Fit-for-purpose project management

An exploratory research into the practice of project management for infrastructure projects at three Dutch waterboards

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COLOPHON

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https://unsplash.com/photos/LBUcDC7ia18
Before you lies my graduation thesis, a partial fulfilment of the master Construction Management & Engineering at the Delft University of Technology, with the course code CME2000.

The topic of this research is something that has always had my interest during my master. On the one hand I learned a lot about projects, about legal and governance, about project finances, project management, process management, asset management, collaborative design, dynamic control and lots of other infrastructure project related aspects. On the other hand it remains theoretical knowledge from lectures and books, raising the question how this all works in the practice of project management? For this research I wanted to bring these two worlds closer together, to gain scientific knowledge and insights into how theories are transferred to practice, how project managers work with them and what that means for the success of a project. This curiosity formed the starting point that lead to a research about project management methodologies. Concerning PM methodologies, I always assumed and believed that a methodology is by definition standardized and therefore would need adjustments to be made fit for the purpose of a unique project. This research gave me the opportunity to investigate if this is true and how it works in practice.

This graduation project took 6 months to complete, and could not have been performed without the help of many people who supported me during this journey. First of all, I would like to express my gratitude to my graduation committee: Hans Bakker, Marian Bosch-Rekveldt, Louis Lousberg and Marco Buijnsters. The guidance throughout these months was more than I could have wished for, always close by for advice and to exchange ideas, knowing when and with what I needed help, good collaboration, open and helpful attitudes, honest and constructive feedback. Secondly, this research would definitely not have been possible without the 32 interviewees from the different public clients that made time for me and shared their knowledge, insights, guidelines and project documentation. Also I would like to thank all the supporting staff that facilitated these meetings and contributed to a smooth process. Thirdly, I would like to thank all my colleagues at Balance for the place that I had in their team, for the practical support, the nice lunches and walks in the park to clear my mind. Fourthly, many thanks to Evelien who helped me with the lay-out and preparation for the presentation. Finally, I would like to thank my close friends, love, family members, housemates and fellow CME graduate students. You have provided support when I needed it, tips and tricks for the thesis-life, joyful distractions and much needed advice.

_Catharina de Jong_
_Delft, July 2018_
EXECUTIVE SUMMARY

The construction of infrastructure in the Netherlands is initiated by the Dutch government, and performed in the form of projects. On average €8 billion per year is spent on these infrastructure projects, thereby contributing to the construction industry as a national economic driver. About 50% of projects in this sector are initiated by public clients. Project management methodologies (in short PM methodologies) are the working methods of these public organisations that initiate projects. PM methodologies are theories on how projects should be performed, with guidelines and books written about all aspects a project could entail. PM methodologies are standards that were created in order to achieve better project results and to be able to better predict project success. The use of PM methodologies within an organisation is often based on the assumption that all projects are homogeneous, which is often not the case. If the latter is true, a standard methodology does not fit a unique project, and adjustments to the methodology would need to be made for it to be fit-for-purpose. This precisely is where this research comes in: there has not been a single study into what these adjustments are at the level of a project, why adjustments are done and what is contributed to project success.

This research aims to investigate what happens with PM methodologies in the practice of public clients in the Netherlands, to eventually contribute insights and knowledge that could perhaps make project management in the future more effective. This is realised by finding an answer to the main research question:

How do the fit-for-purpose adjustments to the PM methodologies used by public clients in the Netherlands contribute to project success of infrastructure projects?

The answer to this research question was found using a qualitative research approach where first orientation in practice was combined with a literature study. The empirical data collection is a multiple case study into 6 projects at 3 different waterboards. Cross case analysis shed light on adjustments in practice, their underlying reasons and project success, which was all evaluated by an expert panel before formulating the conclusions and recommendations. The scope of this research contains infrastructure projects initiated by public clients in the Netherlands, to be more specific the PM methodologies that these public clients use and how they use them, instead of focussing on the theories themselves it targets the adjustments made to the methodologies, their underlying reasons and relation to the success of a project.

The practical orientation interviews were conducted with 13 project management professionals working at the national government, regional governments, waterboards, local government and one semi-public organisation. The PM methodologies that are used by these organisations include: PMW, PMC, PRINCE2 and the collaboration model IPM, which was used as an input for the literature study. This research was continued at the governmental layer of waterboards, where 3 different waterboards were selected (with 3 different PM methodologies). At each waterboard a HWBP project (High Water Protection Programme) and a regular project were studied, resulting in 6 projects. An overview of the selected projects for the case studies is provided in Table 1.

<table>
<thead>
<tr>
<th>WB</th>
<th>Project</th>
<th>Type</th>
<th>Subject</th>
<th>PMC</th>
<th>PRINCE2</th>
<th>Own meth.</th>
<th>IPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WB1A</td>
<td>HWBP</td>
<td>Dike reinforcement</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>WB1B</td>
<td>Regular</td>
<td>Renovation: water pumping station</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>WB2A</td>
<td>HWBP</td>
<td>Dike reinforcement</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>WB2B</td>
<td>Regular</td>
<td>Renovation: sluice</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>WB3A</td>
<td>HWBP</td>
<td>Coastline reinforcement</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>WB3B</td>
<td>Regular</td>
<td>Dredging of a waterway</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Overview of the projects for the case studies.
Another 13 interviews were conducted for these case studies, with the project managers and their internal clients. Based on the case study results, a distinction was made between organisation-specific adjustments and project-specific adjustments (relationship X and Y in Figure 1).

![Figure 1: Relationship X and Y.](image)

Some organisation-specific adjustments occurred from these case studies and 16 project-specific adjustments were found ranging from additional financial mandate, to shared risk registers and skipping phases or phase documentation. Slight differences were found between the occurrence for different methodologies but no conclusions can be derived from this.

Regarding the project success, none of the waterboards had any organisational definitions of project success, nor did the project managers formulate project-specific success criteria. Nevertheless, the adjustments to the PM methodologies that were performed were mostly said to positively contribute to the success of the project. ‘Time’ was the most prominent underlying reason for the project managers to make adjustments, and when discussing important aspects of project success, mostly time and budget were named to be of importance.

The analysis phase was evaluated by an expert panel consisting of 7 experts from different organisations throughout the Netherlands, who recognised the nature of the adjustments, the most prominent underlying reason of time and traditional perception of project success (time and budget). After this evaluation another distinction was made between adjustments being deviations from the organisation-specific methodology or adjustment being additions to this methodology. Whether or not the found adjustments should be included in the organisational-specific methodologies was discussed, roughly half of these adjustments can be included to create added value or opportunities for future projects.

Based on this research, the main research question was answered:

Fit-for-purpose adjustments were found to be applied in two forms, organisation-specific and project-specific adjustments. These project-specific adjustments occurred in many forms, ranging from e.g. additional financial mandate, to shared risk registers and skipping phases or phase documentation. These adjustments can be categorized in two ways, as deviations or additions. The overall majority of these adjustments was said to contribute to project success in a positive way, having a (large) contribution to the success of the project. Project success is in general perceived by the interviewed project managers as mainly a focus on time and budget, and from the underlying reasons for these adjustments time was the most prominent aspect, therefore time related adjustments contribute most to project success.

Recommendations for future research include more research into the contribution of the adjustments to project success, the quantitative occurrence of adjustments to PM methodologies (this now seemed to be limited), the development of an impact framework for adjustments and more research into implicit or secondary underlying reasons for adjustments. Recommendations for practice include a list of adjustments that could be included in the organisation-specific methodologies, and the formulation of organisation wide success criteria and project specific success criteria. Insight was created for project management consultants and the context of these findings in the light of project success highlighted.

Keywords: Fit-for-purpose, project management, PM methodologies, adjustments, project success, infrastructure, Dutch public clients.
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LIST OF ABBREVIATIONS

CBT  Centraal Beheers Team, responsible for the management of the in-house methodology at WB2
IC   Internal Client
IPM  Integraal Project Management, see Section 4.1.4
GOTIK Geld, Organisatie, Tijd, Informatie, Kwaliteit (money, organisation, tijd, information, quality)
OECD Organisation for Economic Co-operation and Development
PID  Project Initiatie Document (project initiation document)
PM   Project Manager
PM methodology Project Management Methodology
PMC  The PM methodology ‘Projectmatig creëren’, see Section 4.1.3
PMW  The PM methodology ‘Projectmatig werken’, see Section 4.1.2
PSU  Project Start Up
RWS  Rijkswaterstaat
WB   Waterboard
1 INTRODUCTION

This first chapter provides an insight into what this research is about and why it was conducted. This will be done by providing the context of this research (Section 1.1), the problem statement (Section 1.2), the objective of this research (Section 1.3) and the main research question along with four sub questions (Section 1.4). Finally the structure of the entire report will be elaborated on in Section 1.5.

1.1 Context

Infrastructure in the Netherlands is initiated and funded by the Dutch government as a way to invest in this country’s accessibility and future. Dikes protect us from the water, highways connect cities and railways make it possible to travel to family and to work. All these different types of infrastructure don’t come into existence overnight, they need to be initiated, planned, designed, constructed and paid for. Realisation of infrastructure happens mostly in the form of projects: unique, with a specific scope, a start and finish (more on the definition of a project in sub section 1.4.1). The Dutch central government spends on average €8 billion per year on Infrastructure and Environment over the past years (TweedeKamer, 2016), all in the form of projects. In the European Union, 5.3% of GDP is spent on construction projects (Eurostat, 2017). These statistics show how big the infrastructure sector is, and as Boyd and Chinyio (2006, p. 2) rightly mention: the construction industry “is a national economic driver” in which public clients have high interests. Studies have shown that within this sector about 50% of these projects are initiated by public clients (Eisma & Volker, 2014). Therefore the public clients (which include state level clients, but also provinces, waterboards and municipalities) have a huge impact on the construction industry, and their working methods deserve a closer look.

Every infrastructure project that is initiated applies a specific working method, the project management methodology (PM methodology) that is used throughout the project. This method can be chosen per project, but often in practice there is an organisation-wide PM methodology that is applied to all projects, under the assumption that all projects within that organisation are homogeneous (Müller & Turner, 2007). This evokes curiosity: Could it be true that all projects within one (public governmental) organisation can be performed in the same way using the same PM methodology? Or if not, what does that mean for the project success and indirectly for the investment of taxpayers money? Is it necessary to make project specific adjustments to the PM method to make it more fit-for-purpose? This study looks into these kind of questions, to find out what happens exactly with PM methods in practice and how this influences the eventual project success of infrastructure projects at public clients in the Netherlands.

1.2 Problem Statement

The above provided context demonstrates how big the construction sector in the Netherlands is, and how much money is involved with it. Since 50% of these projects is procured by public clients (Eisma & Volker, 2014), a lot of public money is involved. A public client should therefore spend it as wisely and efficiently as possible. This does not only mean choosing the cheapest or economically most advantageous bidder in a tender procedure, but also that the entire project should be managed accordingly. This justifies the research into the PM methods of these public clients.

The current lack of knowledge into the fit-for-purpose methods of the public client (more on this in Chapter 4) indicates that more research is needed, to map and assess which methods prove to be successful. This would not only increase the scientific knowledge, but would help to gain insight into best practices in the field of public client project management. Eisma and Volker (2014) confirm this statement by concluding in their systematic literature review that research into the organisational level
of public clients is insufficiently highlighted. Together, this provides a good reason for conducting this graduation research.

### 1.3 Research objective

The objective of this research is to investigate what happens in practice with the PM methodologies of public clients that commission infrastructure projects in the Netherlands, and to contribute knowledge about adjustments to PM methodologies in order to eventually make project management of Dutch infrastructure projects more effective. Do they use any PM methodology at all? If so, what methodologies? Are all projects from that public client performed in the same way? Do the project managers make adjustments to the methods used, and if so, why does that happen and what is the influence of these adjustments on the eventual success of the project? This research aims to investigate these questions and fill the gap in scientific knowledge about the practice of PM methods. Section 1.4 will provide the main research question, along with four sub questions that will address these issues. With the conclusions and recommendations of this research, project managers working on projects at these public clients in the Netherlands gain insight into the reasons for adaptations to PM methods and those clients can better understand the needs of project managers in the day-to-day business. Furthermore, this research will either confirm what has been found so far in existing literature, or contradict an entire school of thought on the need to make fit-for-purpose adaptations, which will either way provide new insights and directions for future research.

The relevance of this research can be divided into two aspects, theoretical and practical relevance:

1. **Theoretical relevance**: Referring to the scientific contribution, where a specific set of conclusions and recommendations will enlarge the knowledge about PM methods in practice and where new and interesting areas of research are indicated for future studies.
2. **Practical relevance**: Referring to the use of this research in practice. The practical relevance is the structured insight in the adaptations to PM methods, why they happen and what is gained from it. This should provide project managers as well as the public client employing those project managers with insights to make the projects and perhaps even their internal processes more effective and efficient.

This research is commissioned by ‘Balance – Advies, Projecten, Interim’. The contribution to their business is the insight in the practice of PM methodologies, what actually happens in the daily use of PM methodologies, why that happens and what the influence is on project success. Understanding this will facilitate in advising their clients more precisely. In case of providing interim employees to their clients these employees could guide and steer the use of PM methodologies in light of the findings of this research to hopefully achieve better project results.

### 1.4 Research question

From the context, problem statement, and research objective the research question can be formulated. A research question should be formulated in such a way that the answer provides the information with which the research objective can be accomplished (Verschuren & Doorewaard, 2010, p. 20). Verschuren and Doorewaard (2010, p. 93) also argue that the main role of the research question is its steering function and that it also needs to be efficient in indicating what kind of knowledge is needed to answer the question. Eisenhardt (1989) stresses the same about the research question, stating “without a research focus, it is easy to become overwhelmed by the volume of data”.

Combining these guidelines, the research question for this graduation research will be:

**How do the fit-for-purpose adjustments to the PM methodologies used by public clients in the Netherlands contribute to project success of infrastructure projects?**
To answer this main research question multiple aspects need to be investigated and only when those aspects come together the research question can be answered. Therefore the following sub questions are defined, which will be answered throughout the different chapters.

1. What kind of PM methodologies does the public client use?
2. What is already known about the use of PM methodologies, their adjustments in practice and project success?
3. What adjustments are made to the PM methodologies to make it more fit for the purpose of a specific project?
4. In what way and to what degree do the fit-for-purpose adjustments contribute to project success?

1.4.1 Definitions

When defining the world around us, we use words to describe what we mean, what we see or what we intend. However, different people can use different words for the same thing. This can be confusing and sometimes even lead to costly errors as result of miscommunication, e.g. the loss of the NASA's Mars Climate Orbiter in 1999 where the measuring units were not clearly defined and the crash was the result of “failure to use metric units in the coding of a ground software file” (Sauser et al., 2009, p. 666). Therefore before this report continues some definitions are stated, to prevent any possible miscommunication or double interpretations of crucial elements in this research.

A project

In previous decades projects have been defined in many different ways, slightly adjusted depending on the author. Turner has devoted multiple publications to projects and project management, coming to the following definition in 2003: “A project is a temporary organization to which resources are assigned to undertake a unique, novel and transient endeavour managing the inherent uncertainty and need for integration in order to deliver beneficial objectives of change” (Turner & Müller, 2003, p. 7).

Project management

Project management is defined by Turner and Müller (2003, p. 2) as “the process by which projects are successfully delivered, and their objectives successfully achieved”. This was specified a bit more by the Project Management Institute in their book ‘A guide to the project management body of knowledge: PMBOK’, where they state that “project management is the application of knowledge, skills, tools and techniques to project activities to meet project requirements” (PMI, 2004, p. 8). In this definition also the project requirements are mentioned as main goal, but overall it is more specific than only the ‘success criterium’ of Turner and Müller. Therefore this second definition will be used throughout this report when referring to project management.

Public client

The public client that this research will be referring to is the governmental body that initiates an infrastructure project, in literature often described as construction client. The definition of a construction client according to the OECD is: “the natural or legal person for whom a structure is constructed, or alternatively the person or organisation that took the initiative for the construction” (OECD, 2017). However, this definition is not completely sufficient for the public construction client, as this is general for every type of client. Hermans, Volker, and Eisma (2014) argue that for public organisations the expectations are higher than for private construction clients. Boyd and Chinyio (2006) state that the main difference between a public and a private client relies on the profit orientation of the private client, while public clients are non-profit oriented. This is due to the fact that public clients spend tax payers’ money with which they aim to improve the country and its infrastructure. The ‘higher..."
expectations’ that Hermans et al. (2014) mention concern the European and Dutch laws on procurement with which public clients need to comply while private clients don’t. Eisma and Volker (2014) add that public clients need to operate transparently, objectively and accountable.

Engwall (2002) argues that a project is not an island, by which he means that projects are embedded in history but also in organisational context. He concludes that a perspective on project management that takes into account this organisational influence would be beneficial to the practice of project work. This organisational context is influenced by the public client that commissions the project. Public clients that influence the organisational context can be found on different levels within the Dutch government. For example the biggest public construction client in the Netherlands is at state level, but also provinces, waterboards and municipalities are public clients. These public clients therefore differ in size, working areas and experience with PM methods (more on these different public clients in Chapter 0).

Adjustments
When describing adjustments in this report, the author refers to deviations from the PM methodology that is used by the public client. These can be adjustments from the ‘official theory’ towards an organisation, or adjustments from the handbook of the organisation towards a specific project. Adjustments, adaptations, deviations, alterations and modifications mean the same thing in this context.

1.5 Structure of the report

After writing a research proposal to get a flying start, the project was performed in four different phases resulting in the four parts of this report. This is shown in the research framework of Figure 2 on page 7. After this introduction chapter, part one will continue with the research design (Chapter 2).

The second part consists of an exploration of PM methods, which was done in two ways: in practice (practical orientation, Chapter 3) and a literature study as theoretical exploration (Chapter 4). Sub questions 1 and 2 will be answered in this part.

Part three is the empirical data collection, where case studies were performed and interviews were conducted (Chapter 5). With the results of chapter 5 the third sub question will be answered. The analysis of the obtained data is described and evaluated in Chapter 6, and sub question 4 is answered. The fourth and final part of this report includes the discussion (Chapter 7) and the conclusions and recommendations (Chapter 8).
2 RESEARCH DESIGN

This chapter describes the research design that is used throughout this entire research. This research is the final project before graduation, and should therefore be approached as a project, with a ‘project plan’ that includes the what, why, how, where and when. This structured way of working helps and guides the research, and provides an efficient way of obtaining answers to the research questions (Verschuren & Doorewaard, 2010).

This chapter will provide the research characteristics (Section 2.1) where the type of research and used methodology will be discussed. The research scope (Section 2.2) elaborates on what is included in this research and what is not. The research framework (Section 2.3) provides a clear view on the different phases of this research and how they are related. This chapter will be concluded by the validity of this research being discussed in Section 2.4.

2.1 Research characteristics

Within research there are two main types: qualitative and quantitative research or a combination of those, the mixed method (Creswell, 2003, p. 3). Each of them has a different way of approaching the subject, and the formulation of the research question can be in such a way that one of the types better suits the desired goal.

This research is characterised as qualitative research. The main research question “How do the fit-for-purpose adjustments to the PM methodologies used by public clients in the Netherlands contribute to project success of infrastructure projects?” is more suited to be approached in a qualitative way, as will be demonstrated by this definition of Creswell (2013):

“Qualitative research begins with assumptions and the use of interpretive/theoretical frameworks that inform the study of research problems addressing the meaning individuals or groups describe to a social or human problem. To study this problem, qualitative researchers use an emerging qualitative approach in inquiry, the collection of data in a natural setting sensitive to the people and places under study, and data analysis that is both inductive and deductive and established patterns or themes. The final written report or presentation includes the voices of participants, the reflexivity of the researcher, a complex description and interpretation of the problem, and its contribution to the literature or a call for change” (Creswell, 2013, p. 44).

The underlined words, the steps of a qualitative research in this definition, match the structure of this research.

First the assumption is made that most likely adjustments to PM methods are needed due to the complexity of the world around us, and the infrastructure projects in it. Second, a literature review was conducted to create a theoretical framework. Using that framework (and the exploration of PM methods in practice), the cases are selected and interview questions are composed. The data was gathered in the form of project documents, guidelines and the audio recordings of the interviews that mostly took place in the working environments of the interviewees. This was all used in the analysis, where the search for patterns and themes reached the final stage. The voices of the participants can be heard throughout the main text, and the transcripts are digitally available upon request. A reflection on this research is part of the final report and presentation, as well as a clearly defined contribution to existing literature, a personal reflection is added in Section 8.3.

Since the grounded theory of Glaser and Strauss (1967) was developed, the field of qualitative research became more recognised. Dozens of researchers have made own variations and additions resulting in an array of publications on qualitative research, posing different approaches and processes. One of the
most cited authors in this field advises that when the main question of a research starts with a “how” or a “why” (as with this research) often the preferred strategy is to opt for case studies (Yin, 2003, p. 1). This research is interested not only in the adjustments to the PM methods used, or when and where they occur. The focus is much more on the ‘why’ this happens and ‘how’ this influences project success. The reasons behind the adjustment is what matters more than just the adjustment itself. This can only be achieved by asking open-ended questions; a fixed set of survey questions with multiple choice answers (mostly used in quantitative research) would not be sufficient.

2.2 Research Scope

Every research needs to have a precisely described scope; this will determine which findings that are encountered during the research need to be considered to answer the research question and which findings are interesting but should be left out. As Verschuren and Doorewaard (2010, p. 144) put it, you have to add details that narrow the ‘population’ to a domain that is “manageable within the scope of the research project”. Translating their word ‘population’ to this research, it means that of all possible projects in the world we narrow it down to a few cases which we can actually investigate that contribute to answering the research question within the given time scope of six months.

For this research at first infrastructure projects are considered, because of the public value of infrastructure, their presence everywhere around us, and their necessity for the functioning of a country. This brings us to the public clients who initiate these infrastructure projects. How public clients work and how the governmental layers are organised differs per country, therefore it is chosen to only look at infrastructure projects within the Dutch borders, to limit the scope and possible noise in the result of this research. As argued in Section 1.1, the working methods of these public clients deserve a closer look, the way they organise their work, the projects they deliver, and how their ways of acting in practice influence the success of the projects.

During the exploration of PM methodologies used by public clients in the Netherlands (Chapter 0) the scope will be narrowed down to which public client will be the focus of the rest of this research, and Section 5.2 will elaborate on the case selection, narrowing down the scope even more to the level of single projects.

2.3 Research Framework

The structure of this report is summarized in the research framework of Figure 2, with elaborations per phase of the research in sub sections 2.3.1 to 2.3.4.

![Figure 2: Research framework.](image-url)
2.3.1 Phase 1 – Exploratory research

This phase consists of two parts, the literature study (which is a desk research) and a practical orientation (which is an empirical field research). To define the focus of the research first the practical orientation was performed, followed by a literature study. This was done to develop a feeling for the situation - in theory as well as in practice - and gain insights on which the later interview questions for the cases were based. Sub questions 1 and 2 were answered in this phase.

2.3.2 Phase 2 – Empirical data collection

The empirical data collection phase is where the case studies were performed. The guidelines (of the PM methodologies) of the organisations as well as the project documents were researched, and the interviews were conducted. The interviewees were the project managers of the projects that are selected for the cases. Next to this also the ‘internal clients’ were interviewed about the same project but from a different perspective. The results from these interviews were processed. To keep the research clean and without any internal entanglement or steering from interviewees, the persons interviewed in Phase 2 were not allowed to be the project managers interviewed in Phase 3. In this phase sub question 3 was answered.

2.3.3 Phase 3 – Data analysis

The data that was collected in the previous phases was analysed, resulting in findings from the cross case analysis. To check if these findings are valid, an evaluation round was organised with an expert panel. These people (7 PM professionals) were presented with the findings, and their opinion was taken into account to be able to refine the final recommendations in the next phase. The experts in the panel are not allowed to be the interviewed project managers or public clients from phase 2, but are allowed to be the same persons as were interviewed in phase 1 for the exploration. In this phase sub question 4 was answered.

2.3.4 Phase 4 – Conclusions and recommendations

The fourth and final phase of this report includes the discussion. In this phase all the results and analyses were reflected on and the final conclusions were formulated. In this phase the main research question of this report was answered, followed by recommendations for practice and future research.

2.4 Validity of the research

When discussing validity, a distinction can be made between external and internal validity. 

External validity is concerned with the generalizability of the findings, are they valid for other cases as well? This external validity as part of qualitative research has received the most critique, which can be countered by the reply that the external validity of case studies relies on “analytical generalization” (Yin, 2003, p. 37). Therefore Yin states that multiple-case studies are always preferred over single-case studies.

Internal validity focusses on whether causal relations in explanatory studies are valid, or if there might be another factor that influences the outcomes (Yin, 2003). An aspect that could improve the quality of qualitative data analysis is ‘triangulation’, defined as “the application of multiple data collection methods in one study” (Van Staa & Evers, 2010, p. 5). By making use of the concept of triangulation the chance that certain information might be overlooked thereby missing a link in the causality is limited.

This research consist of a multiple-case study investigating 6 cases which are described in Chapter 5. For each case the project manager and the internal client were interviewed, to get the inside
information from two different perspectives. In addition, for each case the PM methodologies (guidelines) were analysed, along with relevant project documentation. Important for the quality of case studies is that the cases should not be selected by the use of random sampling (common when performing quantitative research), but that they should be chosen strategically. An elaboration on the selection of these cases can be found in Section 5.2. Evaluation of the preliminary conclusions was done in the form of an expert panel. This is a group of professionals active in the field of project management, who have not been involved in the case studies. With their expertise they have judged the cross case analysis findings, whether the outcomes are generalizable and if they recognise it from their years of experience in project management.

Reliability is also a significant aspect of scientific research. The researcher should always act as if somebody was watching over their shoulders, documenting every step of the way. A researcher should be prepared to be fully audited, she\textsuperscript{2} should be able to account for all the steps taken in the research, which would lead another researcher to the same conclusions. “The goal of reliability is to minimize the errors and bias in a study” (Yin, 2003, p. 37).

When performing this research, the author has documented every step of the journey. For the literature review a database was set up, and marks and notes were printed and labelled corresponding to that database. All interviews were taped and the audio recordings were transcribed, stored and added to a separate appendix of this research which is digitally available upon request. All other documents, related to the cases or personal notes were saved and stored digitally and hardcopy as well. Nothing was deleted during the process, working versions of this report were saved separately per calendar day and everything that contributed to this research will be saved until the date of graduation.

\textsuperscript{2} The personal pronoun ‘she’ is chosen for the project manager in general throughout this entire report. For the readability one gender was chosen to avoid the use of ‘he/she’ and ‘he or she’; this could also have been male.
PART TWO

Exploring the practice of PM
Literature study
3  EXPLORING THE PRACTICE OF PM

The practical orientation in this chapter is based on 13 interviews with professionals working or advising in the field of infrastructure project management and construction management. This practical orientation was needed in order to gain insight in what kind of PM methods are used by public clients in the Netherlands, thereby answering sub question 1:

“What kind of PM methodologies does the public client use?”

The public clients in the Netherlands were divided into four groups: the national government, regional government, waterboards and local governments, with the addition of one semi-public organisation. In addition the main author of the book “Wegwijzer voor methoden bij projectmanagement” Ariane Moussault (Moussault et al., 2011) was interviewed, as well as one person who has been working at Rijkswaterstaat for 40 years and knows everything about “Integraal Project Management” (abbreviation: IPM; more on this in Section 4.1.4).

Each of the initial 11 interviewees answered a short set of questions about their background, after which the interview took place based on the same 12 questions for each interviewee (this can be found in Fout! Verwijzingsbron niet gevonden, on page 77). The interviewees were selected based on the public clients where Balance is active (on interim basis or as consultant). This was done from a pragmatic point of view, because making contact, arranging interviews and analysing the interviews all with non-Balance employees would be unfeasible in the available time for phase 2. From the list of Balance employees that are active at these public clients a second selection was made based on where they work or what their previous work experiences with the public clients were. It was made sure that each category had at least two interviewees with significant work experience. The background information on these interviewees can be found in Table 2. The results of these interviews are grouped into the next five sections (Section 3.1 to 3.5), followed by the discussion of the findings in Section 3.6 and the conclusion in Section 3.7.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Current or recent organisation</th>
<th>Employer</th>
<th>Years</th>
<th>Current function</th>
<th>Organisation category</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID-1</td>
<td>Port of Rotterdam</td>
<td>Balance</td>
<td>18</td>
<td>Project manager</td>
<td>Semi-public</td>
</tr>
<tr>
<td>ID-2</td>
<td>Rijkswaterstaat</td>
<td>Balance</td>
<td>2</td>
<td>Assistent sleutelfunctionaris en planning</td>
<td>National government</td>
</tr>
<tr>
<td>ID-3</td>
<td>Rijkswaterstaat, Waterboard Rivierenland</td>
<td>Balance</td>
<td>15</td>
<td>Business consultant</td>
<td>National government</td>
</tr>
<tr>
<td>ID-4</td>
<td>Rijkswaterstaat</td>
<td>Balance</td>
<td>30</td>
<td>Senior business consultant</td>
<td>National government</td>
</tr>
<tr>
<td>ID-5</td>
<td>Waterboard Rijnland</td>
<td>Balance</td>
<td>21</td>
<td>Project manager</td>
<td>Waterboard</td>
</tr>
<tr>
<td>ID-6</td>
<td>Waterboard Rijnland</td>
<td>Balance</td>
<td>20</td>
<td>Technical manager &amp; contract manager</td>
<td>Waterboard</td>
</tr>
<tr>
<td>ID-7</td>
<td>Province Overijssel</td>
<td>Balance</td>
<td>11</td>
<td>Technical manager</td>
<td>Province</td>
</tr>
<tr>
<td>ID-8</td>
<td>Province Utrecht &amp; province Overijssel</td>
<td>Balance</td>
<td>10</td>
<td>Tender manager</td>
<td>Province</td>
</tr>
<tr>
<td>ID-9</td>
<td>Rijkswaterstaat</td>
<td>Balance</td>
<td>30</td>
<td>Business consultant</td>
<td>National government</td>
</tr>
<tr>
<td>ID-10</td>
<td>Municipality of Amsterdam</td>
<td>Municipality of Amsterdam</td>
<td>13</td>
<td>Project manager</td>
<td>Local government</td>
</tr>
</tbody>
</table>

3 Years or relevant work experience in the field of project management.
<table>
<thead>
<tr>
<th>ID</th>
<th>Municipality of Leusden, municipality of Apeldoorn, Waterboard Schieland en de Krimpenerwaard</th>
<th>Balance</th>
<th>34</th>
<th>Senior consultant area development</th>
<th>Local government, waterboard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moussault, A. (2018)</td>
<td>Author of the book “Wegwijzer voor methoden bij projectmanagement”</td>
<td>Independent</td>
<td>25</td>
<td>PM professional: coach, trainer, author, manager...</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 2: Background of the interviewees of the practical orientation.

3.1 National government

The national government in the Netherlands has 12 ministries, including the Ministry of Infrastructure and Water Management, which is committed to “improving quality of life, access and mobility in a clean, safe and sustainable environment” (Ministry of Infrastructure and Water Management, 2018). The executive organisation of this Ministry is Rijkswaterstaat, founded in 1798 to improve the liveability, safety and accessibility of roads and waterways in the Netherlands (Rijkswaterstaat, 2018a). At Rijkswaterstaat about 8,800 people are employed who work daily to achieve this mission. They make sure we can use all main roads and keep our feet dry as about 9 million people in the Netherlands live in flood prone areas (Rijkswaterstaat, 2018b). Their annual budget for 2016 was €4.2 billion, with which they aim to deliver projects and maintain road and water systems throughout the country.

Four persons that work or have recently worked at Rijkswaterstaat were interviewed (ID-2; ID-3; ID-4; ID-9), with the addition of the senior advisor on project management at Rijkswaterstaat (Wermer, 2018) who has worked there for 40 years and is the ‘guardian’ of the IPM model. The transcripts of those interviews are digitally available upon request.

Findings

Rijkswaterstaat works with the IPM model since 2005. This is seen as a collaboration model and not as an official PM methodology. The PM method that supports this form of collaboration is ‘Projectmatig Werken’ (PMW). How Rijkswaterstaat works with this IPM and PMW is written down in the ‘Werkwijzer Aanleg’, which is an internal document available via the intranet of Rijkswaterstaat. This ‘Werkwijzer’ is updated regularly based on the input of expert meetings. When IPM was introduced in 2005 there was resistance, but that has faded over the last decade resulting in a widely accepted way of working. Internal quality checks and gate reviews test whether the employees work with the IPM and with PMW. In principle IPM is used for all projects, although Freek Wermer (Wermer, 2018) does state that in some cases (in smaller regional projects e.g.) the project setup slightly differs from the described model.

3.2 Regional government

The Netherlands is geographically divided into 12 provinces: the regional government layer between the national government and the local government, taking on all the work that falls in between these two entities. To investigate this governmental layer, two interviews were conducted with interviewees (ID-7; ID-8) having recent work experience at the provinces of Overijssel and Utrecht.

Findings

The province of Overijssel works with the IPM model, while the province of Utrecht has only applied it in incidental cases. Both provinces work with a handbook which is based on PMW and available to all employees via the intranet. Updates are not regular, mostly only when national law is updated, which
has its implementation on some features of the work of the provinces. Both interviewees stated that random audits are performed at the provinces, but have not been audited in their time there. Overijssel uses the IPM model in principle, but uses a so called “IPM-light” for the smaller projects where no full IPM team is needed.

3.3 Waterboards

Waterboards are a special type of government that so far only exist in this form in the Netherlands (ID-4, 2018). In total there are 21 waterboards, which cross the boundaries of provinces and municipalities dividing the country in sections depending on the water in the area (e.g. rivers, lakes, deltas, seaside). The first waterboard was founded already in 1255 AD (Waterschappen.nl, 2018) and the continuous fight against water in the Netherlands is what has shaped our collaborative approach to many problems over the centuries. These waterboards are legally allowed to impose their own taxes on Dutch citizens living in their territory, which makes them a powerful governmental body with their own agendas. Often these waterboards have their own projects (e.g. dike enforcements along rivers within their own territory), but there are also projects initiated by Rijkswaterstaat that cross the boundaries of multiple waterboards. These have the purpose to improve the efficiency and effectiveness of solutions considering water problems on a national scale, e.g. the ‘Room for the River’ project and the ‘Hoogwaterbeschermingsprogramma’ (HWBP, the high water protection program).

To gain insight into the working methods of waterboards, three persons were interviewed about their recent work at the waterboards of Rijnland (two persons), Schieland en de Krimpenerwaard (ID-5; ID-6; ID-11), with some extra comments of interviewee ID-3 about the waterboard Rivierenland.

Findings

The waterboard Rijnland uses the IPM model since 2.5 years. Previously they worked with the “traditional project management method” where one project leader organised everything on his own with whatever methods or tools she preferred. Small projects are clustered in order to be able to fit it into the IPM model. Some small projects with project managers that refuse to work with IPM are still done in the traditional way. Under the IPM collaboration model the PM methodology is ‘Projectmatig Creëren’ (PMC), which are both described in a handbook that is available on the intranet. Employees and their commitment to these working methods are checked in evaluation conversation, peer reviews and the quality manager uses their input to further improve the handbook.

The waterboard Schieland en de Krimpenerwaard also uses the PMC methodology, from which they have the official handbook, unadjusted to their own organisation. This document is not often updated, maybe if a newer edition would be published it would be replaced or if employees join a seminar those insights might be shared. The project plan needs to be in a certain format, and therefore the presence and layout of the phase documents functions as a review. The project plan formats are available for both large and small projects. The waterboard of Rivierenland also uses the IPM model, but when working on small projects often the traditional method of one project leader is used. Waterboards often look at the ‘Werkwijzer Aanleg’ of Rijkswaterstaat and try to copy it, sometimes skipping entire roles like the ‘omgevingsmanager’ (OM, stakeholder manager) (ID-3, 2018).

3.4 Local governments

Local governments are the smallest governmental bodies, in total there are 380 municipalities in the Netherlands (CBS, 2018). The differences in size are enormous, the capital Amsterdam has about 850.000 inhabitants (CBS, 2017a), while the smaller municipalities in rural areas might only have a few hundred inhabitants. Municipalities in the Netherlands are responsible for every aspect of the city or

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4 Some waterboards are called ‘Hoogheemraadschap’ which is an old Dutch name for a bigger waterboard responsible for a bigger area (Encyclo.nl, 2018) and historically responsible for some smaller waterboards before the many mergers. This does not mean there is any difference in organisation, tasks or government.
village, this also includes being responsible for all the infrastructure within the municipality. In the case that infrastructure exceeds the municipal borders, the province, waterboards and/or Rijkswaterstaat may be involved depending on the size of the infrastructure project.

To gain insight into the working methods of different municipal organisations, two persons were interviewed, one project manager at the municipality of Amsterdam\(^5\) (ID-10, 2018) and one person currently working at the municipality of Leusden with previous experience at the municipality of Apeldoorn (ID-11, 2018).

Findings
The municipality of Amsterdam works with the IPM model since 3 years, and explicitly calls it the “IPM-idea” because of the slight adjustments in their interpretation as compared to the IPM model of Rijkswaterstaat. This is however not adjusted to their own organisation, as this form of collaboration and the underlying PM methodology PMW are not described in any internal documents. Therefore it is also not checked or evaluated how the employees work with these methods. Smaller projects are clustered to be able to be performed by one IPM team.

With regard to the municipality of Leusden (which has around 30,000 inhabitants (CBS, 2017c)) we can be quite short: there is no form of PM methodology whatsoever. Apeldoorn (number of inhabitants roughly 160,000 (CBS, 2017b)) falls in between these two extremes so to say. This municipality had once developed a methodology that they wanted to use for all their projects. This was finished and disappeared into the archives. In 2012 somebody decided to reintroduce this method. At the start of this reintroduction employees used it sometimes, but there was no control or evaluation on this, and because employees did not like it they stopped using it. Therefore on paper there is a PM methodology at the municipality of Apeldoorn, but in practice there is not.

3.5 Semi-public organisation

Next to the four types of public governments discussed above also one interview was conducted with a project manager at the Port of Rotterdam (ID-1, 2018) to gain insight in the working methods of a semi-public organisation. This company is an ‘NV’ which is not publicly traded, but is publicly owned for about 70% by the municipality of Rotterdam and the other 30% by the national state (Havenbedrijf-Rotterdam, 2018). The area that falls under the responsibility of the Port of Rotterdam is roughly 40km long and stretches from the city centre of Rotterdam all the way to the sea, including the water of the Maas itself and the riverbanks on both sides. Everything that happens within this territory is the responsibility of the Port of Rotterdam, which includes constructing a simple driveway but also constructing the second Maasvlakte for example.

Findings
The Port of Rotterdam decided about 6-7 years ago that they wanted to work with the PRINCE2 methodology, which was a top-down enforced decision. Complying with all the PRINCE2 requirements turned out to be tougher than expected, therefore since its introduction the methodology used by the Port of Rotterdam has moved away from PRINCE2 slowly. The official method that is used is PM@HBR (Project Management @ HavenBedrijf Rotterdam), which is still strongly based on PRINCE2. It is described in much detail and supported and used by most people. The methodology is available to all employees on the company’s intranet, and updates are regularly performed (every 6 months).

\(^5\) With ‘municipality of Amsterdam’ the IngenieursBureau Amsterdam is meant, which is the engineering department of the municipality. For the purpose of readability there will only be referred to the municipality of Amsterdam in this report.
3.6 Discussion of the findings

Throughout the orientational interviews, the interviewees elaborated on the PM methodologies that are used by their organisations, how the methodologies are described, how employees work with these methodologies and if adjustments to these methodologies are made. The results from the interviews were summarized in the previous sections. Throughout these summaries implicit adjustments where named, but not specifically highlighted. This section discusses these adjustments briefly, more discussion on all adjustments can be found in Chapter 7.

When inspecting the transcripts of the orientational interviews, 7 statements were discovered that indicate fit-for-purpose practice. These are called implicit adjustment to prevent confusion with the adjustments that resulted from the case studies that are discussed in Chapter 5. Since it concerns orientational interviews, the interview protocol was not designed to get to the bottom of each adjustment. However, adjustments were named that should not go unnoticed.

At the national government, the IPM model is used for all projects. However, Wermer (2018) stated that in some cases the project setup might slightly differ from this IPM model. Hereby smaller and regional projects are meant, where a full IPM team could be considered an overload. A similar situation was described for the province of Overijssel where the IPM model is also used. In case of smaller projects not worthy of a full IPM team, “IPM-light” is used.

Concerning the same IPM model, the waterboard Rijnland takes a different approach: projects that are too small for an entire IPM team are clustered and one IPM team is appointed for several small projects. This means that no IPM roles are combined or left out in contrast to the national government and the province as mentioned above. At the waterboard Rijnland it also occurs that there are still old fashioned project leaders (from before the reorganisation and introduction of the IPM model 2.5 years ago) who do not wish to work in an IPM team. These are mostly senior employees who have worked on projects in the traditional way for their entire career and are not willing to change that. In these few cases a small project is provided to the project leader who is allowed to perform the project to her liking and only has to report to the project manager of a cluster under which this project falls. This way the project manager of the IPM team is finally responsible for the projects in her cluster, but the project leader can organise everything to her liking.

The waterboard of Rivierenland also uses the IPM model and also has projects that are too small for an entire IPM team. In these situations, this organisation decides to go for traditional project management where one project leader is responsible. This means that there is no smaller IPM team, nor a full IPM team for a cluster of projects, but that the IPM model is set aside completely. In general it was said that waterboards often look at the Werkwijzer Aanleg of Rijkswaterstaat since that is regarded to be a proven method. However, often not all aspects described in this Werkwijzer are relevant for smaller organisations like waterboards, therefore IPM roles like the stakeholder manager e.g. are skipped entirely to make it fit the size of their projects.

The final implicit adjustment was mentioned about the municipality of Amsterdam, where the “IPM-idea” is used. This is explicitly not called the IPM model, since that organisation does not use the exact definition as described by Rijkswaterstaat. This indicates a fit-for-purpose adjustment to the organisation, although it was not further elaborated on.

3.7 Conclusion

Exploring the practice of PM methodologies was done by conducting 13 interviews with professionals working in the field of project management. They were asked the same set of interview questions, to find out what type of PM methodology is used at their current and previous working places. Questions were asked regarding the use of that PM methodology, whether it is updated and checked if project managers actually use it. From the findings it is concluded that the public clients in the Netherlands use the following PM methodologies (see Table 3):
Table 3: Summary of PM methodologies at different public clients.

<table>
<thead>
<tr>
<th>Public client</th>
<th>PM methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>National government – RWS</td>
<td>IPM + PMW</td>
</tr>
<tr>
<td>Regional government – Provinces</td>
<td>IPM + PMW, “IPM-light”</td>
</tr>
<tr>
<td>Waterboards</td>
<td>IPM + PMW/PMC, small jobs 1 PL</td>
</tr>
<tr>
<td>Local government – Municipalities</td>
<td>Small: nothing, Medium: other, Large: IPM + PMW</td>
</tr>
<tr>
<td>Semi-public government</td>
<td>PRINCE2</td>
</tr>
</tbody>
</table>

It is concluded that the national public client is very professional and experienced on project management, having refined their own developed collaboration model IPM. The IPM model is widely distributed in the Netherlands among the public client organisations (although this was not done by Rijkswaterstaat on purpose (Wermer, 2018)), and is always used as a supplement to other PM methodologies (PMW and PMC mostly). The provinces are less professional or just getting started with project management, which results in no updates on the methodologies and an “IPM-light” variation. For municipalities it could be concluded that the bigger the size, the better the project management. A small municipality does not even have a methodology, while a medium municipality has an in-house methodology that is not really used. The largest municipality uses PMW with IPM, although this is not recorded or monitored very well. Waterboards are at different levels of professionalism with project management and have different methodologies differing per waterboard.

Based on this data, the choice was made to continue this research at the level of waterboards. At waterboards different PM methodologies can be investigated and compared, also in combination with some IPM elements that are introduced by the HWBP projects. In the literature review of Chapter 4, the methodologies PRINCE2, PMW, PMC and the collaboration model IPM will be further elaborated on.

Now sub question 1 can be answered:

“What kind of PM methodologies does the public client use?”

Public clients in the Netherlands can be categorized into four levels: the national government, regional governments, waterboards and local governments. The public clients that were the subjects of the interviews differ a lot in size and professionalism regarding project management. A few different methodologies are used, mainly PMC, PMW, PRINCE2 and the collaboration model IPM. Sometimes for small projects one project leader takes care of the project. The exact division of methodologies per public client organisation can be found in Table 3.
4 LITERATURE STUDY

This chapter explores PM methods from a theoretical perspective, looking at what has been published so far within the scientific field related to this research. The literature study will create a frame of reference, and will shape the direction of this research and provide theoretical ground for the interview questions in the case study phase. What has been researched in the past? Which conclusions from previous publications can we build upon? What are recommended gaps in scientific knowledge that could be investigated? What is the knowledge gap that this research aims to fill?

The underlined aspects of this main research question have been guiding this literature search, supplemented by the use of the keywords in Table 4.

“How do the fit-for-purpose adjustments to the PM methodologies used by public clients in the Netherlands contribute to project success of infrastructure projects?”

| Project management, project management methodology, project management methods |
| Method, model, structure, concept, design, setup, framework |
| PM methods, PRINCE2, IPM, PMW, PMBoK, PMI |
| Infrastructure, construction, public space, public area |
| Public client, principal organisation, government, Rijkswaterstaat, province, waterboard, municipality, employer |
| Organisation, structure, people, employees |
| Fit-for-purpose, adaptive, adaptable, dynamic, unique |
| Project success, project success criteria, key performance indicators |

Table 4: Keywords used in the literature study.

Next to these keywords, also the snowball principle was used, a search technique where the references in an interesting article are checked, and interesting references in those articles as well. This creates a snowball effect and shows which authors and articles are often cited in the field of this research. Verschuren and Doorewaard (2010, p. 230) describe it as a search method that “goes from bibliography to bibliography”.

The only publication that theoretically compares ten different PM methodologies used in the Netherlands is the book “Wegwijzer voor methoden bij projectmanagement” by Moussault et al. (2011). The main author of this book, Ariane Moussault, was interviewed about the methods that are described in the book and was asked questions about how these methods are used in practice. The following aspects are discussed: PM methodologies in Section 4.1, adjustments to PM methodologies in Section 4.2, project success in Section 4.3 with the conclusions on this literature review in Section 4.4. This chapter aims to answer sub question 2:

“What is already known about the use of PM methodologies, their adjustments in practice and project success?”

4.1 PM methodologies

In Section 1.4.1 of the introduction chapter the definitions of a project and project management were already provided. To this the definition of ‘a PM methodology’ is added by Moussault et al. (2011, p. 7): “We describe a project management method as a systematic, well considered way of acting to achieve
PM methodologies were created according to Joslin and Müller (2015) in order to achieve better project results and be able to predict project success. This started around 1975 when they describe that governments started to implement the first PM methodologies within government agencies. In another of their publications, Joslin and Müller (2016, p. 1) again put emphasis on the fact that “project methodologies have been developed specifically to help address low success rates”. Sauser et al. (2009) state that projects do not fail for technical reasons, but that project failure often goes beyond technical reasons. Hereby they imply that project management and project management methods have influence on project success, which is the reason why PM methodologies exist in the first place. Project management techniques applied can also lead to project failure when these techniques do “not suit the project requirements or project characteristics” (Bubshait & Seken, 1992, p. 43).

Advantages that are commonly named with regard to the implementation of one PM methodology for an organisation are summarized by Payne and Turner (1999) in four aspects:

- “A consistent reporting mechanism;
- Resource requirements can be calculated on a consistent basis;
- People can move between projects;
- Small projects can be used as training ground for future managers of large projects.”

These advantages are for the organisations that formally adopt PM and PM methods.

The use of a standardized PM methodology for the entire organisation is based however on one crucial assumption, that all projects within that organisation are homogeneous and therefore the methodology is applicable to all projects (Müller & Turner, 2007). This however is often not the case (Payne & Turner, 1999). Another often used assumption is that throughout the lifetime of a project the objectives are well understood and remain unchanged (Turner & Cochrane, 1993). They argue that this is also not necessarily the case, and therefore a missed opportunity since projects with well-defined goals that can choose PM methods that match these goals have better chance of success.

The term “project management methodologies” itself is not even clear from discussion, as scientists around the world tend to use different names or mean something else when discussing PM methodologies. The interviewees of the research of Joslin and Müller (2016), preferred the word “elements” for all the parts a PM methodology is composed of, resulting in the definition they use: a methodology consists of multiple elements and multiple sub methods, together forming the methodology. The distinction between ‘methods’ and ‘methodology’ is that methods are used in specific situations, while a methodology is a combination of multiple methods and their mutual connections and relations (Joslin & Müller, 2015). Shenhar (1998, p. 33) stresses that “although there are some elements common to all projects, project management is anything but universal”, naming the same term of ‘elements’ as Joslin and Müller (2016) and addressing the fact that projects (within an organisation) are not homogeneous.

Since the rise of PM methodologies, various models have been developed all around the world. These include for example PMBoK, PRINCE, PMW, PMC, Agile, Systems Engineering...etc. Different methodologies were developed for different reasons in different sectors and at different times in different countries. Each methodology has a basic idea or philosophy from which it originates and that is the reason why it is composed the way that it is, often primarily based upon the industrial or IT sector. Payne (1993, p. 240) wrote about this basic project management idea, stressing that “it is essential to
get the choice of structure as near correct as possible”. Shenhar (1998, p. 44) confirms this by stating that the basis of a project management approach is to first identify the project type, with which “a better choice of managerial tools” can be reached. Although there are dozens of different PM methodologies, “there is no universal recipe or a singular project management method that transcends all others” (Klein, Biesenthal, & Dehlin, 2015, p. 275).

When choosing a PM methodology it is important to understand the basic idea and application area, that is why Moussault et al. (2011) wrote the book ‘Guide to project management methods’⁶. This book was written as a theoretical framework where methodologies are compared objectively with the aim of providing guidance during the selection of a PM methodology.

After selection, the methodology enters the “real world” of PM practice, which is much unlike the theory as many authors have described. It is agreed upon in literature that the practice of PM differs from the theory, and if methodologies are available that does not automatically mean they are used (Joslin & Müller, 2015).

The sub sections 4.1.1 to 4.1.4 will elaborate on a selection of PM methodologies; those mentioned by the interviewees in Chapter 0: PRINCE2, PMW, PMC and the collaboration model IPM.

4.1.1 PRINCE2

PRINCE2 (PRojects IN Controlled Environments) is a PM methodology which was developed in 1996 by the Central Computer and Telecommunication Agency (CCTA) of the British government (Hedeman, Vis van Heemst, & Fredriksz, 2009). It is a best practice based methodology, that was first used for IT-projects, but now is used for a much wider range of projects including the construction sector. The focus of PRINCE2 is the process approach of the methodology, and it does not aim to cover all aspects of project management (Moussault et al., 2011). The three aspects of specialised work, technologies and leadership qualities are not included (Hedeman et al., 2009, p. 11).

There are 7 main principles that a project needs to comply with in order to be called a PRINCE2 project (Hedeman et al., 2009, p. 19):

1. Continuous business justification;
2. Learning from experience;
3. Defined roles and responsibilities;
4. Managing per phase;
5. Management ‘by exception’;
6. Product-specific approach;
7. Tailoring the methodology to the project.

Especially this 7th principle is interesting, as project managers are encouraged to tailor the methodology to the specific project, therefore making it applicable for a variety of sectors and projects.

Moussault et al. (2011) compared 10 different PM methodologies and developed a ‘spiderweb’ per methodology, in which scores were given to certain aspects within the methodology indicating the strengths and weaknesses. In Figure 3 this spiderweb for PRINCE2 is shown, where it is visible that PRINCE2 scores high on management and goal/result, but low on leadership for example.

According to the PRINCE2 methodology, a project is successful “when all stakeholders are satisfied with the final result” (Hedeman et al., 2009, p. 5).

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⁶ Dutch title: ‘Wegwijzer voor methoden bij projectmanagement’. 
The methodology is managed by the UK Office of Government Commerce (OGC), for which the Accredited training Organizations provide education and training to obtain certifications.

4.1.2 Projectmatig Werken (PMW)

Projectmatig Werken (PMW) is a methodology that was first developed in the 1970’s by the organisation consultant Twynstra Gudde in the Netherlands, and in 1984 the first book was published. PMW was mostly used in the public sector, although the area of application has since been broadened (Wijnen & Storm, 2007). The working method lies between routine and improvisation and is therefore suitable for almost anything that needs a project-like approach. The core of PMW is control and phasing, focussing on three interwoven processes:

1. Phasing;
2. Deciding;
3. Control (Moussault et al., 2011, p. 102).

The phases of a project according to (Wijnen & Storm, 2007) are: initiation, definition, design, preparation, realisation and aftercare. Control is exercised on the GOTIK concept, which (translated) stands for money, organisation, time, information and quality, sometimes supplemented by risks or communication. These GOTIK elements form the basis of the decisions that need to be made at the end of every phase, where the decision needs to be made whether or not to continue with the project.

PMW has three principles when working with the phases (Kor, 2018, p. 6):
- Think first, then act;
- Think backwards and forward;
- Take a coarse to fine approach.

According to the PMW methodology, a project is a success when 7 criteria are met: the traditional criteria of time, money, quality (see Section 4.3 for the ‘iron triangle’), plus a satisfied client, added value, acceptance from the direct environment of the project and the extent to which the project prepares us for the future. PMW is said to be the basis for multiple other PM methodologies that are applied in the Netherlands (Moussault et al., 2011). Figure 4 shows the characteristics of PMW.

4.1.3 Projectmatig Creëren (PMC)

Projectmatig Creëren (PMC) is a methodology that was developed by the consultancy firm Kern Konsult in 1995 in the Netherlands (Moussault et al., 2011). The basis of PMC is not so much a certain sector or certain type of project, but more a philosophy on how organisations and people should work together. The commitment of all stakeholders is highly important, that is why “PMC is developed for projects for which the project success is strongly dependent on the connection that the project team members have with the project result” (Hedeman & Riepma, 2016, p. 26). Moussault et al. (2011, p. 98)
confirms this, by stating that for this methodology “people are more important than methods and systems”.

The core of PMC are the 4 ‘creation powers’, all needed in the creation process:
1. Creative power;
2. Personal power;
3. Form power;
4. Collaboration power

These four powers are embedded in the four sides: The it-side, the we-side, the I-side and the they-side, as can be seen in Figure 6 based on Bos and Harting (2006, p. 8). When these sides and powers are combined, energy from within the team can be released to power the creative process. A starting document called the ‘project contract’ serves as official start where the division of tasks for the internal client and the project team are stated: the internal client is responsible for the ‘what’, while the project team is responsible for the ‘how’.

PMC encompasses the ‘hard’ aspects of project management, but also includes the ‘soft’ side, therefore the spiderweb in Figure 5 has a balanced distribution over most of the aspects.

Phaos Organisatieontwikkeling is the company that provides the official PMC workshops and trainings and provides licences.

4.1.4 Collaboration: The IPM model

Although it is not an official PM methodology but a collaboration/organisation model, “IPM” is used at all levels of public client organisations as Chapter 0 showed.

The IPM model stands for “Integral Project Management” model, a collaboration model developed by Rijkswaterstaat in the beginning of the 21st century. Until that point Rijkswaterstaat did not have a specific PM method that they used, all project managers were free to use whatever models and methods they preferred. An internal investigation was initiated to look at 50 Rijkswaterstaat projects and their PM methods. Not surprisingly the consultancy firm Berenschot (2006) concluded that almost each of these projects had a different approach, and that some approaches were more efficient than others. Large projects that had a multidisciplinary approach scored much better on efficiency than small projects with a monodisciplinary approach, which scored the lowest. The advice of Berenschot was to further implement the IPM model that originated in 2005. Now the model that was developed by the Zuid-Holland department of Rijkswaterstaat in 2003-2004 got the name IPM and was purposefully distributed into all projects of Rijkswaterstaat.

IPM has three components (Rijkswaterstaat, 2018b, p. 14):
• The underlying idea;
• The IPM model;
• Five IPM roles.

The basic idea and essence of IPM is to “recognise and acknowledge the different interests, make an integral consideration regarding the different interests around the project, work from one integral project team and work together from different disciplines to guide the project towards good project results” (Rijkswaterstaat, 2016, p. 3; 2018b, p. 14).
In Figure 8 the IPM model with its aspects embedded in the surroundings is shown. At the top is the client that initiated the project. The lower corners indicate the environment of the project and the connection to the market. All aspects (project management, project control, stakeholder management, technical management and contract management) are held together by risk management, probably the central component of the model.

The above mentioned aspects of the IPM model are translated into five roles, resulting in a team that together covers everything that comes up during a project. These roles are: the project manager, the manager project control, the stakeholder manager, the technical manager and the contract manager (see Figure 7). The starting point of the five roles is that they are all equal (Rijkswaterstaat, 2016, p. 4). Each role is meant to be fulfilled by one person, to keep the team small and workable. Together the five IPM roles are responsible for “good interface management between the different roles, to oversee the risks involved and to focus on the middle and long-term planning of the project” (Rijkswaterstaat, 2016, p. 5). The project is managed by good collaboration between the five people in their roles working from their role responsibility. Depending on the size of the project, the IPM roles can have an extra team of employees working for them, e.g. the contract manager could have legal support staff.

Since IPM is a collaboration/organisation model rather than a PM methodology, it is not sufficient to be used on its own. Therefore it is often seen at Dutch public clients that IPM is combined with an official PM methodology that provides more detailed content and tools (e.g. PRINCE2, PMW or PMC). IPM was developed by Rijkswaterstaat (who use it in combination with PMW) and although they still provide training for the use of IPM, it is not a protected name and no official certificates can be obtained.

4.2 Adjustments to PM methodologies

The previous section about PM methodologies described what those methodologies are, where they come from, how they evolved and a few PM methodologies used by public clients in the Netherlands were highlighted in separate sub sections. This section of the literature review focusses on the adjustments to these methodologies, what existing scientific literature has to say about PM methodologies in practice, beyond what the theory prescribes. Are PM methodologies adjusted to organisations and projects? Does that happen often? If it happens, why are the adjustments made? Are there any general assumptions about fit-for-purpose PM?

PM methodologies are by definition standardised, and the advantages of standardisation within an organisation were listed in Section 4.1. This growing need and urge for standardisation has resulted in many standards worldwide with the International Standardisation Organisation (ISO, 1997, p. 15) being active since 1946. However, there is also a younger and different movement that was started by Kumar (1989) who was the first to suggest that “tailoring strategies” to certain situations might be a good idea to improve project success. A few years later Shenhar and Dvir (1996) were the first to discuss the
“adapted approach” what has since then been named ‘customization’ in project management literature. They identified that all literature on project management until then “assumed that all projects are fundamentally similar” (Shenhar & Dvir, 1996, p. 607), which they did not agree with since their results suggest that there is a wide range of variation within projects, their complexity, their technical characteristics and inherently their management.

This has resulted in two movements unofficially named ‘standardization versus customization’. “Literature is split on which of the two (or a combination of both) implies a higher chance at project success” (Joslin & Müller, 2015, p. 1379). Customization is defined by Klein et al. (2015, p. 267) as “improvisation, which describes a pragmatic approach of applying existing theories in novel ways to deliver a successful project”. With this they clearly state that customization has a basis in existing theory, it is not a completely new method but just the use of different parts of the methodology that seem best fit for the purpose of that unique project.

More than a few authors have chosen the side of customization (Joslin & Müller, 2015, 2016; Klein et al., 2015; Müller & Turner, 2007; Payne & Turner, 1999; Sauser et al., 2009; Shenhar, 2001). Although recent publications predominantly favour customization, voices that opt for standardisation can still be heard and research is performed into the implications of standardised project management (Milosevic & Patanakul, 2005).

Focus within the customization literature is based mostly on three things:

- Making the methodology specific for the organisation;
- Adapting the used methods to a specific project;
- Different levels of methodology adaptation within a single organisation.

Each of these will be discussed, to provide a complete overview on the literature about adjustments, also concluding on the missing elements that this research will focus on.

The research of Sauser et al. (2009, p. 677) suggests “that organisations would benefit from developing their own organizational-specific frameworks”. This means that the chosen methodology should be made more directly applicable to the organisation it is used in. If a methodology for the organisation is missing or incomplete, Joslin and Müller (2015) showed that this will have a negative influence on project success. Also it turns out that having a PM methodology is not the same as actually using it, which gives better results according to Joslin and Müller (2015).

Payne and Turner (1999, p. 55) showed that “people more often report better results for their projects when they tailor the procedures to the type of the project they are working on, matching the procedures to the size of the project, or the type of resource working on the project”. Even when there is an ‘in-house’ PM methodology that is supposed to be suited to the organisation, still 27% of the respondents of the study of Fortune et al. (2011) indicate that they experience limitations in using this in-house methodology. This again calls for customization to the level of the project itself. It is confirmed by Wells (2012) that organisations often choose or develop a methodology for the entire organisation, while not looking at the needs of the individual projects. Therefore he argues that project managers will still tailor the methodology to their own project, even if it is already an ‘in-house’ developed methodology. The research of Shenhar (2001) demonstrates that the management and entire organisation should steer towards a more project-specific approach, since there is usually no clear project typology analysis beforehand, and therefore no conscious adjustments can be made. He argues that organisations should add “a formal step of project classification to the traditional planning phase” to make the customization more structured and better suited to the project (Shenhar, 2001, p. 412).

Payne and Turner (1999) agree with the standardisation of PM methods within one organisation, although their main argument is that this should not be viewed the same way in different layers of the
organisation. They opt for a common approach on strategic level, but want to “allow different projects to adopt different approaches at the detail or tactical level” (Payne & Turner, 1999, p. 57).

They conclude with the following three levels:
1. The integrative level, where a project definition report is composed, and projects have a common model and common basis (also to ensure a consistent reporting mechanism as described in Section 4.1).
2. The strategic level, which includes “a milestone plan and project responsibility chart”.
3. The tactical level, where methods can be “chosen based on the nature of the project”.

This tactical level is exactly where the project specific adjustments happen, and this explanation constructs the bridge between organisational customization and project-specific customization as earlier discussed. Wells (2012) confirms this when concluding that there is a difference in perception of the PM methodologies at different layers in the organisation, stating the ‘strategic level’ and the lower ‘project and operational level’.

Although the literature recognises the need for customization, and multiple studies have been performed into the presence of adjustments in projects relating to PM methodologies, only one research comes closer to the question what these adjustments exactly are and why they are made. Fortune et al. (2011, p. 553) wanted to “capture the “real world” experiences of people in project management” and did so for the countries Australia, Canada and the UK. They used a quantitative research methodology with a questionnaire (including open answer questions) that resulted in 150 respondents, 50 from each country. Different tools and techniques were discussed, which mainly indicate which methods are used and how often. They confirm the findings of Morris, Crawford, Hodgson, Shepherd, and Thomas (2006) that project managers are becoming more and more professional in terms of the used tools and techniques. However, Fortune et al. (2011) state they wanted to investigate the ‘real world’ of project managers and did so by discussing the limitations that PM methodologies entail, but they did not find out how the real world of adjustments to PM methodologies works, since that was not the main focus of their research. This leaves open an opportunity to investigate adjustments to PM methodologies used in practice, for the context of public clients in the Netherlands.

4.3 Project Success

Project success is considered the holy grail of project management. Everybody strives for it, wants their project to be a success and weighs all decisions during a project to increase the chance at success. But do those project managers even know what project success exactly entails? This section describes project success, provides a historical overview and concludes on the success criteria that will be used throughout this research. Studying project success as a topic itself could take years, therefore regarding the time scope of this research this section is limited to the most important findings in literature so far.

The term ‘project success’ is widely debated and hundreds of studies have been conducted throughout the past decades. The definition of project success has changed substantially, if there even was a generally accepted definition to begin with. Pinto and Slevin (1988, p. 67) stated that the concept of project success was ambiguous and “projects are often rated as successful because they have come in on or near budget and schedule and achieved an acceptable level of performance”. Here Pinto and Slevin (1988) name the three aspects of the well-known iron triangle of time, cost and scope (Atkinson, 1999). Although these aspects are definitely important, it does not yet cover everything project success is about. This iron triangle is still important for the definition of project success, but the recent study of Koops, Bosch-Rekveldt, Coman, Hertogh, and Bakker (2016) concluded that none of their interviewed
public project managers ranked the iron triangle criteria all in the top 3 for most important project success criteria.

The research of Davis (2014) revealed that Pinto and Slevin (1988) are the most cited authors concerning the assessment of project success, but additions to their definition have been made since then, like the research of Koops et al. (2016) indicate. In her research Davis (2014) sketches an historical overview, concluding that the 1970s focussed most on the technical aspects and communication with clients, the 1980s and 1990s looked more at the relation to the client organisation, in the 1990s and 2000s frameworks for critical success factors were developed, while the 21st century focusses on all of the above but also on all involved stakeholders.

Before having a closer look at what project success is exactly about, there is an important difference that needs to be stated, between “project success” and “project management success”. This difference has to do with the scope and lifetime of the entire project itself, or just the part of the lifetime where project management is involved. Munns and Bjeirmi (1996) indicated in their publication these two scopes of success, where project success covers all phases (conception, planning, production, handover, utilization, closedown), while PM success covers only planning, production and handover.

Project success is not the same as project management success as has been stated, Baccarini (1999) made a clear division between ‘project management success’ and ‘project product success’. Project management success has a scope limited to the realisation of the project. Project success on the other hand has a much longer scope, since it also includes the utilisation of the project (e.g. the use of a building for 100 years until demolishment). This second scope of project success is too large for this research, investigating this would only be possible after the entire lifetime of the project. Therefore the scope of project success that is used in this research refers to the scope of ‘project product success’. According to Van Der Westhuizen and Fitzgerald (2005) project product success “fockuses on the effects of the project’s end-product”. It is about the project itself (not about its management) but limited to the project delivery date. Figure 9 shows the differences in scope of the terms ‘project success’, ‘project management success’ and ‘project product success’, from initiation to handover and eventually the demolition.

Van Loenhout (2013, p. 8) describes the distinctions in scope clearly by providing a few examples including “it is imaginable that a project that was delivered too late and which costs exceeded the budget, still satisfies its users in its implementation phase: simply dismissing this project as a failure would therefore be a mistake”. A real life example is the famous Sydney Opera House, which had an estimated budget of A$ 7 million and schedule of 5 years. Problem after problem occurred and eventually the building opened 16 years later with total costs of over A$ 100 million (Shenhar & Dvir, 2007). Clearly the project management of the Sydney Opera House was a failure, however, it cannot be said that the project itself is not successful as it is one of the best known buildings in the entire world, spiking tourism to the city of Sydney and being a landmark for the entire continent.
This does however not mean that project management has no influence on project success at all, as Munns and Bjeirmi (1996, p. 82) state: “Project management plays a role in project success but that role is affected by many other factors outside the direct control of the project manager”. This is confirmed by the PhD research of Van Aken (2009) who concluded that tools, methods and instruments are not the most important for project success. On the contrary, “working styles are the most important explanation of project success, performed by the project leader and his team” (Van Aken, 2009, p. 125). His research also shows that for tangible projects (this can be compared to low on complexity) the use of too much tools actually hinders project success, while for intangible projects (this can be compared to high on complexity) more structuring is desired to reach project success. Therefore it can be stated that tools and methods play a role in project success, but that this role is limited and not the most prominent influencer of project success.

When assessing project success, two components are distinguished: success criteria and success factors. “Criteria are a set of principles or standards by which judgement is made; whereas factors are the set of circumstances, facts, or influences which contribute to the result” (Lim & Mohamed, 1999, p. 243). More recently Müller and Turner (2007, p. 299) defined success criteria in a similar way being “the measures by which we judge the successful outcome of the project; these are dependent variables which measure project success”. They describe success factors as “elements of a project that can be influenced to increase the likelihood of success; these are independent variables that make success more likely”.

From these definitions it becomes clear that when assessing project success, the focus of this research will be on the success criteria as this is the measure by which we assess if a project is successful or not. Project management and PM methodologies can be seen in this context as factors that contribute to project success, while the project success itself is measured by project success criteria. This is confirmed by Joslin and Müller (2015, p. 1388) who found that the contribution of PMM [project management methodologies] elements “collectively account for 22.3% of the variation in project success”. Thereby they labelled PMM as a contributing factor for project success.

Another aspect of project success that needs to be taken into account is the perspective from which project success is assessed. The views of the client, contractor and stakeholders can be very different, and sometimes a project can be seen as a success by one stakeholder while simultaneously being experienced as unsuccessful by another stakeholder (Joslin & Müller, 2016). The research of Koops et al. (2017) focusses more on the perspective of the Dutch public project manager, concluding that public project managers mostly focus on time or budget, only two of the iron triangle success criteria. That research is in line with the findings of Bakker et al. (2010), who have come to a ranking of project success criteria, which can be easily and binarily quantified into ‘yes successful’ or ‘no not successful’.

Since this research does not aim at redefining the concept of project success, nor to formulate a new set of important success criteria, the findings of Bakker et al. (2010) will be used throughout this research. Table 5 provides these success criteria, supplemented by an elaboration in the second column on what that criterion means within the context of this research.
1. No accidents | No accidents means no lost time injuries or deaths during the construction of the project, referring to the overall physical safety.

2. Happy client | The client who initiated the project should be happy with the final outcome of the project.

3. Budget | This is one of the criteria from the classical iron triangle, whether the project was finished within budget.

4. Quality | This is also one of the criteria from the iron triangle, whether the desired quality of the end result is realised.

5. Schedule | Time is the third and last criterion of the iron triangle, whether the project was realised on schedule.

6. Start up | Start-up refers to start-up of production, or in other words the start of beneficial use, can the end result be handed over to management.

Table 5: Success criteria based on Bakker et al. (2010).

4.4 Conclusion

PM methodologies were created to achieve better results and predict project success (Joslin & Müller, 2015, 2016), and are per definition standardised. PM methodologies are proven to contribute to project success, and four main advantages of PM methodologies used by organisations were reported by Payne and Turner (1999). Problems may arise when the PM methodology used does not suit the project characteristics (Bubshait & Seken, 1992; Moussault, 2018), potentially leading to costly management errors (Sauser et al., 2009). The crucial assumption regarding PM methodologies, is that all projects within one organisation are homogeneous (Müller & Turner, 1999; Shenhar, 1998). There is also no ‘best’ PM methodology (Klein et al., 2015; Moussault et al., 2011), it all depends on the underlying ideas, and choosing the PM methodology that suits your project (Payne, 1993; Shenhar, 1998). PRINCE2, PMW, PMC and IPM were elaborated on in sections 4.1.1 to 4.1.4, providing a theoretical framework for the case studies to come.

The need for standardisation has its origins in the second half of the 20th century, while a much younger movement voices the need for adjustments to these standard PM methodologies (Kumar, 1989; Shenhar & Dvir, 1996). Two movements arose, unofficially named ‘standardisation versus customization’, from which the latter has previously been named “tailoring strategies” and the “adapted approach”. Regarding the customization of PM methodologies, literature focusses mostly on three different aspects: the organizational-specific frameworks (Joslin & Müller, 2015; Sauser et al., 2009), customization to the level of the project itself (Fortune et al., 2011; Payne & Turner, 1999; Shenhar, 2001; Wells, 2012), and different levels of PM methodology customization within one organisation (Payne & Turner, 1999; Wells, 2012). These different levels that Payne and Turner (1999) conclude on, are the integrative, strategic and tactical level. However, no studies have been conducted into what this customization exactly means, what these adjustments are or should be, why they are made and what this contributes to project success.

The term ‘project success’ has been widely debated, and started out at first with the iron triangle of time, cost and scope (Atkinson, 1999). Although these criteria remain important, none of the respondents of Koops et al. (2016) ranked them top three. This is because the term ‘project success’ has evolved since the 1970’s and different areas of focus have been added (Davis, 2014). Koops et al. (2017) concluded that Dutch public project managers mostly focus on time and budget, only two of the iron triangle success criteria.

Project success may be confused with project management success, but these terms are not the same since their scope in the entire life cycle of the project is different (Munns & Bjeirmi, 1996; Van Loenhout, 2013), for this research the scope of project product success is chosen as described by Van Der Westhuizen and Fitzgerald (2005) and shown in Figure 9. When assessing project success it is also important to distinguish project success criteria from project success factors (Lim & Mohamed, 1999; Müller & Turner, 2007). Criteria are the set of principles and standards to measure success, and factors
influence or contribute to success. This research does not aim to redefine project success, therefore the six project success criteria of (Bakker et al., 2010) provided in Table 5 on page 28 will be used throughout this research.

This literature review raises a few expectations regarding the outcome of the case study phase:

- It is expected that overall the project managers will need and use customization in the day-to-day business of the project.
- It is expected that the organisation-specific PM methodologies at the public client (the guidelines) will only go a certain length, that after a certain point it is more dependent on the project manager and the people in her team.
- It is expected to reveal why adjustments are made and on which success criteria they have impact, thereby what their contribution to project success is.

Now sub question 2 can be answered:

“What is already known about the use of PM methodologies, their adjustments in practice and project success?”

PM methodologies were created to achieve better project results and are per definition standardized. Multiple PM methodologies exist, developed in the past decades and described in books and by organisations. There are two movements, from which one advocates that adjustments need to be made to make the PM methodology fit-for-purpose to an organisation and to the projects themselves (the other believes in standardization where no adjustments are necessary). However, no studies have been conducted so far into what these adjustments actually are, which leaves open the opportunity for this research. Adjustment are said to contribute to project success, for which different definitions have been used since the 1970’s. This research will use the success criteria formulated in the research of Bakker et al. (2010).
PART THREE

Case studies
Analysis & Evaluation
5 CASE STUDIES

From the exploratory phase in Chapter 0 it was concluded to continue this research at waterboards in the Netherlands. This chapter will delve into the case studies, first elaborating on the goal of the case studies (Section 5.1), the case selection (Section 5.2), after which the selected cases will be described (Section 5.3) and results will be stated (Section 5.4). This chapter will describe the empirical data collection that will form the input of the data analysis in Chapter 6, and will formulate an answer to sub question 3:

*What adjustments are made to the PM methodology to make it more fit for the purpose of a specific project?*

5.1 Goal of the case studies

The goal of the case studies is to do research in the field, to discover new aspects relating to this topic that will help to answer the research questions. The reason why case studies were chosen as a research methodology were already explained in Section 2.1. In order to do this field research, 6 cases were selected at 3 different waterboards, and all the involved project managers as well as their internal clients were interviewed, this resulted in 11 interviews (one internal client was responsible for two projects) and 2 additional interviews. The interview protocols can be found in [Fout! Verwijzingsbron niet gevonden.](#) on page [Fout! Bladwijzer niet gedefinieerd.], and the transcripts are digitally available upon request.

5.2 Case selection

From the practical exploration in Chapter 0 it was concluded to continue the research at the governmental layer of waterboards in the Netherlands. All their work and projects are related to the physical environment and mostly in the form of infrastructure. When setting up the criteria for the case selection, it became clear that it would be good to investigate multiple projects (in the range of 4-6) in order to better be able to draw conclusions about the influence of fit-for-purpose adjustments on project success (if 1-3 cases would be investigated it is more difficult to draw valid conclusions). It was also chosen not to investigate all projects at different waterboards, since the differences between waterboards (the methodologies used, the size, maturity, organisational culture ...etc) would possibly cause too much noise in the analysis to come to solid scientific conclusions.

The choice was made to look into 6 projects, divided over 3 waterboards, and per waterboard it was chosen to look into one “HWBP” project and one regular project. HWBP stands for “hoogwaterbeschermingsprogramma” which indicates that the project is relatively large and complex and was commissioned not only by the waterboard itself but also by Rijkswaterstaat (more on HWBP at the end of this section). Not all of the 21 waterboards in the Netherlands participate in the HWBP, since they don’t all cope with water problems on such a scale or those problems don’t have the highest regional priority. From the waterboards that do participate three waterboards were selected that do not have the same PM methodology, since this could provide more insight in the adjustments and influence on project success than just one type of PM methodology.

Next to this some pragmatic selection criteria were used as well, mostly about the availability of project data and time and willingness of involved project managers and internal clients for interviews. An interview protocol was created for the project managers and a different interview protocol was created for the internal clients (see [Fout! Verwijzingsbron niet gevonden.](#) on page [Fout! Bladwijzer niet gedefinieerd.])

The same questions were asked where possible, for the project manager more specific questions were asked about adjustments to the PM methodology and for the internal client more questions were asked about the methodology and guideline at the organisation. The categories of questions for the project managers were: background, introduction on the use of the guideline, general questions about adjustments, the specific questions per adjustment ‘what, why, project success’, general why questions and general success questions. For the internal clients the categories of questions were: background, methodology, what, why and project success.

The subject of the projects itself varies, since it was not feasible to find 6 identical projects. Everything ranging from dikes to roads, sluices, water pumping stations and bridges was indicated as optional to the participating waterboards, with the exception of water purification installations since those type of projects differ a lot. For each project it is important that it is (almost) finished, since the project success part of the main question can’t be answered if a project is still in the initiation phase.

To summarize, the criteria on which the waterboards and projects were selected are:

- Three different waterboards;
- Three different PM methodologies used at those waterboards;
- The waterboards need to participate in the HWBP;
- Per waterboard one HWBP project would need to be available and one regular project;
- The subject of the projects could be dikes, roads, sluices, dredging activities, water pumping stations, bridges and other civil infrastructures, with the exception of water purification installations;
- The projects would need to be already finished, or almost finished (in the final phases of transmission to management or in evaluation);
- Project data needs to be available, as well as the described organisation-specific PM methodology of the waterboard.
- The project manager as well as the internal client of each potential project would need to be available for an one hour interview.

The ‘Hoogwaterbeschermingsprogramma’ (HWBP, highwater protection programme) is a programme within the Dutch Delta programme, where “state and waterboards work together intensively to protect the Netherlands from flooding” (Ministerie van Infrastructuur en Milieu, 2016, p. 7). The emphasis is on the word ‘programme’, as it does not have a clearly defined goal, time span or budget.

“The difference between a project and a programme is that the objectives of a programme are less specific and longer term” (Turner & Müller, 2003, p. 7). The HWBP has an evolving character, which means that every year an update is made for the next six years to come. Some projects will be in execution, while new projects are added, always working with prioritization of the list of all projects based on urgency. The responsibility for the entire programme lies with the Ministry of Infrastructure and Environment, while the responsibility of the individual projects lies with the waterboards. The most important agreement between the state government and the waterboards is that 90% of the total project budget is available as subsidy, 10% needs to be paid by the waterboard.

5.3 Case descriptions

For the purpose of anonymity of the waterboards, the selected cases and the interviewees are coded. The link between the codes and waterboards/cases/interviewees is only known to the author. Per case a short summary will be provided in the following sub sections (5.3.1 to 5.3.3) that serves as context.

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7 The three different waterboards are indicated as WB1, WB2 or WB3. After that, the letter A stands for the HWBP project of that waterboard, letter B indicates that it was a regular project of the waterboard. The interviewed project managers and internal clients are indicated with an additional “-PM” or “-IC”. Example: Interviewee “WB2A-IC” is the internal client for the HWBP project of the second waterboard.
Because the focus of this research is not the projects themselves but the PM methodologies and adjustments to those methodologies in practice, the descriptions are rather general. The elements that are included in the descriptions are: the PM methodology used by the waterboard, the subject of the project, the budget, timespan, categorized complexity (low-medium-high), contract type and whether or not it is a HWBP project. Also for reasons of anonymity some elements will be categorized, like the finances and time in different steps (e.g. €0-5 million, €5-10 million and time 0-1 year, 1-2 years). The background information on the interviewees can be found in Fout! Verwijzingsbron niet gevonden, on page Fout! Bladwijzer niet gedefinieerd.

5.3.1 Cases WB1- A & B

Waterboard 1 uses the PM methodology of PMC, supplemented by the IPM collaboration model. These methodologies were already shortly described in sub sections 4.1.3 and 4.1.4. This PMC is described for the organisation in an internal guideline named “handboek projectmatig werken” (which is not the best name for it, since Projectmatig Werken is also another official methodology as discussed in Section 4.1.2). Next to this handbook they have a description of the IPM roles (WB1, 2016), containing tasks and competences for all five IPM team members, with the addition of tasks and competences for the internal client. Both of these guidelines are available on the intranet page of the waterboard. This waterboard also has an employee who focusses fully on quality management of the internal procedures and methodology of the project department. An additional interview was conducted with this Qualitymanager-WB1 (2018) of which the transcript is also digitally available upon request.

Case WB1A
This project is a HWBP project, with dike reinforcement as subject. The focus of this project was to meet the new safety standards for the dike. The budget for this project was €20-25 million under an UAV-GC contract, with a time span of 2-3 years. Due to different dike sections and the time as well as financial scope, this project is categorized as ‘high’ on complexity. For this case study, interviews were conducted with interviewees WB1A-PM (2018) and WB1A-IC (2018). This project is currently being finished, final elements are checked before handover to management.

Case WB1B
This project was a regular project of the first waterboard, with the renovation of a water pumping station as subject. The focus of this project was mostly on time, since all the work needed to be done between the months of May and September when the pumping station needed to be fully functioning again. The main task was to replace the old diesel engines by electromotors. The budget for this project was €5-10 million under a traditional RAW contract, with a time span of 2-3 years. For this project most of the activities were performed by the contractor, and although it was time driven, this project is categorized as ‘medium’ on complexity. For this case study, interviews were conducted with WB1B-PM (2018) which were the current project manager and a previous project manager (their comments are in the same transcript) and with interviewee WB1B-IC (2018). This project was recently finished, and has just been handed over to management.

5.3.2 Cases WB2- A & B

Waterboard 2 uses the PM methodology of PRINCE2, which was already shortly described in sub section 4.1.1, supplemented with the collaboration model IPM. The descriptions of both PRINCE2 and IPM can be found on their intranet page, where there is a system of one pdf page with the organisational model and PM methodology elements. On each element it is possible to click, after which a folder opens with all relevant documents, templates, examples and additional information. The “handleiding project management” (WB2, 2014) is placed in the folder of the project manager since the project manager is responsible for the organisational embedding and management methodology of the project, and
consists of an elaboration on how PRINCE2 is used within this waterboard. Next to this there is also an extra document on how to apply PRINCE2 on less complex projects (WB2, 2011).

Case WB2A
This project is a HWBP project, with a dike reinforcement as subject. The focus of this project was to meet the new safety standards for the dike, and safety was considered top priority. The budget for this project was €30-35 million under an UAV-GC contract, with a time span of 2-3 years. Due to different dike sections and the time as well as financial scope, this project is categorized as ‘high’ on complexity. For this case study, interviews were conducted with interviewees WB2A-PM (2018) and WB2A-IC (2018). This project is currently being finished, final elements are checked before handover to management.

Case WB2B
This project was a regular project of the second waterboard, with the renovation of a sluice as subject. The main task was to replace the installations of the sluice which were too old and unreliable, including the electrical, hydraulic and mechanical parts. The budget for this project was €0-5 million under an UAV 2012 contract, with a time span of 2-3 years. Due to the budget and required activities, this project is categorized as ‘low’ on complexity. For this case study, interviews were conducted with interviewees WB2B-PM (2018) and WB2B-IC (2018). This project is completely finished, and has been handed over to management.

5.3.3 Cases WB3- A & B

Waterboard 3 uses an in-house PM methodology that they have developed after the merger of several waterboards from that area into the current waterboard. This PM methodology is written down in a document called “Handboek projectmanagement [WB3]” (WB3, 2012) which counts 34 pages but is also summarised into a 5 page and 2 page summary. This waterboard has a digital copy available on their intranet page, but there is no system like WB1 and WB2 have, where you can click and get links to templates or example documents.

Case WB3A
This project is a HWBP project, with the subject of a coastline reinforcement including dunes, dikes and spatial planning. The focus of this project was to integrate all these components and realise a marina while still meeting all the safety requirements. The budget for this project was €35-40 million under an UAV-GC 2005 contract, with a time span of 3-4 years. Due to all these different components, working together with three different stakeholders and the total costs, this project is categorized as ‘high’ on complexity. Also it was the first time the employees of this waterboard were working with the IPM model, which might be introduced to the entire organisation later this year. For this case study, interviews were conducted with interviewees WB3A-PM (2018) and WB3A-IC (2018). This project is completely finished, and has been handed over to management.

Case WB3B
This project is a regular project of this waterboard, with the subject of dredging a several kilometer waterway. The focus of this project was on the technology used to protect the shores, and the involvement of farmers from the area. The budget for this project was €0-5 million, with a time span of 1-2 years. Due to the repetitive character of the project and its financial scope, this project is categorized as ‘low’ on complexity. For this case study, interviews were conducted with interviewees WB3B-PM (2018) and WB3B-IC (2018). This project is mostly finished, the dredging is completed, and the extracted land must dry over the coming summer season before it can be reused and the project is officially completed.
5.4 Case results

From the interviews and the study of the guidelines and case documentation, results were found that will be elaborated on in this section, followed by the cross case analysis in Chapter 6. The results are facts that were discovered when researching these 6 cases, and these results are grouped per waterboard since aspects regarding the PM methodology and project success are more general for the entire organisation.

Regarding adjustments, a distinction is made between organisation-specific adjustments and project-specific adjustments. These adjustments can be seen as relationship X and relationship Y in Figure 10. The first type of adjustment is concerning the adjustments from official theory to the organisation-specific methodology (relationship X) as mentioned by Joslin and Müller (2015) and Sauser et al. (2009) and discussed in Section 4.2 on page 23. The second type of adjustment is the customization from the organisation-specific methodology (relationship Y) to the level of the project itself, mentioned by Fortune et al. (2011), Payne and Turner (1999), Shenhar (2001) and Wells (2012) and also discussed in Section 4.2 on page 23.

![Figure 10: Organisation-specific and project-specific adjustments (relationship X and Y).](image)

Project-specific adjustments were discovered in two types: directly and indirectly. The direct adjustments were the answers of the project managers to questions 10, 11 and 12 of the interviews. After transcribing all interviews, some additional adjustments were found in the transcripts, adjustments that were done but not specifically mentioned as answers to the three questions. Regarding the discovered project-specific adjustments it will clearly be stated from which case they originate, and also if it is categorized as direct or indirect.

5.4.1 Results WB1- A & B

The PM methodology used at waterboard 1 is PMC with the addition of the IPM collaboration model. Findings regarding this PM methodology include:

- The project governance is based on finance and financial related reporting.
- In the case that a project is too small for an entire IPM team to work on it, this organisation chooses to bundle multiple small projects and appoint one IPM team (rather than sizing down the project team to less than 5 people by combining IPM roles).
- After tender when the budget of the project is set, the project manager has a financial mandates when it comes to changes to the work that need to be signed for. At waterboard 1 this mandate is €100,000.-
- At this waterboard a course about the PM methodology (PMC) is mandatory for all employees working at the project departments, an additional course on top of the basic course is optional for project managers or other interested employees.

The organisation-specific methodology of this waterboard is described in the guideline. The guideline of WB1 is an intranet environment were one overview is created that contains the project phases and most important relations and documents, which is elaborated on in the following 53 slides. These slides contain detailed flowcharts on the steps per topic, often accompanied by templates and formats. This guideline ‘main process guideline working with projects according to the PMC phases’ WB1 (2018) consists only of flowcharts, no textual elaboration on the methodology is provided. These flowcharts
have different revision dates, consistent with the most recent update of the processes as discussed in the knowledge networks and written down by the quality manager.

Project-specific adjustments can be found in Table 6:

<table>
<thead>
<tr>
<th></th>
<th>The adjustment</th>
<th>(In)direct</th>
<th>Reasons mentioned</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBA1</td>
<td>1 Next to the financial mandate, the time mandate was defined for this project.</td>
<td>Direct</td>
<td>To be able to act quickly.</td>
</tr>
<tr>
<td></td>
<td>2 The report of the execution phase is still in draft, because nobody asks for it.</td>
<td>Direct</td>
<td>Nothing specific, maybe save time.</td>
</tr>
<tr>
<td></td>
<td>3 Not waiting for the results of research, taking a small risk.</td>
<td>Direct</td>
<td>Save time.</td>
</tr>
<tr>
<td></td>
<td>4 The milestone 'start of execution' was rephrased in order to meet the deadline.</td>
<td>Indirect</td>
<td>-</td>
</tr>
<tr>
<td>WBB1</td>
<td>5 Shared risk register with the contractor.</td>
<td>Direct</td>
<td>Awareness of risks, time and troubles saved.</td>
</tr>
<tr>
<td></td>
<td>6 Additional financial mandate when the project went over budget (€100,000,- extra available from the €500,000,- risk budget).</td>
<td>Direct</td>
<td>To be able to act quickly, save time.</td>
</tr>
<tr>
<td></td>
<td>7 The IPM role of the stakeholder manager was distributed among the project team.</td>
<td>Direct</td>
<td>Efficiency: time and money</td>
</tr>
<tr>
<td></td>
<td>8 The contract manager did the planning</td>
<td>Direct</td>
<td>Efficiency</td>
</tr>
</tbody>
</table>

Table 6: Project-specific adjustments at waterboard 1.

Project success at this waterboard is not specifically defined; this waterboard does not have any organisation wide project success criteria. Mostly project managers have to choose time, budget or quality as main focus point. Some lists of attention exist, including more and more the safety on the project site as factor. Collaboration internally as well as externally is deemed important and for some projects success criteria involving environmental support and sustainable solutions might be included.

- **WB1A:**
  - How you frame project success makes a difference in the perception of success and the achievements (the ‘start of execution’ was reframed to meet the milestone deadline).
  - Starting the construction in 2016 was a very important milestone, apart from that there were no project specific success criteria.

- **WB1B:**
  - The main focus of this project was to achieve the deadline.
  - The shared risk register was of great importance to the success of this project, for both the collaboration and meeting of the deadline.

### 5.4.2 Results WB2- A & B

The PM methodology used at waterboard 2 is PRINCE2 with the addition of the IPM collaboration model. Findings regarding this PM methodology include:

- In the case that a project is too small for an entire IPM team to work on it, this organisation chooses to bundle multiple small projects and appoint one IPM team (rather than sizing down the project team to less than 5 people by combining IPM roles).
- After tender when the budget of the project is set, the project manager has a financial mandates when it comes to changes to the work that need to be signed for. At waterboard 1 this mandate is €50,000,-.
At this waterboard a course about the PM methodology (PRINCE2) is mandatory for all employees working at the project departments, and an additional course on top of the basic course is mandatory for project managers.

The organisation-specific methodology of this waterboard is described in the guideline. The guideline of WB2 is an intranet environment where all forms, formats, examples and rules are gathered. There is one overview page of the project organisation that has links to every subject. In the folder of the project manager there is a document called ‘instructions project management’ (WB2, 2014), which is 14 pages and consists of the main overviews of project organisation, project control, project phases...etc. This document is mostly consistent with the PRINCE2 theory as described by Hedeman et al. (2009) in their book ‘Project management on basis of PRINCE2’, and some pages even literally follow the order of the chapters in the book. The figures and flowcharts are copied and consistent with the content of the official theory.

Project-specific adjustments can be found in Table 7:

<table>
<thead>
<tr>
<th></th>
<th>The adjustment</th>
<th>(In)direct</th>
<th>Reasons mentioned</th>
</tr>
</thead>
<tbody>
<tr>
<td>WB2A</td>
<td>1  This project had a shared risk register with the contractor</td>
<td>Indirect</td>
<td>-</td>
</tr>
<tr>
<td>WB2B</td>
<td>2  General adjustment: First look what you need from the methodology and guideline, only use that.</td>
<td>Direct</td>
<td>Time, bureaucratic overkill</td>
</tr>
<tr>
<td></td>
<td>3  General adjustment: Skipping, combining or stretching phases if necessary.</td>
<td>Direct</td>
<td>Time, unnecessary documentation</td>
</tr>
</tbody>
</table>

Table 7: Project-specific adjustments at waterboard 2.

Project success at this waterboard is not specifically defined; this waterboard does not have any organisation wide project success criteria, not in the guideline nor in formats. Time, budget and quality is the main focus of the waterboard, success criteria you could say that PRINCE2 controls. In general, staying within the tolerances provided by the internal client is deemed to be success. Although no official criteria are present, the image of the waterboard to the outside world is very important, and the general water safety of the region of the waterboard is the ultimate goal. This is mentioned by WB2B-IC as the goal of the project, if it does not fulfil its goal, what is the use of the result? The happy client as mentioned by (Bakker et al., 2010) is the happy senior user in the PRINCE2 methodology, but mostly the focus of this waterboard is on budget, staying within that budget makes the board the happiest (unofficially).

- WB2A:
  - Project success according to interviewee WB2A-PM is in the basics: “Do you know each other, do you trust each other, do you have the same goal in mind? It’s about people, attitude and behaviour.”
  - There were no project specific success criteria mentioned in the PID.

- WB2B:
  - Sometimes the PID includes the question ‘when are we satisfied?’, but otherwise there are no specific success criteria in the PID.

5.4.3 Results WB3- A & B

The PM methodology used at waterboard 3 is an in-house methodology that was developed by the own organisation, based on best practices and the working methods that were already present. Project
WB3A was a HWBP project, therefore the IPM model was used as well (project WB3B, only used the in-house methodology). Findings regarding this PM methodology include:

- The project governance is based on finance and financial related reporting.
- After tender when the budget of the project is set, the project manager has a financial mandate when it comes to changes to the work that need to be signed for. At waterboard 3 this mandate is €0,-.

The organisation-specific methodology of this waterboard is described in the guideline. The guideline of WB3 is a document that the waterboard itself produced. It is a combination of some elements of previous methodologies by the smaller waterboards before the merger in 2005, with best practices added and combined.

Project-specific adjustments can be found in Table 8:

<table>
<thead>
<tr>
<th></th>
<th>The adjustment</th>
<th>(In)direct</th>
<th>Reasons mentioned</th>
</tr>
</thead>
<tbody>
<tr>
<td>WB3A</td>
<td>1 IPM roles were used for the first time.</td>
<td>Direct</td>
<td>Try-out for the rest of the waterboard.</td>
</tr>
<tr>
<td></td>
<td>2 Additional financial mandate for small things (€0,- to €10,000,-)</td>
<td>Direct</td>
<td>Prevent more delays</td>
</tr>
<tr>
<td></td>
<td>3 The entire organisation structure of this project was different than usual, since this was a HWBP project in combination with the municipality and harbour club. They had their influence on the methodology as well, therefore the guideline of the waterboard was almost not influential.</td>
<td>Indirect</td>
<td>-</td>
</tr>
<tr>
<td>WB3B</td>
<td>4 Skipping a phase, combining the documentation.</td>
<td>Direct</td>
<td>Time mostly</td>
</tr>
<tr>
<td></td>
<td>5 The budget plan and design statement were merged into one document, skipping the design phase.</td>
<td>Indirect</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 8: Project-specific adjustments at waterboard 3.

Project success at this waterboard is not specifically defined; this waterboard also does not have any organisation wide success criteria written down in the guideline. The overall duty of the entire organisation is to perform well, the outside image is important for the perception of success. Currently, the organisation is working on specifying performance indicators, that could function as success criteria that measure project success in the near future.

- **WB3A:**
  - There were no project specific success criteria.
  - The most important was to stay within budget.
  - Project success also includes the collaboration with the other parties, but this was not written down anywhere.

- **WB3B:**
  - For this project it was important that the environment should not experience any hinder.
Based on the results of this case study chapter, sub question 3 can now be answered:

“What adjustments are made to the PM methodology to make it more fit for the purpose of a specific project?”

There are multiple adjustments of different natures made to the PM methodologies the waterboards use. These can be split into the direct and indirect adjustments: adjustments explicitly named by the interviewees when answering certain interview questions and adjustments that were mentioned when reading between the lines. These adjustments range from additional financial mandate, to shared risk registers and skipping phases or phase documentation. The complete list of adjustments can be found in Table 6, Table 7 and Table 8 on pages 37, 38 and 39 and will further be discussed in Chapter 6.
6 ANALYSIS & EVALUATION

After the previous chapter that described the cases and the results of the case studies, it is now time for the analysis. This chapter will describe the cross case analysis in Section 6.1, combining the results from the 6 projects, the 13 interviews, the organisation- and project documents and the official PM methodology theories as discussed in Chapter 4. The findings from the cross case analysis need to be evaluated for the validity of this scientific research; this was done by consultation with PM professionals in an expert panel as described in Section 6.2. The feedback from this expert panel is used to formulate the final analysis results in Section 6.3. This chapter aims at answering sub question 4:

In what way and to what degree do the fit-for-purpose adjustments contribute to project success?

6.1 Cross case analysis

To be able to perform the cross case analysis on the interview data, multiple steps were taken: First all the interviews were transcribed. Secondly, five colour codes were created to extract the important elements of the transcriptions. These colour code categories were: PM methodology, adjustments relation X (theory to waterboard), adjustments relation Y (waterboard to project), the effect of the adjustments and project success related aspects. Third, the coloured sections were copied and the pages were cut into strips. Fourth, these colour code strips were grouped into piles and reorganised per colour. Fifth, the reorganised strips were pasted onto blank paper, in sequence of the cases. Sixth, the reorganised sections were translated to English in a new document, grouped per project and per colour. The final step of this cross case analysis of the transcripts was to put all the data in a matrix. To create a clear overview, this was done by printing out the case codes (columns) and colour codes (rows) and pasting it onto a big white wall. The data that was grouped per project and per colour was printed on a paper per ‘cell’ of this matrix and also pasted onto the wall. Keywords were marked with the same coloured markers to make them jump out even more. Fout! Verwijzingsbron niet gevonden, shows a photo of the end result, which was studied in multiple sessions to make sure all the cross case information and clues would be noticed.

For the cross case analysis the different aspects were compared and analysed on different levels: partially on the level of the three waterboards (for categories PM methodology, adjustments X and project success), partially on the level of the six projects (for categories adjustments Y and the effect of the adjustments). The findings of the cross case analysis are grouped into three aspects of the main research question, the same division as the sections of the literature study: PM methodologies (sub section 4.1), adjustments to the PM methodology (sub section 4.2) and project success (sub section 4.3).

6.1.1 PM methodologies

The PM methodologies used by the 3 waterboards - and therefore in the 6 different projects - are summarized in Table 9. Note that project WB3A is from waterboard 3 that did not incorporate the IPM model in their in-house methodology, but that project WB3A is a HWBP project and therefore did apply the IPM model.
Table 9: PM methodology per waterboard and project.

<table>
<thead>
<tr>
<th></th>
<th>Waterboard 1</th>
<th>Waterboard 2</th>
<th>Waterboard 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMC</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PRINCE2</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Own methodology</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>IPM</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

To map the adjustments that were mentioned directly and indirectly by all interviewees, a clear definition of the term ‘adjustments’ is needed: Adjustments in this research are deviations from the methodology that the waterboard uses (their organisation-specific methodology), every act that does not follow what is literally written down in the methodology. This can be an addition as well, anything that is not specified by the waterboards’ methodology but simplified, completed, added, skipped, left out, reduced...etc. This definition was however not presented to the interviewees, but formulated afterwards due to the fact that the differences were unfortunately only noted after completing all interviews.

Furthermore, there is a difference in organisation-specific adjustments and project-specific adjustments, as already shown in Figure 10 on page 36 and represented by relationships X and Y.

6.1.2 Organisation-specific adjustments (relation X)

Waterboard 1

When studying the guideline document of WB1 in comparison to the official PMC theory ‘Projectmatig creëren 2.0’ by Bos and Harting (2006), some deviations were discovered:

- The guideline does not contain any textual elaborations, while the book of the official theory is very elaborate on descriptions and not so much on flowcharts. The main idea of the theory as clearly described by Moussault et al. (2011, p. 96) is the lemniscate of ‘us-they-I-it’ with the four creation powers as described in sub section 4.1.3. The employees of WB1 have received a course in PMC thereby the theory should be known to all, but for interim or new employees this elaboration might be missing.

- The six different phases of a project as described in the book of Bos and Harting (2006, p. 97) are: initiation – definition – design – preparation – realisation – aftercare. In the guideline of WB1, the eight phases are: initiation – definition – procurement – specification of requirements – design/preparation – tender – execution – aftercare. This is not consistent, as the PMC methodology does not describe the procurement and tender phases that are needed and incorporated in the organisation-specific guideline of WB1. This is clearly an adjustment to the official methodology to make it more fit for the purpose of this public client organisation.

The control aspects mentioned by the official PMC theory are budget, organisation, time, information, quality and communication (the well-known GOTIK aspects plus communication). These aspects are not visible in the main guideline of WB1, but are incorporated in the format for the project contract, where the project manager and her team explain how that works for each specific project. This project contract is the ‘project plan’ that people often refer to when talking about projects, but the term project contract was adopted to stay close to the PMC terminology.

Waterboard 2

When studying the guideline document of WB2 in comparison to the official PRINCE2 theory, some deviations were discovered:

- The project control aspects that are named by WB2 are: budget, organisation, quality, information, time and risks. The project control aspects that PRINCE2 uses the same budget,
quality, time and risks, but leaves out organisation and information and includes scope and benefit.

- According to the PRINCE2 theory, “the project board is ultimately responsible for the project” (Hedeman et al., 2009, p. 38). At WB2 the ultimate responsibility lies with the director, thereby the project board loses part of their deciding power as it is intended in the PRINCE2 theory. This was noted by interviewees WB2B-PM and WB2B-IC as annoying and hindering in the daily processes.
- An addition of WB2 in the instructions is the page where the principle ‘tailoring the methodology to the project’ is explained by providing three categories for a project: large, medium and small. The definitions of these categories are described, for the large and medium projects all elements in the document are mandatory, for small projects there is a separate guideline on which steps and documents to skip.
- The interviewees from WB2 also pointed out that the programme manager can intervene in the project team regarding the placement of team members based on competences. According to the official PRINCE2 methodology the project manager is in charge of her team and should make those kinds of decisions.

Another addition (although not found in the instructions document) is that because the contract type UAV-GC and PRINCE2 and IPM are combined at waterboard 2, an extra paragraph was needed to explain the relations and responsibilities, especially regarding the mandate of the contract manager. Roles like the contract managers’ are the five disciplines of IPM, these are the ‘team managers’ from the PRINCE2 theory.

**Waterboard 3**

For the study of adjustments between official theory and organisation specific guideline, there is not one official methodology the guideline of WB3 can be compared to (like PMC and PRINCE2 for the other two waterboards). Therefore this guideline is compared with the ISO 21500 standard, the Dutch norm for ‘Guidance on project management’ (ISO21500, 2012). This ISO standard provides an overall guideline for project management, regardless of the type of organisation or type of project; therefore it is deemed to be applicable in this analysis.

The guideline of WB3 is called ‘Guideline project management WB3’ (WB3, 2012), and is a document of 34 pages. The ISO 21500 standard is described on such an abstract level that any guideline for a waterboard would most likely fit into this general description of how projects should be managed. The guideline of WB3 does neatly describe most needed elements:

1. A general chapter about projects and project management;
2. The description on how the six phases are organised: initiation – definition – design – preparation – realisation – handover & evaluation;
3. The project control measures of GOTIK are used: budget – organisation – time – information – quality. An additional paragraph elaborates shortly on risk management;
4. The project organisation and its embedding in the entire organisation are discussed;
5. One final page describes the project files.

These elements are also included in the ISO 21500 standard, which describes (the definition of) a project, the project environment, project governance, project life cycle (however not specific phases) and project processes. Especially in these processes, the ISO 21500 is quite elaborate, naming 40 processes that include anything from the development of project plans to the identification of stakeholders and collection of lessons learned. The guideline of WB3 is limited in these processes, resulting in the lack of risk management and evaluation according to WB3B-PM and no updates of the guideline in terms of lessons learned or best practices actively being incorporated since 2012. Therefore it can be stated that the guideline of WB3 covers all major elements of how project management should be (described), but lacks more detailed descriptions of aspects that are needed in the day-to-day business of project managers.
Other cross-organisational findings include:

- All waterboards work with best practices, WB1 and WB2 continuously add lessons learned to the organisation-specific methodology, while WB3 based their entire methodology on best practices but have not updated it since then (2010/2011). This means that apart from the official methodologies of PMC and PRINCE2, adjustments are made that suit the organisation.

- Waterboard 1 and 2 use the IPM model, and based on the five roles in that model they have separate knowledge networks for each of the five disciplines. These networks come together in separate knowledge meetings around 4-7 times a year. In these meetings they discuss different matters, including the guideline, forms and documents that follow from that guideline and are applicable to their discipline. The quality manager of WB1 and the CBT\(^9\) of WB2 get their feedback for the guideline from these meetings and incorporate that in the next update.

- At WB1, some small projects are performed by one project leader, who reports to the project manager of a full IPM team. This way very small projects are clustered under an IPM team, while not all five team members have to interfere with that project.

- Regarding the best practices and lessons learned that are incorporated into the guidelines, it takes years to develop an organisation-specific framework.

- The PRINCE2 theory has 7 main principles, from which one is “tailoring the methodology to the project” (Hedeman et al., 2009, p. 19). This means that for each project the project manager needs to look at what she needs and how she is going to organise the project. Due to this principle, the interviewees from waterboard 2 were all very explicit when stating that they do not make any adjustments to the PM methodology since the methodology incorporates and encourages the fit-for-purpose tailoring.

6.1.3 Project-specific adjustments (relation Y)

The adjustments between the organisation-specific methodology and the individual projects were already listed in three tables in Section 5.4 of the case results. This sub section combines these adjustments in Table 10, and elaborates on the occurrence of these adjustments based on methodology (Table 11 on page 46) and type of project (Table 12 on page 46).

<table>
<thead>
<tr>
<th>The adjustment</th>
<th>(in)direct</th>
<th>Reasons mentioned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 <strong>WB1A</strong></td>
<td>Next to the financial mandate, the time mandate was defined for this project.</td>
<td>Direct</td>
</tr>
<tr>
<td>2</td>
<td>The report of the execution phase is still in draft, because nobody asks for it.</td>
<td>Direct</td>
</tr>
<tr>
<td>3</td>
<td>Not waiting for the results of research, taking a small risk.</td>
<td>Direct</td>
</tr>
<tr>
<td>4</td>
<td>The milestone ‘start of execution’ was rephrased in order to meet the deadline.</td>
<td>Indirect</td>
</tr>
<tr>
<td>5 <strong>WB1B</strong></td>
<td>Shared risk register with the contractor.</td>
<td>Direct</td>
</tr>
<tr>
<td>6</td>
<td>Additional financial mandate when the project went over budget (€100.000,- extra available from the €500.000,- risk budget).</td>
<td>Direct</td>
</tr>
<tr>
<td>7</td>
<td>The IPM role of the stakeholder manager was distributed among the project team.</td>
<td>Direct</td>
</tr>
<tr>
<td>8</td>
<td>The contract manager did the planning</td>
<td>Direct</td>
</tr>
</tbody>
</table>

\(^9\)‘Centraal Beheers Team’, responsible for the management of the organisation-specific methodology at WB2.
This project had a shared risk register with the contractor

General adjustment: First look what you need from the methodology and guideline, only use that.

General adjustment: Skipping, combining or stretching phases if necessary.

IPM roles were used for the first time.

Additional financial mandate for small things (€0, - to €10.000,-)

The entire organisation structure of this project was different than usual, since this was a HWBP project in combination with the municipality and harbour club. They had their influence on the methodology as well, therefore the guideline of the waterboard was almost not influential.

Skipping a phase, combining the documentation.

The budget plan and design statement were merged into one document, skipping the design phase.

Table 10: All the project-specific adjustments.

Apart from these direct and indirect adjustments the project managers made to these 6 cases, there were some adjustments mentioned that were used for other projects or adjustments that would be possible (but have not happened in these specific cases):

For all three waterboards is was indicated that the project manager is the one to make a project-specific methodology, choosing from the “toolbox” which tools she thinks are needed and fit the project. Hereby the interviewees refer to the elaborate guidelines from which they pick and choose the elements they need when setting up a project. This is in line with the research of Klein et al. (2015), who clearly stated that customization has a basis in existing theory, and involves selecting what you need. This picking and choosing includes e.g. leaving out the PSU at WB1, where the quality manager indicated that projects like dredging activities are so similar that the team already knows what to do and does not need such a session. When phases overlap at WB2, it would also be possible not to make multiple overlapping phase plans but one year plan instead. Another possibility mentioned at WB3 is to skip entire phases if that is necessary to save time. Time is also being saved when the project manager decides not to write a progress report because nobody reads that anyway (happened so often that the progress report is not mandatory anymore). For smaller projects at WB3 (up to €1 million) there is not always an entire project plan, since skipping this saves time as well. Phases, or documents being skipped was reported often at WB3, since the workload for the employees of the engineering department is indicated to be very high.

At WB2 on the other hand it is also possible to add extra products, like an expert judgement or a challenge.

From the 16 adjustments in Table 10, it can be concluded that adjustments to the PM methodologies are necessary in the practice of project managers, but that there is a difference in the organisations’ methodology how often this is needed (see Table 11). It seems as if based on this data more adjustments are needed to PMC than to PRINCE2, with totals of 8 and respectively 3 adjustments over the cases. The
own developed methodology of WB3 falls in between. However, no hard conclusions should be derived from these numbers, since it is not a quantitative study with statistically significant outcomes; this is merely an indication of the found adjustments.

<table>
<thead>
<tr>
<th>Projects</th>
<th>Direct</th>
<th>Indirect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMC + IPM</td>
<td>2</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>PRINCE2 + IPM</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Own methodology</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 11: Direct and indirect adjustments per methodology.

Another distinction can be made based on the project being a HWBP project or a regular project (see Table 12). This table shows that at the HWBP projects the same amount of adjustments were made to the PM methodology as with regular projects (8 versus 8). However the difference lies in the direct and indirect adjustments. It can be stated that the project managers of the HWBP projects apply almost the same amount of adjustments indirectly as directly (5-3), while the project managers of the regular projects recognise and name their adjustments more often resulting in a sevenfold score compared to the indirect adjustments.

This could perhaps indicate that the project managers of the regular projects are more familiar with the methodology they work with and recognise the need for adjustments more than the project managers of the HWBP projects, but this is not proven by this data.

<table>
<thead>
<tr>
<th>Projects</th>
<th>Direct</th>
<th>Indirect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>HWBP</td>
<td>3</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Regular</td>
<td>2</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 12: Direct and indirect adjustments per type of project (HWBP/regular).

### 6.1.4 Underlying reasons for adjustments

For the direct adjustments to the PM methodologies reasons were provided by the interviewees; for the indirect adjustments this is of course not the case and reasons can only be assumed.

In Table 13 the main reasons behind the adjustments are listed in the left column, with their total occurrence in the right column. As mentioned in Chapter 4, adjustments usually come in two forms: as a completion of what the PM methodology prescribes, or as a simplification of all that is written. The reasons for the adjustments are put in these categories to perhaps gain extra insights.

Time is by far the most prominent reason why adjustments are made (7 out of 12). This includes adjustments like shortening phases or overall project duration and additional financial mandate to be able to act quickly. Efficiency, the second most prominent adjustment reason, is closely related to time, but also incorporates budget. This is e.g. leaving out an IPM role, which makes communication faster but also avoids an extra person who needs to be paid. The risk management reason for one direct adjustment included a shared risk register with the contractor, without this some risks affecting the planning would have been overlooked and the shared understanding and good collaboration would not have been the same. A shared risk register was not mandatory nor customary and is therefore a completion; one that this project manager will apply in other future projects as well. The knowledge development was a try-out of the IPM model at WB3, mandatory from the HWBP procedures but also a nice chance to work with the model and maybe implement it in future projects as well.

<table>
<thead>
<tr>
<th>Reason for adjustment</th>
<th>Completion</th>
<th>Simplification</th>
<th>Total occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Efficiency</td>
<td>-</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Risk management</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Knowledge development</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 13: Reasons for the direct adjustments.
From this overview in Table 13 it can clearly be stated that the main reason why project managers make adjustments to PM methodologies is time and time related efficiency.

For the indirect adjustments the actual reasons were not literally mentioned by the interviewees, although this can easily be filled in when looking at the descriptions of the adjustments (see Table 14). Time again is the most prominent reason, and all three time related indirect adjustments can be classified as simplifications. The shared risk register occurred once more, this time in a different case. Facilitating collaboration was necessary to work together with three organisations when realising project WB3A.

<table>
<thead>
<tr>
<th>Reason for adjustment</th>
<th>Completion</th>
<th>Simplification</th>
<th>Total occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Risk management</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Facilitating collaboration</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 14: Reasons for the indirect adjustments.

6.1.5 Project success

Project success has been elaborately described in Section 4.3 on page 25. Throughout history, different definitions of project success have been used, slightly changing the previous definitions and adding more and different success criteria. The literature study concluded on the use of the following 6 success criteria based on the research of Bakker et al. (2010): No accidents, happy client, budget, quality, schedule and start up (descriptions of these criteria can be found in Table 5 on page 28).

From the 6 project success criteria that Bakker et al. (2010) concluded on, only a few came forward in this research. ‘Time’ is the reason for 9 out of 16 adjustments, although it has to be mentioned that time in most of these cases cannot be fully separated from money. Project governance is based on public financing, and the focus on time is often indirectly a focus on budget. For example project WB1B was very strongly time driven, since the deadline of being finished with the work on the 1st of September was very strict. However, the reason this deadline was so strict was due to the financial implications that time overruns would entail, hundreds of thousands of euro’s would need to be spent per week to pay for temporary water pumps if the renovation of the water pumping station would not be finished in time.

Safety is said to be important, but none of the project managers at the waterboards mentioned it as their top priority, more as an implicit aspect that is on the agendas of some meetings.

Project success seems to be quite traditional at these waterboards, mostly related to time and budget. Although none of the organisations from this research had written down organisation-specific success criteria, when asking about other success related aspects, the image or reputation of the waterboard was mentioned as very important. This most likely has a connection to the waterboards being a public client organisation, working with public money and a democratically chosen board.

For the direct adjustments the interviewees indicated how much influence each adjustment had on project success, this can be seen in Table 15. In total, 9 out of the 12 direct adjustments had a (large) contribution to project success, indicating the importance of adjustments. This should be interpreted as a majority, not as an exact number or percentage. However, this does not mean that without the adjustments the projects would not have been a success, there are more factors that influence the overall project success as Munns and Bjeirmi (1996) stated.
6.2 Evaluation by expert panel

The findings from the case studies and the cross case analysis are of course specific for the cases that were chosen. For scientific research it is important to validate whether these findings are recognizable and representative for adjustments to PM methodologies on a larger scale. This means that the convergence that was established from the start towards the case studies (Chapter 1 towards the results of the case studies in Chapter 5) needs to be diverged to conclusions that are valid not only for these 6 specific cases, but also in a broader perspective for other infrastructure projects for public clients in the Netherlands.

The selection of the experts determines the quality of the panel, and thereby also the validity of the generalised conclusions. Therefore, before selecting the professionals a set of criteria was established to guard this quality:

1. The expert panel should preferably exist of 5-10 professionals active in the field of project management; less than 5 could be considered as too little, while the additional insights of more than 10 professionals could become marginal.

2. The experts should have experience with the PM methodologies encountered in this research: PMC, PRINCE2 and the collaboration model IPM, per methodology at least two persons.

3. The experts should have significant years of relevant work experience, defined by the author as at least 10 years in project management, preferably as a project manager.

4. The expert panel should be a combination of professionals from public, semi-public and private organisations. This contributes to the generalizability of the research conclusions to a broader range of organisations than only waterboards.

5. Some of the experts should be from waterboards, preferably with experience on HWBP projects. These waterboards are not allowed to be the same organisations as waterboards 1, 2 and 3 of the case studies in this research. Best would be if these experts from waterboards would be from different areas in the Netherlands, not closely related to the areas of the cases.

With this set of criteria, an expert panel was formed with 7 professionals working in project management of different infrastructure projects at different kind of organisations. Their background information can be found in Table 16:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Meaning of the scale</th>
<th>Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No contribution to project success</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Little contribution to project success</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Neutral</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>There is a contribution to project success</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>There is a big contribution to project success</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 15: Scale 1-5 on contribution to project success.
The first selection criterion was met, in total 7 experts were interviewed. The second selection criterion was also met: 3 experts had experience with PCM, 3 experts had experience with PRINCE2 and 4 experts had experience with IPM. All of the experts have significant years of relevant work experience, 2 experts have worked for 10 years in the sector, while the rest has over 20 years of experience and even up to 40 years. In Table 16 the organisations where these experts work are listed in the second column. Here it is shown that 3 experts work at waterboards and 1 at Rijkswaterstaat, therefore 4 out of 7 experts work at public organisations. Schiphol Group is considered to be a semi-public organisation, while the last 2 are private organisations. This provides a nice spread of organisational backgrounds, satisfying the fourth and fifth selection criteria.

Apart from the selection criteria, the opinions of the experts are considered valuable and important for the following reasons: Expert EP-1 is considered to be the main IPM specialist of Rijkswaterstaat, having worked his entire professional life in project management and is one of the founders of the IPM model (this fall his book about the IPM model will be published). Experts EP-2, EP-3 and EP-7 work at waterboards and therefore familiar with the type of projects a waterboard performs, and on top of that they are all working on HWBP projects in different parts of the Netherlands. Expert EP-4 is involved in all different aspects of project management as consultant, trainer, manager, coach and author, has worked with many methodologies and has written a book comparing 10 different project management methodologies; she is experienced with the theory as well as with the practice of project management. Expert EP-5 works at the Schiphol Group and is in charge of a €2 billion construction project, this together with his 30 years of previous work experience with project management makes him very qualified to be part of this expert panel. Expert EP-6 has 38 years of experience with project management and has written the official theory book of PRINCE2 and is now partner at his own consultancy firm.

The above provided descriptions elaborated on why the opinions of the experts in this panel should be highly valued regarding the evaluation of this research. The transcripts of the expert panel interviews are digitally available upon request.

These 7 experts were presented with a 3,5 page summary on the findings from this research concerning PM methodologies, their adjustments in practice and relation to project success. A short context was provided per email as well as an oral description at the start of each interview. For practical reasons the interviews were conducted per individual, not in one large group. Therefore no ideas or comments were
exchanged between the professionals, but more personal time (30-60min) was available to discuss their interpretations and suggestions.

The outcome of these validation sessions is summarized in Table 17. Overall the experts recognized the type of adjustments made (displayed in Table 10 on page 45), and named it logical and practical, having experienced similar adjustments in their own work. The number of adjustments however was more a subject of discussion, as some experts recognized it (2/7), some did not dare to draw any conclusions (2/7) while others would have expected more adjustments (2/7). These numbers should not be interpreted too strictly, it just shows that the experts were divided on this aspect. The overall majority of experts recognised the underlying reasons for the adjustments, that it is mostly time driven, followed by efficiency. The modern definition of project success entails more than just the iron triangle (this was emphasized by the experts), yet the interviewed project managers indicated that time and budget were the main criteria for their projects to become a success. This focus on time and budget was recognized by most of the experts, although the footnote was added that there is way more to project success than these adjustments to the methodology, that drawing conclusions should be done with extreme care.

| EP-1  | Type of adjustments are recognizable, logical. Number not mentioned. | Time and efficiency is recognizable, but only control aspects. | 9/12 recognizable. |
| EP-2  | Type and number recognizable. | Recognizable, but no mention of money/budget. | Recognizable, if PM methodology focusses on the hard aspects, the adjustments will be on hard aspects too. |
| EP-3  | You can’t call it adjustments, I would suggest naming it deviations... | Difficult to say anything about this.. | Recognizable that project success is strongly related to time and budget. |
| EP-4  | Number not recognizable (expected way more), type is recognizable. | Logical and recognizable. | Really recognizable. |
| EP-5  | Nothing possible to say about numbers, type is recognizable. | Recognizable, but is it the right methodology in the first place? | Expected the opposite (of the contributions in Table 15 on page 48). |
| EP-6  | Recognizable things, more adjustments expected if research goes deeper. | Logical, time is the biggest problem. | Time and budget recognizable. |
| EP-7  | Type and number recognizable. | Recognizable. | Surprising, no (project/organisation-specific) success criteria, yet contribution. |

Table 17: Summarized outcome of the expert panel evaluation sessions.

6.3 Final analysis results

After the consultation with the PM professionals from the above mentioned expert panel, some aspects of the findings needed to be reconsidered. These reconsiderations will be discussed in this section, coming to the final analysis results that will further be discussed in Chapter 7 and used to formulate the conclusions and recommendations in Chapter 8.
Although overall the experts recognized the type of adjustments that were presented to them from their own work experience, there was one comment that was often made: ‘is it a real adjustment to the PM methodology?’. This comment triggered a second look into the nature of all adjustments, resulting in the following distinction:

Until this point in the report, adjustments to PM methodologies were all treated the same (sub section 1.4.1 even defined adjustments, adaptations, deviations, alterations and modifications to mean the same thing). The cross case analysis shed more light on the adjustments that resulted from the case studies. Distinctions were made between organisation-specific adjustments and project-specific adjustments, and these occurred in the interviews directly or indirectly.

Yet another distinction should be made, based on the total list of adjustments and the comments from the expert panel: adjustments are split into deviations and additions (see Figure 11).

Deviations are defined as an adjustment where the project manager choose to do something differently than the organisation-specific methodology prescribed. This is a situation where the methodology specifies in the guideline how something should be done, but the project manager choses to deviate from that by doing it differently.

Additions are defined as adjustments where the organisation-specific methodology in the guideline did not prescribe if something should be done, or in case it is prescribed the description on how to do this is missing. In these situations the project manager did not deviate from the guideline, but completed the guideline and methodology by adding a fit-for-purpose adjustment of her own.

Each adjustment as previously listed in Table 10 on page 45 is now re-examined and labelled as deviation or as addition in Table 18. Elaborations on why these adjustments are labelled as they are will be provided per adjustment after Table 18.

<table>
<thead>
<tr>
<th>The adjustment</th>
<th>Deviation</th>
<th>Addition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Next to the financial mandate, the time mandate was defined for this project.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2  The report of the execution phase is still in draft, because nobody asks for it.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3  Not waiting for the results of research, taking a small risk.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4  The milestone ‘start of execution’ was rephrased in order to meet the deadline.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>5  Shared risk register with the contractor.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6  Additional financial mandate when the project went over budget (€100.000,- extra available from the €500.000,- risk budget).</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>7  The IPM role of the stakeholder manager was distributed among the project team.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>8  The contract manager did the planning</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>9  This project had a shared risk register with the contractor</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>10 General adjustment: First look what you need from the methodology and guideline, only use that.</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Figure 11: Adjustments, split in deviations and additions.
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>General adjustment: Skipping, combining or stretching phases if necessary.</td>
<td>X</td>
</tr>
<tr>
<td>12</td>
<td>IPM roles were used for the first time.</td>
<td>X</td>
</tr>
<tr>
<td>13</td>
<td>Additional financial mandate for small things (€0,- to €10.000,-)</td>
<td>X</td>
</tr>
<tr>
<td>14</td>
<td>The entire organisation structure of this project was different than usual, since this was a HWBP project in combination with the municipality and harbour club. They had their influence on the methodology as well, therefore the guideline of the waterboard was almost not influential.</td>
<td>X</td>
</tr>
<tr>
<td>15</td>
<td>Skipping a phase, combining the documentation.</td>
<td>X</td>
</tr>
<tr>
<td>16</td>
<td>The budget plan and design statement were merged into one document, skipping the design phase.</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 18: Adjustments categorized as deviations and additions.

1. **Next to the financial mandate, the time mandate was defined for this project:**
   This adjustment is an addition to be more precise. Time mandate was not defined for the project manager, for this project he did define this with his internal client, they added the time mandate.

2. **The report of the execution phase is still in draft, because nobody asks for it:**
   The guideline prescribes that at the end of each phase a phase report should be composed. For this project the report of the execution phase was skipped and therefore the project manager deviated from the guideline.

3. **Not waiting for the results of research, taking a small risk:**
   This adjustment is a deviation because the point of research is to wait for the results and act on it; acting before the result of the research is known, is a deviation from how it should be.

4. **The milestone 'start of execution’ was rephrased in order to meet the deadline:**
   This adjustment is a deviation, because the definition of ‘start of execution’ was changed: the project manager decided to formulate it differently thereby deviating from the guideline.

5. **Shared risk register with the contractor:**
   On top of the described risk management and registers, the project manager decided to share the risk register with the contractor, making an addition to the guideline.

6. **Additional financial mandate when the project went over budget (€100.000,- extra available from the €500.000,- risk budget):**
   This is clearly an addition, since financial mandate within the risk budget is not available nor defined. The internal client agreed to grant additional financial mandate to the project manager for only this project.

7. **The IPM role of the stakeholder manager was distributed among the project team:**
   This adjustment is a deviation from how the IPM roles are described and prescribed by the waterboard.

8. **The contract manager did the planning:**
   This adjustment is a deviation from how the IPM roles are described and prescribed by the waterboard.

9. **This project had a shared risk register with the contractor:**
   On top of the described risk management and registers, the project manager decided to share the risk register with the contractor, making an addition to the guideline.

10. **General adjustment: First look what you need from the methodology and guideline, only use that:**
This general adjustment is a deviation from the methodology as described by this waterboard. The project manager chooses to deviate from the total methodology by only using certain elements that fit her project.

11. **General adjustment: Skipping, combining or stretching phases if necessary:**
   This general adjustment is a deviation from the methodology as described by this waterboard. The project manager chooses to deviate from the methodology by combining or stretching certain phases differently than prescribed.

12. **IPM roles were used for the first time:**
   On top of the organisation-specific methodology which does not include IPM roles, this project added these IPM roles; therefore this adjustment is an addition.

13. **Additional financial mandate for small things (€0,- to €10.000,-):**
   This is clearly an addition, since no financial mandate is available to the project manager, but for this project that was added.

14. **The entire organisation structure of this project was different than usual, since this was a HWBP project in combination with the municipality and harbour club. They had their influence on the methodology as well, therefore the guideline of the waterboard was almost not influential:**
   The organisational structure of this project deviated in multiple aspects from how a different project at this waterboard would normally be performed, therefore this adjustment is a deviation.

15. **Skipping a phase, combining the documentation:**
   This adjustment is a deviation from the methodology as described by this waterboard. The project manager chose to deviate from the methodology by combining or stretching certain phases differently than prescribed.

16. **The budget plan and design statement were merged into one document, skipping the design phase:**
   This adjustment is a deviation from the methodology as described by this waterboard. The project manager chose to deviate from the methodology by combining two documents into one and skipping a phase that is prescribed in the guideline of this waterboard.

In Table 18 with the distinctions between deviations and additions it can be seen that 9 adjustments were labelled as deviations, while 7 adjustments were labelled as additions. However, no conclusions can be derived from these numbers, it can only be stated that for this specific data of these 6 cases, the deviations and additions are roughly fifty-fifty.

From the cross case analysis, evaluation by the expert panel and the final analysis results, now sub question 4 can be answered:

> "In what way and to what degree do the fit-for-purpose adjustments contribute to project success?"

The fit-for-purpose project-specific adjustments can be categorized in two ways, as deviations and additions which occur roughly fifty-fifty. These do both contribute to project success, since the majority was indicated to make a (large) positive contribution to project success. Organisation-specific adjustments are present at all waterboards, the theories have been made applicable for the type of projects, e.g. adding a procurement and tender phase. Although project success has an elaborate and modern definition as discussed in Chapter 4, for the project managers time was the most prominent underlying reason to make adjustments or completions. Also time and budget were the two main success criteria that project managers valued and strived for, which confirms the study of Koops et al. (2017). Therefore it is concluded that fit-for-purpose adjustments occur in the form of deviations and additions, which overall both contribute to project success in a positive way, influencing mostly time and budget criteria.
PART FOUR

Discussion
Conclusions & Recommendations


## 7 DISCUSSION

This chapter includes a discussion on the data and results of this research. The aim is to discuss the findings, what the findings mean, how this can be interpreted and be placed in a broader context, what new insights are discovered, what can be learned from this and what limitations there were to this research. This will be elaborated on in the following sections: discussion of the results (Section 7.1), implications of the results (Section 7.2) and limitations of the research (Section 7.3).

### 7.1 Discussion of the results

This research is an exploratory research into the practice of project management. This means that existing literature has not covered this topic yet: the need for adjustments has been investigated, but not what this actually entails on the level of a project. Therefore the investigated area and results are new and their meaning cannot be compared to previous studies or theoretical frameworks. However, the meaning of the results can be discussed, which will be done in four sub sections: adjustments (sub section 7.1.1), underlying reasons (sub section 7.1.2), project success (sub section 7.1.3) and some general remarks (sub section 7.1.4).

#### 7.1.1 Adjustments

The major findings of this research are the adjustments that were used by the project managers, a list of 16 actions that were done differently than usual. These were the direct and indirect adjustments that were mentioned in the interviews by the project managers, and verified in the interviews of the internal clients. The content of these adjustments shed light on what happens in practice; what has happened for these 6 projects. The adjustments that have been found in the investigated cases have been performed in the past. Could these adjustments also happen in the future? And to be more precise: should they happen in the future, or was it just fine for these projects but should it not be repeated in other projects?

For each of the 16 adjustments it is stated whether it was just a one-time adjustment or if it would be a good idea to incorporate this adjustment into the organisation-specific methodology and to therefore use it in future projects as well. Table 19 provides the labels ‘once’ and ‘include’ to indicate what could be done in the future. Elaborations on why these adjustments are labelled as they are is discussed per adjustment after Table 19.

<table>
<thead>
<tr>
<th>The adjustment</th>
<th>Once</th>
<th>Include</th>
</tr>
</thead>
<tbody>
<tr>
<td>WB1A 1</td>
<td>Next to the financial mandate, the time mandate was defined for this project.</td>
<td>X</td>
</tr>
<tr>
<td>WB1A 2</td>
<td>The report of the execution phase is still in draft, because nobody asks for it.</td>
<td>X</td>
</tr>
<tr>
<td>WB1A 3</td>
<td>Not waiting for the results of research, taking a small risk.</td>
<td>X</td>
</tr>
<tr>
<td>WB1A 4</td>
<td>The milestone ‘start of execution’ was rephrased in order to meet the deadline.</td>
<td>X</td>
</tr>
<tr>
<td>WB1B 5</td>
<td>Shared risk register with the contractor.</td>
<td>X</td>
</tr>
<tr>
<td>WB1B 6</td>
<td>Additional financial mandate when the project went over budget ($100,000,- extra available from the €500,000,- risk budget).</td>
<td>X</td>
</tr>
</tbody>
</table>
7. The IPM role of the stakeholder manager was distributed among the project team.

8. The contract manager did the planning

9. This project had a shared risk register with the contractor

10. General adjustment: First look what you need from the methodology and guideline, only use that.

11. General adjustment: Skipping, combining or stretching phases if necessary.

12. IPM roles were used for the first time.

13. Additional financial mandate for small things (€0,- to €10.000,-)

14. The entire organisation structure of this project was different than usual, since this was a HWBP project in combination with the municipality and harbour club. They had their influence on the methodology as well, therefore the guideline of the waterboard was almost not influential.

15. Skipping a phase, combining the documentation.

16. The budget plan and design statement were merged into one document, skipping the design phase.

Table 19: Adjustments ‘once’ or to ‘include’ in the organisation-specific methodology.

1. Next to the financial mandate, the time mandate was defined for this project:
   The fact that the project manager needed to define this in consultation with his internal client means that from the guideline it is not automatically clear what the ‘rules’ are concerning time mandate. This should be included in the organisation-specific methodology in order for future project managers to better know what their mandate is. This could be set to zero time delay or e.g. to zero for small projects and up to one month for large or complex projects like this project.

2. The report of the execution phase is still in draft, because nobody asks for it:
   This is an adjustment that was fit for the purpose of this project, the report of the execution phase was not missed and it did save time for the project team. However, this does definitely not mean that such a report should always be left out. Therefore this adjustment was fine for once, but it is not recommended to structurally change this in the organisation-specific methodology.

3. Not waiting for the results of research, taking a small risk:
   This adjustment was fit for the purpose of this project, the result of the research was expected to be positive with only a very small chance of a different result. The risk was small, but nevertheless it an extra risk that should not be automatically included in other projects too. Such a choice has to be made carefully for each situation, the methodology (waiting for results) should remain unchanged.

4. The milestone ‘start of execution’ was rephrased in order to meet the deadline:
   A clear definition of the start of each phase should be included in the guideline, in to prevent any ambiguities. The specific definition that was used for this project (new definition: tender awarded to the contractor) does not have to be set as a new standard, but a clear and unchangeable definition should be included.

5. Shared risk register with the contractor:
Sharing the risk register with the contractor was indicated by the project managers to have a huge positive impact on meeting the strict deadline that was in place for this project. They both indicated that their experience with sharing the risk register with the contractor resulted in more mutual trust, understanding and the mitigation of some important risks. Understandably it is not always possible nor desirable to be fully transparent towards a contractor who is a business relation and has its own interests, but a shared risk register (e.g. up to 75% transparency excluding internal financial or political risks) could be very beneficial for the project and should therefore be included in the organisation-specific methodology.

6. **Additional financial mandate when the project went over budget (€100.000,- extra available from the €500.000,- risk budget):**
   For this project it was beneficial to provide additional financial mandate within the risk budget, but this does not have to be the same of all future projects. Therefore this adjustment was used once and should not be included in the organisation-specific methodology.

7. **The IPM role of the stakeholder manager was distributed among the project team:**
   For this project this adjustment was practical and fit-for-purpose since there was ‘not much environment’ and the team could easily perform the tasks of the stakeholder manager. However the IPM roles are divided into 5 roles for 5 specific areas of expertise, and this should not be suddenly changed for all projects, other or larger projects with ‘more environment’ would miss this role. Therefore this adjustment should not be blindly copied into the organisation-specific methodology, although project managers could take it under advisement as a possible adjustment for small projects.

8. **The contract manager did the planning:**
   For this adjustment the same argumentation holds as for adjustment 7, this was also fit for the purpose of this project but should not be changes in the tasks of the IPM roles as described by the organisation-specific methodology. Therefore this adjustment is advised to remain used once, although personal competences and interfaces between IPM roles and certain tasks could be take into account under advisement when performing certain tasks within the IPM team.

9. **This project had a shared risk register with the contractor:**
   For this adjustment the same argumentation holds as for adjustment 5, which was also a shared risk register but for a different project (WB1B, while this adjustment occurred at project WB2A). It is recommended to include the shared risk register in the organisation-specific methodology.

10. **General adjustment: First look what you need from the methodology and guideline, only use that:**
    This is an adjustment that would be good to include in the guideline of this waterboard. The organisation-specific methodology can be an overload for some projects. At this waterboard there already is a one page leaflet on the mandatory products and phases for small projects, this could be supplemented by a more elaborate description on which elements to include or exclude for certain types of projects or degrees of complexity.

11. **General adjustment: Skipping, combining or stretching phases if necessary:**
    For this adjustment the same argumentation holds as for adjustment 10, a textual elaboration on the possibilities for skipping and combining phases could be included in the guideline.

12. **IPM roles were used for the first time:**
    This project was the first project of waterboard 3 to include IPM roles in the project organisation. The project manager indicated that this ‘experiment’ was successful, the team was satisfied with the 5 IPM roles and the new working dynamics. He is likely to use the IPM roles in future projects as well, and will recommend it to the board when later this year the organisation-specific methodology and guideline will be updated or revised. Because of the positive experience of the project manager and the fact that IPM is proven to work at other waterboards and public organisations as well, this adjustment should be included in the organisation-specific methodology of this waterboard.

13. **Additional financial mandate for small things (€0,- to €10.000,-):**
As indicated in sub section 5.4.3, the project manager of waterboard 3 has no financial mandate at all. From all 4 interviews with the project managers and the internal clients of this waterboard that was indicated to be a hinderance for the projects (for each small deviation on the original project budget the project managers needs to get permission from his internal client). For this project the financial mandate was set to €10.000, which is already better than nothing, but is still very little relative to the €35-40 million project this project manager was working on. Although the height of this new financial mandate should be further investigated, it would be beneficial for projects to include it in the organisation-specific methodology.

14. The entire organisation structure of this project was different than usual, since this was a HWBP project in combination with the municipality and harbour club. They had their influence on the methodology as well, therefore the guideline of the waterboard was almost not influential: This adjustment was very specific for this project, for other or regular projects changing the project organisation could be done, but should not become the new standard in the organisation-specific methodology.

15. Skipping a phase, combining the documentation:
For this adjustment the same argumentation holds as for adjustment 10 and 11. An textual elaboration on which phases to combine or skip in case of methodology overload could be added, but skipping phases should not be included in the organisation-specific methodology, and remains ‘once’ for this project.

16. The budget plan and design statement were merged into one document, skipping the design phase:
For this adjustment the same argumentation holds as for adjustment 15, combining phases should not become the new standard and was fine as a ‘once’ fit-for-purpose adjustment.

In the final analysis results in Section 6.3 all adjustments have been labelled either ‘deviation’ or ‘addition’. This can be combined with the labels ‘once’ and ‘include’ as described in this section, and the overview can be found in Table 20.

<table>
<thead>
<tr>
<th>Adjustment</th>
<th>Deviation</th>
<th>‘Once’</th>
<th>Addition</th>
<th>‘Include’</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>16</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 20: Combinations of adjustment categories.

When combining this data, it was noticed that ‘deviations’ and ‘once’ occur together often, as well as ‘addition’ and ‘include’, therefore these “couples” are highlighted in different colours. The exact numbers (7/16 for the deviation-once combination and 6/16 for the addition-include combination)
should not be used to formulate any conclusions. However, it can be stated that for this data a vast majority (13/16) occurred in these two “couples”.

An explanation could be that additions are per definition adjustments where something in the organisation-specific methodology was missing; it needed to be added. Therefore it would be logical that if these adjustments contribute to the success of a project that it could be a good idea to add it to the methodology so that other projects in the future can also benefit from it. An example here would be the shared risk register (adjustment number 5, from project WB1B) that was experienced as very helpful for both the awareness and mitigations of risks and the collaboration with the contractor.

Deviations were often adjustments where project phases or documentation were skipped, or tasks related to the roles within a project team were shuffled. These kind of adjustments were fit for the purpose of this specific project (making it workable for a smaller project like WB3B e.g.), but that does not mean that the organisation-specific methodology should be changed. Changing this could be beneficial for smaller projects, but then larger projects could miss certain aspects again and it would need to be changed back; this would become an unwanted vicious circle. However, this remains purely hypothetical.

When regarding the number of adjustments that were found (16 adjustments in total, spread over 6 projects) it seems to be a small number. However, there is no similar research from literature to make a solid comparison, nor is there a theoretical framework with definitions of what ‘small amounts’ or what ‘large amounts’ of adjustments would be. Another important side note is that one individual adjustment could have a larger impact on the project than several other adjustments, meaning that a small amount of adjustments can outweigh a large amount of adjustments. Therefore no value judgement can yet be formulated; to measure this a theoretical framework should be designed focussing on measuring the impact of individual adjustments.

A factor that could influence the occurrence of project-specific adjustments is whether or not the organisation has a policy regarding adjustments: is it encouraged to deviate from the organisation-specific methodology or to add elements, or is it strictly prohibited and could project managers even be evaluated negatively if they make adjustments? For the 3 waterboards that were part of the case studies this was not researched, although the author has the strong impression that at waterboard 2 (where they use the PRINCE2 methodology) adjustments are not common. The interviewed project managers kept stating that they do not make adjustments, and that everything they do fits within the “tailoring the methodology to the project”-principle of PRINCE2. This could explain the 3 adjustments for waterboard 2 compared to the 8 adjustments at waterboard 1 e.g. (although still no conclusions should be drawn from these exact numbers).

The organisation-specific adjustments (between theory and waterboards 1 and 2, relation X) were stated in sub section 6.1.2 and the differences with the official theories were pointed out. This was not further discussed in the final analysis results since it did not need any reconsideration after the consultations with the experts. The adjustments were not enormous but nevertheless logical (e.g. adding the procurement and tender phase to the official PMC theory at waterboard 1), it makes the official theory fit for the purpose of the waterboards.

### 7.1.2 Underlying reasons

The underlying reasons for the adjustments were mentioned for the direct adjustments and was mostly time (7/12), combined with the indirect adjustments resulting in a total of 9/16, more than half of all the adjustments. Although no direct statements or knowledge claims should be made based on these numbers, it can be stated that for these 6 cases, the vast majority of adjustments was done for the sake of time.
This could have the following meanings: that infrastructure projects always have tight schedules, that time is the most important parameter at Dutch waterboard projects or that time delays might have secondary implications as well. There is another important possible explanation for the prominent occurrence of time: 5 out of 6 interviewed project managers were not the only project manager of their projects, but the third, fourth of fifth project manager. This means that they were in charge of the final phase of the projects, responsible for the execution and delivery of the project. Therefore most of the project manager who participated in this research have an “execution bias” which could have influenced the results of underlying reasons and project success perception. Expert EP-4 described a situation that often occurs within projects: In the beginning quality is the main focus, at some point the project starts to take too long and near the end usually everything gets too expensive. This combined with the fact that the deadline of delivery is approaching could influence the reasons why project managers make adjustments and also what their views on a successful project delivery are. Since no questions were included in the case study interviews about the scope of their personal work for the project and relations to previous project managers, there can be no certainty about this possible explanation (and therefore it will be included in the limitations of this research in Section 7.3).

Another reason for the occurrence of time as most prominent underlying reason could be because time is almost never fully separable from budget. Project WB1B had a very important time deadline, the 1st of September due to regulation that stated that the water pumping station should be fully available on that date. The implications if this project would not have met this deadline were huge financial costs for installing temporary pumps which would become very expensive very quickly. Another example is the rephrased deadline at project WB1A (adjustment 4), because this project was a HWBP project meeting the deadlines is connected to receiving subsidies. Although this relation between time and money was mentioned by some of the interviewees, it was not researched any further and therefore it is merely part of this discussion but no conclusions should be derived from this.

7.1.3 Project success

The relation between adjustments and project success was investigated in this research, however a few important limitations (listed in Section 7.3) should not be overlooked. The project managers indicated the level to which the adjustments contributed to project success on a scale of 1 to 5 (no contribution to a large contribution), but this was only done for the direct adjustments. The results show that 9/12 direct adjustments contributed (largely) to project success. Again this should not be interpreted as an exact number, more as a majority. The meaning of this majority as expert EP-1 mentioned is “luckily recognizable”, by which he meant that this indicates that if the project managers make adjustments it does eventually help the project, not only because it is convenient at that moment. It proved to be difficult to verify this contribution to project success, therefore it remains an estimation from those 6 individual project managers. The perspectives of these project managers should be understood as well, would they e.g. be likely to state they made a lot of adjustments from which none contributed to the success of a project? The interviews were performed anonymously and everything in the power of the author (interviewer) was done to create a safe atmosphere, but this still remains partially uncertain. The underlying reasons that were named (from which time was the most prominent aspect) are perhaps more important, this tells more about the relation of fit-for-purpose adjustments to project success than the estimated 1 to 5 scale.

7.1.4 General remarks

Another question that could be asked regarding the results of this research is: if the group of cases and interviewees would have been larger, would these results and their meaning have been different? This is of course a hypothetical question because this was not tested nor can it be compared to other larger studies. However, the author estimates this would not be the case. The variation of adjustments was
wide: shared risk registers were named, rephrasing a milestone, combining or leaving out IPM roles, time and financial mandate adjustments and skipping phases. Apart from this wide range, almost all experts recognized the nature of the adjustments from their own work experience. Adding a few more cases could lead to some new project-specific adjustments, but the general outcomes (especially those of the underlying reasons) are not expected to be much different. However, if project managers involved in the earlier stages of the projects would be included in this research (e.g. all 5 instead of only the last one) that might influence the outcomes.

Yet another question could be asked regarding the nature of this research: what would the results be if it would have been a quantitative research? To this the answer is clear, yes it would have made a huge difference. The entire research would be different, as it could not be an exploratory research stating a ‘how’ question as main research question. Trying to discover the fit-for-purpose adjustments and especially the underlying reasons is difficult in a quantitative way, open questions to the project managers would be limited, a set of multiple choice questions could be asked and without knowing what the adjustments are it is impossible to formulate those multiple choice questions. The qualitative research that has been performed could however be followed up in the future by a quantitative study investigating the occurrence of different adjustments at other public, semi-public or private organisations (for future recommendations see Section 8.2).

When taking a step back from this research and looking at the results in a broader perspective, some remarks can be made. Throughout the interviews of the practical orientation, as well as with the project managers and internal clients in the case study phase and even by the experts, it was always said that project management is a practical profession. Project managers like to do things and act on behalf of what is best for their project. They are usually less excited by the rules, guidelines, documentation and will most likely try to work their way around it if possible. The nature of this profession could be a reason that adjustments occur in the first place, and will probably keep occurring in future projects to come. Are adjustments good or bad? That is a question that cannot be simply answered. From the perspective of the project itself and the project manager responsible for it, adjustments to a standard (organisation-specific) PM methodology might be wise; the entire project is a temporary endeavour to achieve a specific goal, if rules need to be bent so be it. However, from the perspective of any organisation where tens or hundreds of projects are performed on a yearly basis, deviating from the agreed PM methodology might be unwanted. What if all projects want to be an exception to the rules? Then it could become a complete chaos at the top of the organisation, this was the main reason why expert EP-5 stated that adjustments in his organisation (∼400 projects per year) are not tolerated at all.

7.2 Implications of the research

This section will explain the implications that this research has as a scientific contribution, as well as a contribution to the practice of project management.

7.2.1 Scientific contribution

This thesis contributes to the scientific community and to scientific knowledge in multiple ways. This research started with a literature study, combining existing knowledge and pointing out interesting areas of research. In the literature study it was discussed that Sauser et al. (2009) argued for organisation-specific methodologies. The 3 waterboards that participated in this research all had their own organisation-specific methodologies, written down in guidelines. To these organisation-specific methodologies Wells (2012) added that project managers will tailor methodologies and that therefore tailoring will occur; this was also confirmed by the findings of this research since each project from the case studies showed adjustments. Payne and Turner (1999) argued that there should be different levels
of adjustments, which was also found in this research when making the distinction between organisation-specific and project-specific adjustments. Fortune et al. (2011) used a quantitative approach to research which methods are used and how often they are used. However, a gap in knowledge became apparent that this research could contribute to. Not one existing literature publication investigated the adjustments themselves on the level of projects in practice. Therefore this research goes one step deeper to this practical level of project-specific adjustments, where adjustments were found, underlying reasons categorized and their contribution to project success touched upon:

This research explores the practice of fit-for-purpose project management by looking closely at what the fit-for-purpose adjustments are that were made for individual projects. This resulted in a (limited) list of adjustments that was evaluated and recognized by the experts from other public, semi-public and private organisations. Underlying reasons for the adjustments were found and categorized indicating why adjustments are made in the first place. The contribution of adjustments to project success was indicated, although this needs further research.

This research contributes concrete fit-for-purpose adjustments with related aspects as underlying reasons and project success that provide insight in the project management of infrastructure in the Netherlands. Recommendations for future research are listed in Section 8.2.1, pointing out interesting areas of research to continue to broaden the scientific knowledge on fit-for-purpose project management.

7.2.2 Practical contribution

This research broadened the current state of knowledge on fit-for-purpose adjustments in project management practice. Insights were created into what these adjustments exactly are, why they occur and what their estimated contribution to project success was. Each adjustment was evaluated whether or not it was fine for just these specific cases, or if it would be recommended to include in the organisation-specific methodologies in order for future projects to benefit from this knowledge.

Project managers working at public organisations performing infrastructure projects now have an indication on which adjustments occur in practice and what reasons might be to deviate from the organisation-specific methodology. Internal clients and policy makers from these organisations may better understand what is needed in the practice at the level of the projects, and might be able to adjust their organisation-specific methodologies to this. Project management or consultancy firms now know what adjustments entail and what elements of PM methodologies they could focus on when advising in favour of or against the use of adjustments within an organisation.

The practical recommendations on how to act on the results of this research can be found in Section 8.2.2.

7.3 Limitations of the research

This research – like any other scientific research – has its limitations that should be highlighted, this means that the results should be used with caution. Recommendations for future research (as will be elaborated on in Section 8.2) are partially based on these limitations.

Practical orientation

- For the interviews of the practical orientation mostly employees of Balance were interviewed. Balance has employees who work on project or interim basis at different organisations, and from the 13 interviews, 10 were conducted with Balance employees. It did not appear that this had a direct and specific result, but there could have been an organisational bias that went unnoticed.
- For this phase not only project managers were interviewed, but people with many different functions (although all working within infrastructure projects). This could have influenced the
level of inside knowledge that the interviewees could share, this was sometimes second-hand knowledge, but did not appear to be a big problem for the outcomes of this phase.

- Interviewee ID-9 had worked previously at Rijkswaterstaat for many years (about which he answered all the questions) and has contributed to the development of the IPM collaboration model; this could have caused a bias that went unnoticed.
- Interviewee ID-11 answered the questions for three different organisations (two municipalities and one waterboard), this means that his views were weighed more than the views of the other interviewees from that phase.

**Case studies**

- In any interview there can be a bias due to poorly formulated questions Yin (2003, p. 86). For this research that would probably be the definition of “adjustments” which was not explained explicitly to the interviewees by providing a definition. Working on this project for months, adjustments were a natural term to the author, but this was not automatically the case for the interviewees.
- Another definition that was not provided to the interviewees was the definition of project success as resulting from the literature study. In some interviews the list of 6 success criteria by Bakker et al. (2010) was mentioned, but it was not part of the standard questions, nor were the interviewees asked to explicitly provide their own definition. Project success criteria were asked, but the definition of the interviewees was most likely not similar, while they did answer the same questions. This could affect the outcomes of the contribution to project success.
- The project managers as well as the internal clients per project were interviewed, to make sure the information provided was not only from one (possibly opportunistic) source. Despite the two sources and confirmation from the interviewees, the occurrence of adjustments was not checked in project reports or change registers. Only the project plans and project contracts were used in this research; apart from availability, studying the entire project documentation of multiple-year projects would not have been feasible within the time scope of this research. This was also done partially because not all changes are documented, and if changes are documented it is mostly a change in contract or additional work with the contractor, not the adjustments to the PM methodologies.
- This research used a qualitative research methodology, not a quantitative approach. This means that although tables have been presented summarizing some findings in numbers, these numbers are not statistically relevant. As stated in the accompanying text, these numbers only indicate if there is a difference between occurrence e.g. being ‘small’ or ‘big’, but no other conclusions can be derived from these tables nor should be attempted to be derived.
- From the 6 interviewed project managers, 5 have not been the only project manager for their project. Often 2 up to 4 previous project managers have worked on that project in earlier phases. Only 1 project manager was the manager for the entire project (WB3B), therefore he was the only one to know the entire history of adjustments of the project. Due to the fact that these 5 project managers were not involved in all previous phases, adjustments to the PM methodology in earlier phases could have been missed.
- From the project managers in the case studies, 5 out of 6 were not the only project manager in their project. This might not only mean that there could be more adjustments that went unnoticed, but also that almost all the project managers that were interviewed are the last project managers in the execution phase of the project. This brings along an ‘execution-bias’, where time and budget could be more important than in previous phases, resulting in a distorted image of the views on project success.
Reliability of the research results

- The measure of how an adjustment contributed to project success was only based on the estimation of the project managers, therefore it is a weak link that might be flawed due to different interpretations or possible exaggerations that were not filtered out.
- Although Koops et al. (2017) came to the same conclusion, the outcome of the two main project success criteria that project managers deemed most important (time and budget) might be specific for the type of organisation. Waterboards are a governmental body, with an elected board and working with public money. Public infrastructure projects are almost always under time pressure as multiple experts emphasized; governments want it cheap and they want it yesterday. This could explain the majority of adjustments having the underlying reasons of time, but could also implicate that this could be different for other (private) organisations that do not have elected boards.
- Although the 6 projects were sufficient to conclude on the nature of adjustments and their underlying reasons, per PM methodology only 2 projects were investigated. This is not sufficient to conclude if one PM methodology needs more adjustments than another since factors like organisation, organisation culture, the choice of projects, the project managers as persons etc also might also contribute to these differences.

Evaluation by expert panel

- Interviewee EP-6 is an author of the official PRINCE2 theory book as discussed in Chapter 4. This means that apart from his other work experience he most likely had a bias towards favouring PRINCE2 over other methodologies when discussing the results of this research.
8 CONCLUSIONS & RECOMMENDATIONS

The final chapter of this thesis contains the conclusions from this research in Section 8.1, where the sub questions throughout this research will shortly be elaborated on, resulting in the answer to the main research question. From this research, its findings and its limitations, recommendations can be formulated. This is done in Section 8.2, with a distinction between future scientific research recommendations and practical recommendations. This thesis ends with an additional personal reflection, which can be found in Section 8.3.

8.1 Conclusions

The objective of this research was to investigate the practice of PM methodologies at Dutch public clients to gain knowledge about fit-for-purpose adjustments that would contribute to more effective project management in the Netherlands. This was done by using a qualitative research methodology, performing case studies and doing interviews and combining it in a cross case analysis to answer the research questions. The sub questions as stated in Section 1.4 will be repeated, and finally the answer to the main research question will be formulated;

How do the fit-for-purpose adjustments to the PM methodologies used by public clients in the Netherlands contribute to project success of infrastructure projects?

This research started with the practical orientation. The aim was to investigate if public clients in the Netherlands use any PM methodologies at all, and if so what these methodologies are for which public clients. This chapter described the general ‘what’ questions regarding the PM methodologies for all public clients in the Netherlands and helped to narrow down the scope of the research for the case studies in the later phase. Sub question 1 was answered:

“What kind of PM methodologies does the public client use?”

Public clients in the Netherlands can be categorized into four levels: the national government, regional governments, waterboards and local governments. The public clients that were the subjects of the interviews differ a lot in size and professionalism regarding project management. A few different methodologies are used, mainly PMC, PMW, PRINCE2 and the collaboration model IPM. Sometimes for small projects one project leader takes care of the project. The exact division of methodologies per public client organisation can be found in Table 21.

<table>
<thead>
<tr>
<th>Public client</th>
<th>PM methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>National government – RWS</td>
<td>IPM + PMW</td>
</tr>
<tr>
<td>Regional government – Provinces</td>
<td>IPM + PMW, “IPM-light”</td>
</tr>
<tr>
<td>Waterboards</td>
<td>IPM + PMW/PMC, small jobs 1 PL</td>
</tr>
<tr>
<td>Local government – Municipalities</td>
<td>Small: nothing, Medium: other, Large: IPM + PMW</td>
</tr>
<tr>
<td>Semi-public government</td>
<td>PRINCE2</td>
</tr>
</tbody>
</table>

Table 21: Summary of PM methodologies at different public clients.

After the practical orientation the literature study was performed. The aim was to gain insight in what knowledge about the topic of this thesis was already available, what kind of research has been
performed in the past and how this thesis would fit into the gap of knowledge. **Sub questions 2** was answered:

"**What is already known about the use of PM methodologies, their adjustments in practice and project success?**"

PM methodologies were created to achieve better project results and are per definition standardized. Multiple PM methodologies exist, developed in the past decades and described in books and by organisations. There are two movements, from which one advocates that adjustments need to be made to make the PM methodology fit-for-purpose to an organisation and to the projects themselves (the other believes in standardization where no adjustments are necessary). However, no studies have been conducted so far into what these adjustments actually are, which leaves open the opportunity for this research. Adjustment are said to contribute to project success, for which different definitions have been used since the 1970’s. This research will use the success criteria formulated in the research of Bakker et al. (2010).

<table>
<thead>
<tr>
<th>WB</th>
<th>Project</th>
<th>Type</th>
<th>Subject</th>
<th>PMC</th>
<th>PRINCE2</th>
<th>Own meth.</th>
<th>IPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>WB1</td>
<td>WB1A</td>
<td>HWBP</td>
<td>Dike reinforcement</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>WB1B</td>
<td>Regular</td>
<td>Renovation: water pumping station</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WB2</td>
<td>WB2A</td>
<td>HWBP</td>
<td>Dike reinforcement</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>WB2B</td>
<td>Regular</td>
<td>Renovation: sluice</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WB3</td>
<td>WB3A</td>
<td>HWBP</td>
<td>Coastline reinforcement</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>WB3B</td>
<td>Regular</td>
<td>Dredging of a waterway</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 22: Overview of projects for the case studies.

For the data gathering of this research 6 case studies were performed, from which an overview is shown above in Table 22. For each project the project manager and the internal client were interviewed, with the aim to find out what adjustments are made to make PM methodologies fit-for-purpose. **Sub question 3** was answered:

"**What adjustments are made to the PM methodology to make it more fit for the purpose of a specific project?**"

There are multiple adjustments of different nature made to the PM methodologies the waterboards use. These can be split into the direct and indirect adjustments: adjustments explicitly named by the interviewees when answering certain interview questions and adjustments that were mentioned when reading the transcripts between the lines. This was mostly (12/16) direct adjustments. The complete list of adjustments can be found in Table 23.
The project-specific adjustment

<table>
<thead>
<tr>
<th>WB1A</th>
<th>1. Next to the financial mandate, the time mandate was defined for this project.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. The report of the execution phase is still in draft, because nobody asks for it.</td>
</tr>
<tr>
<td></td>
<td>3. Not waiting for the results of research, taking a small risk.</td>
</tr>
<tr>
<td></td>
<td>4. The milestone ‘start of execution’ was rephrased in order to meet the deadline.</td>
</tr>
<tr>
<td></td>
<td>5. Shared risk register with the contractor.</td>
</tr>
<tr>
<td></td>
<td>6. Additional financial mandate when the project went over budget (€100.000,- extra available from the €500.000,- risk budget).</td>
</tr>
<tr>
<td></td>
<td>7. The IPM role of the stakeholder manager was distributed among the project team.</td>
</tr>
<tr>
<td></td>
<td>8. The contract manager did the planning</td>
</tr>
<tr>
<td>WB2A</td>
<td>9. This project had a shared risk register with the contractor</td>
</tr>
<tr>
<td>WB2B</td>
<td>10. General adjustment: First look what you need from the methodology and guideline, only use that.</td>
</tr>
<tr>
<td></td>
<td>11. General adjustment: Skipping, combining or stretching phases if necessary.</td>
</tr>
<tr>
<td>WB3A</td>
<td>12. IPM roles were used for the first time.</td>
</tr>
<tr>
<td></td>
<td>13. Additional financial mandate for small things (€0,- to €10.000,-)</td>
</tr>
<tr>
<td></td>
<td>14. The entire organisation structure of this project was different than usual, since this was a HWBP project in combination with the municipality and harbour club. They had their influence on the methodology as well, therefore the guideline of the waterboard was almost not influential.</td>
</tr>
<tr>
<td>WB3B</td>
<td>15. Skipping a phase, combining the documentation.</td>
</tr>
<tr>
<td></td>
<td>16. The budget plan and design statement were merged into one document, skipping the design phase.</td>
</tr>
</tbody>
</table>

Table 23: All project-specific adjustments.

After the data collection of the case studies the analysis was performed and the research findings were evaluated by an expert panel. The cross case analysis shed light on connections and relations between PM methodologies, the adjustments, their underlying reasons and the contribution to project success. Sub question 4 was answered:

“In what way and to what degree do the fit-for-purpose adjustments contribute to project success?”

The fit-for-purpose project-specific adjustments can be categorized in two ways, as deviations and additions which occur roughly fifty-fifty. These do both contribute to project success, since the majority was indicated to make a (large) positive contribution to project success. Organisation-specific adjustments are present at all waterboards, the theories have been made applicable for the type of projects, e.g. adding a procurement and tender phase.

Although project success has an elaborate and modern definition as discussed in Chapter 4, for the project managers time was the most prominent underlying reason to make adjustments or completions. Also time and budget were the two main success criteria that project managers valued and strived for, which confirms the study of Koops et al. (2017). Therefore it is concluded that fit-for-purpose adjustments occur in the form of deviations and additions, which overall both contribute to project success in a positive way, influencing mostly time and budget criteria.

The 7 experts of the expert panel had different backgrounds that provides solid ground for generalizing the findings: the nature of the adjustments was recognized, the focus on time as underlying reason and the time and budget as two most prominent project success aspects were also recognized. The evaluation by the experts confirmed these findings as generally recognizable, therefore it indicates what could be similar for other public clients in the Netherlands as well.
Now the main research question can be answered:

“How do the fit-for-purpose adjustments to the PM methodologies used by public clients in the Netherlands contribute to project success of infrastructure projects?”

Fit-for-purpose adjustments were found to be applied in two forms: organisation-specific and project-specific adjustments. The PM methodologies at the 3 investigated waterboards were tailored to the organisation, but also showed project-specific adjustments to the 6 investigated projects. These project-specific adjustments occur in many forms. They range from e.g. additional financial mandate, to shared risk registers and skipping phases or phase documentation. These adjustments can be categorized in two ways, deviations and additions to the PM methodology (roughly half-half). The overall majority of these adjustments was said to contribute to project success in a positive way, having a (large) contribution to the success of the project. Project success is in general perceived by the interviewed project managers as mainly a focus on time and budget, and from the underlying reasons for these adjustments time was the most prominent aspect, therefore time related adjustments contribute most to project success.

8.2 Recommendations

From the results of this research, its conclusions and limitations a list of recommendations can be defined. This is split up in scientific recommendations (sub section 8.2.1) and practical recommendations for project management professionals in practice including for the commissioning company Balance (sub section 8.2.2).

8.2.1 Scientific recommendations

Scientific recommendations are the recommendations for future research, how this research could be used as a starting point for future researchers or graduation students.

- For future research projects it would be good to investigate further how the relationship between adjustments to the PM methodology and project success is, this is a weak link of this thesis since it is only the words of the interviewed project managers that have to be trusted. Objective measurements should be used based on project documentation, or more involved persons (e.g. from the rest of the project team) could be interviewed next to the project managers and their internal clients.
- The amount of project-specific adjustments found in the 6 investigated projects seems to be limited, a quantitative study covering more projects could be performed, investigating the occurrence of adjustments to the PM methodologies in a statistically significant way. Such a quantitative study would also be able to make distinctions between the amount of adjustments per PM methodology (e.g. the difference in needed adjustments for PMC versus PRINCE2).
- A theoretical framework to evaluate the impact of adjustments on the project could be interesting (later the link to project success could be added). Aspects that could be included in such a framework are the area of impact (e.g. documentation, risk management, budget), the timing of the adjustment, involved actors, if the adjustment is temporary or if it is changed permanently for the rest of the project...etc.
- This research focussed on the infrastructure projects of public clients in the Netherlands, where some underlying organisational similarities could play a role in the perceived project success criteria. Also the specific project managers that were interviewed could have caused an “execution-bias”. To be able to generalise the outcomes of this study, additional research would
be recommended into adjustments to PM methodologies for the entire scope of the project to eliminate such a bias. Additional research at private clients and in other sectors could be interesting as well.

- If more research time would be available it would be interesting to further investigate the underlying reasons for adjustments to the PM methodologies, perhaps there are more implicit or secondary reasons.

8.2.2 Practical recommendations

Practical recommendations are recommendations for both the organisations that took part in the case studies, as other waterboards, public clients and project management and consultancy firms like the commissioning company Balance.

- From this research it is concluded that all organisations made organisation-specific adjustments to make the official theories applicable for their projects. Next to this, project-specific adjustments occurred as well, although this amount of adjustments (16 over 6 cases) seems to be limited. The 16 adjustments have been individually assessed and for 7 of these adjustments it is recommended to include them as best practice in the organisation-specific methodology (to include it in the guideline). The adjustments 1, 4, 5, 9, 10, 11 and 12 from Table 19 are rephrased as recommendation:
  
  o For the project managers financial mandate is defined, but time mandate should be defined as well since rules about that are not automatically clear. This could be set to zero time delay, or to a certain amount of weeks or months depending on the size or complexity of the project.
  
  o The start and end of each phase should be clearly described in the guidelines to ensure that project managers do not need rephrasing.
  
  o For all projects it would be recommended to share the risk register with the contractor. For strategic reasons this could be partially transparent (75% e.g., leaving out internal or financial risks). This would not only increase the visibility and awareness of risks, but also contribute to collaboration and better risk distributions and mitigations.
  
  o The organisation-specific methodology can sometimes be an overload for small projects, therefore an elaboration on which elements to include or leave out could be added as an appendix (this could be done for a few scales of size and complexity of projects e.g.).
  
  o The IPM model is widely used within public organisations that perform infrastructure projects, and contributes to an integral approach of project management. For organisations who currently not use this IPM model yet (waterboard 3), this could be a valuable addition to the organisation-specific methodology.
  
  o Financial mandate for project managers should be defined, although setting it at €0,- is experienced as hindering for the project (for each small change the project manager has to go back to her internal client and ask for permission to spend more when needed). This research did not provide results or argumentation on what the height of such a financial mandate should be, however it would be strongly recommended to perform a benchmark at other waterboards or similar organisations and provide the project manager with a little bit more room to manoeuvre.

- For internal clients and organisations with in-house project departments it is recommended to formulate an organisation-specific definition of project success if it is not present yet. This could contribute that all project managers see project success in the same way, and work together towards one clear goal and avoid different interpretations (e.g. budget over time or time over budget, or placing the communication with the environment first). When this organisation-specific project success definition is realised, it is recommended for project managers to define
project success for their specific project as well, especially if it is performed in collaboration with other client organisations, to align expectations as well.

- For a project management and PM consultancy firm like Balance it would be advised to steer on this definition of project success as well, to first identify what are the most important success criteria. Depending on the size of this organisation (the amount of projects on a yearly basis), a position can be taken in relation to adjustments to the PM methodology. If the organisation has the flexibility to allow (minor) deviations or additions this could contribute to the success of the individual projects.

- The amount of project-specific adjustments found seems to be limited, and the positive contribution to project success (based on the research of Van Aken (2009)) is not one of the most influential factors on project success. This means that for the practice of a PM consultancy firm like Balance it would not be recommended to put much focus on advising on project-specific adjustments. This is not because it is unimportant, but because perhaps greater differences can be achieved in other areas of project management like collaboration and leadership. However, the adjustments found and practical recommendations based on these adjustments should be taken under advisement and could be implemented when the opportunity for implementation arises.

- For Balance it would be recommended to perhaps take on a next graduate student to do future research regarding which PM methodologies need more adjustments, to be able to use the findings from this research at specific clients working with specific methodologies.
8.3 Personal reflection

To this thesis I would like to add a personal reflection on the past 6 months, what I think about the research results, what I could have done differently in hindsight and how I experienced the process.

Although I started this research with the idea in mind that I would change the construction world a little, I soon discovered that this was not going to be the case. The more you learn, the more you realise how little you know. Of course eventually I am the specialist on my own research, but this entire research is only a tiny part of PM methodologies, and an even tinnier part of project success or project management. However the topic of adjustments to PM methodologies has not yet been researched on this level, therefore this exploratory research can partially fill that gap of knowledge.

Research results

What do I think about the research results?

When people asked me what I was graduating on I always explained it like this: “I am looking into PM methodologies, the theory on one hand and what project managers do in practice on the other hand. Because I do not believe that a standardised methodology is perfectly suited for every unique project I expect adjustments of the methodology to the projects, and that is what I am looking into.” This belief was the reason why I started with this topic in the first place, but to be honest the results of this research surprised me. Per project manager I interviewed I expected 5 or maybe 10 project-specific adjustments, but the results for 6 case studies in total was only 16 adjustments. Although there was no predefined framework or comparative research to state that a certain amount was ‘small’ or ‘large’, this definitely feels like very little, especially since only 8 of those 16 adjustments are actual deviations from the organisation-specific methodology.

Next to this, most adjustments are very logical to me, and well suited for the projects: if the methodology is too elaborate for a small project skipping phases or combining documentation makes sense, if a project manager needs room to manoeuvre adding financial mandate is logical and when risks are important for the planning of a time-driven project sharing the risk register with the contractor sounds like a wise move. Project management is a pragmatic profession and I think that shines through all the results quite well.

Differently

With my current knowledge, what would I do differently if I could go back in time to the start of this graduation research?

Looking back on my research, the weakest link is the contribution of the adjustments to project success, exactly the part I was most curious about. Giving the limited time scope I could not have done it completely different, therefore if I could go back in time I would skip the orientational phase to save roughly 2 months. I found it very interesting to travel to all kinds of organisations and speak to many different people about their projects and the methodologies that those organisations use. However, compared to the rest of this research, the 2 months that it took could have been spent more effectively. This would have influenced the narrowing down of the scope, but this perhaps could have been solved differently by cold calling organisations or just asking around via the network of Balance. If more time was available, the link to project success could have been researched better. This could be done by making an assessment of the success of the projects based on the 6 project success of Bakker et al. (2010): interviewing the contractors for the ‘no accidents’ criterium, the client about the ‘happy client’ and ‘quality’ criterium, diving deeper into more project documentation regarding ‘budget’ and ‘schedule’ and perhaps interview people from the management department on the ‘start up’ criterium. This would have incorporated the chosen success criteria better in this research. Looking deeper into these success criteria would have made this research more extensive, getting in contact with all the right people might have been problematic as well as working my way through years of project documentation. Next to that, PM methodologies only influence project success to a certain level as
mentioned in this report, this level is not exactly determined therefore even if the success of a project could be assessed the influence of the adjustments to the PM methodology would still be difficult.

Process
Overall I dare to say that writing this thesis was a relatively smooth process; the main hindrance I have experienced was from within myself: certain choices turned out not to be optimal for answering the main research question and (partially therefore) confidence about my work was sometimes lacking. The 34 interviews were really interesting and it was wonderful to have the chance to speak to so many project management professionals who took time to meet me and to answer all my questions. The collaboration with my supervisors and the Balance staff was always enjoyable.

Overall opinion
Although at most times I truly enjoyed my research I do not believe that the way my research question was formulated is suited for major breakthroughs or ground breaking discoveries. However the limited amount of adjustments found is surprising, their nature provides insights, and this has pointed out interesting possibilities for future research.
Project success is so much bigger than only the methodologies and PM methodologies play such a minor role, that larger steps in the direction of project success can be taken when looking at other factors like the working styles of project managers and within teams as Van Aken (2009) states. This relation between the adjustments and project success was weak in the end, although it might have been a bit too ambitious from the start.
Eventually PM methodologies are meant to be a support for a project and should not be declared sacred nor should it be strived for at any cost. Although I have investigated methodologies and the practice of methodologies for months, this would be my main ‘lesson learned’ next to all the practical and small details about project management I picked up along the way.
However my career may turn out to be in the future, I will definitely remember my graduation research as an interesting journey, not specifically a lonely journey as it is often described but neither something I would do again any time soon ;-)

Catharina de Jong
July 2018
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**Interview references**


This master thesis is the final research project for the master Construction Management & Engineering at the Delft University of Technology. Practice is often different from theory and this research is exactly about these differences: how project management of Dutch infrastructure is made fit for the purpose of unique projects.