evolutionary development, deployment, post project.)</p>
Article 2, clause 3, sub g	amend	<p><u>Adjust</u>: The client must appoint a <i>client representative</i> that will be part of the development team.</p>

¹⁰ Where in this thesis the term ‘supplier’ is used, in this table the term ‘consultant’ is used. This is because the DNR 2011 uses this latter term. Both refers to architect, consultant and engineer.

¹¹ Sprint can also be referred to as an increment, this terminology depends on the agile tool that is used.

		<p><u>Add</u>: The client representative must attend and participate in agile ceremonies (e.g. daily meetings) (see article 12, clause 5)..</p> <p><u>Add</u>: The client representative must be <i>empowered to take decisions</i> on behalf of the client.</p>
Article 2, clause 3, sub i	amend	<p><u>Add</u>: Quality assurance takes place at the end of each sprint. Before the start of each sprint, client and consultant should agree upon a set of <i>acceptance</i> and <i>test criteria</i>. At least the framework for acceptance and testing must be contractually clear. These criteria may concern <i>functionality, aesthetics, documentation, interfaces</i> and <i>integration</i>. The acceptance test is passed when there are no qualified errors. Qualified errors are errors that reduce the utility for the customer and that cannot be said to be unimportant. This can be decided by the client and consultant unanimously. Another option is to outsource the testing to a non-biased third party.</p> <p><u>Add</u>: Only if the sprint is approved by the client (optional: on the advice of the non-biased, or third party/person), the next sprint can start.</p>
Article 2, clause 3, sub k	amend	See article 54 (in this table) for agile financial provisions.
Article 2, clause 3, sub l	notification	<u>Remember</u> : The stages of a project depend on the agile tool that is used. The allocation of costs can also be done per sprint (but not per requirement).
Article 2, clause 3, sub o	amend	<u>Add</u> : Consultation take place in agile ceremonies like: <i>sprint planning, daily stand ups, sprint reviews</i> and <i>retrospectives</i> . Transfer of information should happen continuously (face-to-face and in a visible way) during these ceremonies.
Article 2, clause 3, sub p	amend	<u>Add</u> : The documents that should be provided should be according the agile tool used. Formal documentation should be reduced to a minimum. Data should be provided in a clear visible way. Where possible prototyping or pilots studies should be used. Data should be shared actively, meaning client and consultant not only provide the information but actively involve each other.
Article 2, clause 3, sub t	notification and amend	<p><u>Remember</u>: When working agile, both parties should realize that the scope is evolving. This means not everything must be agreed upon up-front. As a result it is acceptable that subjects cannot be settled yet.</p> <p><u>Remember</u>: Agile works with the principle of '<i>response at the last responsible moment</i>'. This means decision are postponed till the last moment. (also sometimes referred to as: '<i>just in time</i>') This way the scope keeps as flexible as possible.</p> <p><i>The manner in which the scope keeps evolving can be found in chapter 4 (in this table).</i></p>
Article 3 Clause 2	amend	<u>Add</u> : The written concept should entail an agile approach. This means the commission should be described in a product backlog or a prioritized requirement list. Stipulate that this not only happens in consultation with the client, but TOGETHER with the client.

Article 4, clause 1	amend	<u>Add</u> : The written concept should entail an agile approach. This means the commission should be described in a product backlog or a prioritized requirement list. Stipulate this not only happens in consultation with the client, but TOGETHER with the client.
Chapter 3 – Special provisions with respect to the commission		
Article 5	add	<u>Add</u> : All others who execute activities under the consultant his guidance should work following the agile principles described in this contract. It must to be agreed upon in which manner others are involved in the agile ceremonies.
Article 6 Clause x	add	<u>Add</u> : If there are more than one consultant, all should work following the agile principles described in this contract. It must to be agreed upon in which manner others are involved in the agile ceremonies.
Article 8	amend	Optional: <u>Adjust/delete</u> this article in the case aesthetic is one of the acceptance criteria of the project or sprint.
Chapter 4 – Adjustments and alterations		
Article 9 Clause 1	delete	See new clause X1 (chapter 4).
Article 9 Clause 2	delete	See new clause X1 (chapter 4).
Article 9 Clause X1	New clause add	<p><u>Add</u>: After each sprint adjustments and alterations of the future commission and scope will be discussed by both parties.</p> <p><u>Add</u>: The client is entitled to change and re-prioritize future features after each sprint: before the start of the next sprint features can be exchanged (if technically possible), and priorities may be adjusted, as long as the total amount (time and cost) remains the same.</p> <p><u>Add</u>: Each update must be documented. This update will be an addendum to the contract.</p> <p><u>Add</u>: The scope freezes when a sprint is started. After a sprint start it must always be finished. All the sprints which took place in the past cannot be changed. This means only future sprints can be changed.</p> <p><i>For a visualization of the change management procedure see figure 3 in the previous section of this proposal.</i></p>
Article 9 Clause 3	amend	<u>Adjust</u> : Replace 'clause 1' to article 9, clause X1. The extra costs depends on the payment system, which is agreed upon in Chapter 2 of the DNR 2011 (Article 2, clause 3, sub k).
Chapter 5 – General obligations of the parties		
Article 11, Clause 1a	add	<u>Add</u> : The consultant should completely understand what agile entails. This is checked during a mutual kick-off or a survey. Both parties assure that all necessary knowledge and capacity for an agile approach is available.
Article 11 Clause 5	amend	<u>Add</u> : Information is shared continuously and is shared <i>face-to-face</i> during agile ceremonies like the <i>daily stand-ups</i> .

		Information should be visible and clear. Tools such as, burn down charts, scrum boards and prototyping is used to visualize ideas if this is possible.
Article 11 Clause 7	amend	<u>Amend:</u> Replace 'stage' with ' <i>sprint</i> ' (or <i>increment</i> or a similar agile term). <u>Add:</u> The consultant can only start a next sprint if: (1) The previous sprint must be completely finished and accepted by the client. (2) There is a 'definition of ready'. This means that there is a more detailed description of the result, acceptance criteria, and test criteria.
Article 11 Clause X2	New clause add	<u>Add:</u> The consultant works with <i>multidisciplinary teams</i> , these teams must contain all necessary skills and disciplines for the project <u>Add:</u> The teams will work <i>co-located</i> . It must be agreed if the consultant or client organises a suitable workplace to do this. This location must be known before signing the contract.
	New clause add	<u>Add:</u> The consultant must show control over the project, this is done by <i>monitoring</i> and <i>providing transparency</i> about the progress. This can be done by tools like <i>Burndown charts</i> and <i>Scrum boards</i> on a daily/weekly basis.
Article 12 Clause 5	amend	<u>Add:</u> This client representative must be empowered to take decisions on behalf of the client. <u>Add:</u> The client representative is part of the development team. <u>Add:</u> The client representative must take part in the agile ceremonies (e.g.: daily stand-ups.). Therefore, he or she must reserve enough resources (e.g. time).
Article 12 clause X3	New clause add	<u>Add:</u> Both parties assure that all necessary knowledge and capacity for an agile approach is available.
Article x clause X4	New article/new clause add	<u>Add:</u> Both parties must choose a specific agile tool for the project (e.g. <i>Scrum</i> , <i>AgilePM</i> , <i>Kanban</i> , etc., or a combination of such as long as it is clear which tool is followed).
Article x clause X5	New article/new clause add	<u>Add:</u> Both parties should provide full transparency in their communication. <ul style="list-style-type: none"> • Involve all stakeholder, also the end user(s). • Communication should go further than only providing information. Parties must <i>actively communicate</i>. The consultant should involve the client in the development of the solution. This way the consultant should let the client get a better understanding of the difficulties. • All information should be available and visible, this includes complications of the project. This should be done with <i>prototyping</i>. • <i>Face-to-face communication</i> is preferred above all other types of communication.
Chapter 6 – Liability of the consultant		
Article 13, Clause X6	New clause add	<u>Add:</u> No party is liable for statements or documents/data shown during sprint meetings. Parties are liable for the result of each sprint. The result is summarized at the end of each sprint. This is also the result which is tested conform the acceptance and test criteria (see article 2, clause 3, sub i).

Article 13, clause 1	amend	<u>Add</u> : This is only applicable, considering Article 13, Clause X6.
Chapter 7 – Delay, interruption and the consequences thereof		
Article 19, Clause 1	notification	<u>Remember</u> : The client should ideally already be aware of delays, due to his presence at the daily stand-ups. Still, delays will be documented as described in this clause.
Chapter 8 – Provisions applicable to cancellation of the commission		
Chapter 9 – Cancellation of the commission		
Chapter 10 – Consequences of the cancellation of the commission		
	notification	<u>Remember</u> : The entire project is finished when the <i>project vision</i> and enough <i>business value</i> is achieved. This is judged by the client in consultation with the consultant (final decision is made by the client). These conditions also depend on the chosen financial provisions (see chapter 12). An ideal of agile is that the client must be able to terminate the project after each iteration. Since this can cause problems for the consultant, this is governed as described in article 33 of the DNR 2011.
	notification	<u>Remember</u> : If the parties make use of a shared pain/gain model (see article 51, clause 1, option 2), then it must be decided by both parties that enough business value is achieved.
Chapter 11 – Ownership and use of rights on document of the consultant with respect to the advice		
	notification	<u>Remember</u> : The <i>ownership and use of rights on documents</i> differs per project. For small projects can follow the DNR 2011 chapter 10. However for bigger project the client and the consultant should decide upfront which article they want to incorporate or not.
Chapter 12 – Financial provisions		
Article 54 Clause 1	amend	<u>Amend</u> : The fee as desired by the parties is determined in writing prior to the coming about of the commission in one of the following ways or a combination of thereof: <ol style="list-style-type: none"> (1) Fixed price, fixed time, variable scope with fixed quality (optional per phase/sprint). (2) Target fixed price with a shared pain/gain model (optional per phase/sprint). (3) Reimbursable (see article 53). Payment per sprint is an option when a relationship between parties is not yet established. <i>The explanation of these options can be found in the agile contract proposal in the previous section.</i>
Article 52	notification	<u>Remember</u> : Is very hard to estimate upfront, so this very hard to estimate when using agile project management.
Article 54	notification	<u>Remember</u> : See option 1 and 2 of article 54 (in this table).
Article 55	notification	<u>Remember</u> : Depends on the agreed payment method of article 54 (in this table).
Chapter 13 – Applicable law, disputes and enactment		