

The adaptation of the IPM model to a municipal organization

Exploratory study

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Preface

This report presents a thesis research as the final step to complete the Master Program Construction Management and Engineering at the Delft University of Technology. The study was executed to demonstrate the student's/candidate's ability to perform scientific research in the field of project management, using data abstracted/obtained from practice to gain knowledge for practitioners and researchers.

The research would never have been achieved without the supportive and open setting of the Ingenieursbureau (IB) Amsterdam. With the help of Mr. Ineke, Mr. Minnaard, and the IPM kernteam, I was able to move freely through the organization. Employees of the IB are open and always willing to make time for an official interview or a simple conversation. I am grateful for the open attitude that has contributed in great measure to the outcome of this study.

I needed time to understand the organization and develop an objective vision. I am grateful for the support and guidance of the graduation committee which allowed me to improve gradually. Special gratitude goes out to my first supervisor, Mrs. Bosch-Rekvelde, for the time she has invested to guide and discuss the written pieces.

A thesis project is, beside a scientific undertaking, also a personal challenge for the researcher. It demands a specific focus over an extended period. A student's environment can have a positive or negative effect on it. The support of friends and family is crucial to stay motivated and keep moving forward. Special thanks go out to Mrs. Suarez for critically reviewing work and Mr. Harleman as talking partner at the IB.

B.J. van Eeden

Amsterdam, December 2017

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Summary

Rijkswaterstaat (RWS) is responsible for the design, construction, management, and maintenance of the central infrastructure facilities in the Netherlands. To improve project management, RWS developed a management methodology called Integral Project Management (IPM). At the basis of the IPM model are seven construction processes which are present in a project and the management methodology Projectmatig Werken (PMW). The IPM model ensures that both the seven processes and the PMW are used in practice by prescribing a structure in which five roles work together to form a team. With a clear distribution of tasks, the IPM model creates a structured, open discussion format among the five functions in a project. The dialogue ensures that all aspects of the project are taken into account before a decision is made.

Decentral governmental organizations copy the IPM model as a management structure for their construction projects. One of the agencies is the Ingenieursbureau (IB) of Amsterdam. RWS projects are larger regarding scope, budget, complexity and use of manpower, whereas the IB executes besides larger also smaller, less complex projects. The use of the same project methodology on different types of projects raises the question how the model is used in practice. The current study investigates the use and possible adjustments of the IPM model for IB projects by answering the following research question:

Which adjustments should be made to the IPM model to make it suitable for projects of the host organization?

To answer the main question four sub-questions are formulated:

- *What is the current status of the IPM model in the host organization?*
- *What is the current practice of applying the IPM model in the host organization?*
- *Are adjustments needed to the IPM model for the projects of the host organization?*
- *Which adjustments may be made to the IPM model?*

In the IB organization, it is not clear what the current status of the IPM model is. The model is being introduced as an optional management method, and project managers are free, but not obliged, to use it. A team has been appointed to bring the IPM model further into the organization, but this faces difficulties in adjusting the model to the needs of the organization. The IB does not have an overview of the finished and ongoing projects, because there is no project portfolio management. The lack of portfolio management makes it hard to assess the performance of the projects and the way they are managed. The larger, more complex IB projects use the IPM model, but when projects become smaller and less complex, the IPM model is not always used.

This report contains a multi-case analysis in which 8 IB projects are studied. The study shows that the IPM model is applied in different ways among the cases. The 8 cases are managed in the following way:

- Case 1 used the IPM model in the overarching team but not in the project team.
- Case 2 a full IPM team was created with five members.
- Case 3 adjusted the IPM model by combining four roles on to two team members
- Case 4 a full IPM team was created with five members.
- Case 5 no IPM model was used.
- Case 6 no IPM model was used.
- Case 7 no IPM model was used.

- Case 8 (still on-going) uses the IPM model in an overarching team, managing several sub-projects.

Comparing the 8 cases in a cross-case analysis shows that in some cases the use of the IPM model affects the efficiency of less complex projects in a negative way. The “top-down” approach of distributing the tasks over the 5 IPM roles does not provide the opportunity to make practical adjustments. The teams are too large for the project, resulting in islands to form in the team. Adjusting the IPM model by combining roles does not improve efficiency. The team still had to include external resources in meetings, resulting in unnecessary discussions and affecting efficiency in a negative way. Projects which do not use the IPM model are managed with a “bottom-up” approach. In the “bottom-up” approach the project manager assesses the project and distributes the tasks among the available resources, taking their expertise into account. The IPM model should be adjusted to make it possible for a “bottom-up” approach to be applied in the smaller, less complex IB projects.

To adjust the IPM model from a “top-down” to a “bottom-up” approach the task division of the five working fields is removed. The basis of the IPM model, the seven processes and the management methodology Projectmatig Werken (PMW), is still used. The projects are assessed on the seven process and tasks are formulated by the project manager. The tasks are divided among the available resources taking their expertise into account.

The “top-down” and “bottom-up” approach can be combined in an overarching IPM team that is executing several smaller less complex projects of the IB. The sub-projects are managed overall by the “top-down” created IPM team and “bottom-up” in the sub-teams. The overarching IPM team can create cohesion among the sub-projects by assessing the total project, whereas the “bottom-up” approach provides the possibility to assess the sub-project individually and formulate project specific tasks, leaving room for adequate flexible management on site during execution.

Further research is recommended in three areas:

- The use of the IPM model in other multi-project organizations should be further investigated. The context of the IB on the projects could have an effect on the performance that is not considered.
- Man-hours spent on every project are not included into this study. Using data from the computer program TimeTell, a quantitative analysis can be performed.
- There is little research on management of small projects. A study into management of small projects is recommended, especially resource management in large multi-project organizations that execute small projects.

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List of abbreviations

1S1O	1 stad 1 opgaven
AK1	Amstelkwartier 1 ^e fase
AK2	Amstelkwartier 2 ^e fase
AK3	Amstelkwartier 3 ^e fase
CM	Contract Manager
DIVV	Dienst Infrastructuur Verkeer en Vervoer
FT	Focus team
G&O	Grond & Ontwikkeling
IB	Ingenieursbureau
IBA	Ingenieurs Bureau Amsterdam
IPL	Integral Project Leader
IPM	Integraal Project Management
IPMr	Integraal Project Manager
KWT	Kop Weespertrekvaart
NSML	North South Metro Line
OGA	Ontwikkelingsbedrijf Gemeente Amsterdam
PC	Project controller
PL	Project Leader
PM	Project Manager
PMO	Project Management Office
PMW	Projectmatig Werken
PPM	Project Portfolio Management
RWS	Rijkswaterstaat
SM	Stakeholder Manager
SME	Small to Medium-sized enterprises
TM	Technical Manager
V&OR	Verkeer & Openbare Ruimte
WMZ	Weespertrekvaart Midden Zuid

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1 Introduction

Construction in the Netherlands involves significant challenges, because of the relatively scarce land, high population density, and requirements on spatial planning (Mein Select, 2015). The complex situation affects project performance, as can be seen at underperforming construction projects such as the Amsterdam metro “Noord-Zuid Lijn,” the renovation of “Rijksmuseum” in Amsterdam, and the Schiphol-Antwerp high-speed railway. There is a continuous necessity to improve the construction process and minimize complications by doing research into project management (Söderlund, 2004).

This Chapter elaborates on a phenomenon in Dutch public organizations which are responsible for the management of construction projects.

- Section 1.1 explains the need for a general management methodology at Rijkswaterstaat (RWS).
- Section 1.2 gives a description of the internally developed management model.
- In Section 1.3, the phenomenon of copying the management methodology by other public organizations is discussed.
- Section 1.4 explains the issues that the introduction of an external management structure creates. Thereby introducing the problem of the research presented in this report.
- Finally, the report structure is presented in Section 1.5.

1.1 The need for a uniform management model

One of the biggest governmental organizations in the Netherlands which executes ground, road and water construction projects is RWS. In 2003, a study was conducted on the management style of 50 RWS projects by the consultancy firm Berenschot Groep. The research showed that all 50 RWS projects were managed in a different way (Jongkind & Sons, 2003). RWS decided to develop a uniform and standardized way of managing their projects to improve their performance (Rijkswaterstaat, 2008). The uniformity and standardization is necessary to increase the efficiency of the deployment and exchange of resources, make for better project management control and for achieving a more professional approach to the outsourcing to market parties (Wermer, 2012).

To come up with a solution, RWS has recognized project management as a professional discipline and has distinguished seven sub-processes present in every phase of a construction project (Wermer, 2012). The seven sub-processes, visualized in Figure 1, are:

- project management,
- project control,
- market approach,
- design, effects, and technique,
- conditioning,
- political decision-making,
- public participation.

1.2 The IPM model

The foundation of RWS project management model is found in project management methodology “Projectmatig Werken” (PMW) developed by the project consultancy firm Twynstra Gudde (Wermer, 2016). The PMW method combines four project-processes with three core pillars (Kor, retrieved 2017; Twynstra Gudde, retrieved 2017). The four project-processes of the PMW are:

- Interaction within the project team to improve the co-operation.

- Organization with a clear description of daily tasks and project work flow.
- Stakeholder management by taking into account the interests of the stakeholders in the project.
- Creating a method on decision-making for project scope

The three core pillars are(Kor, retrieved 2017):

- phasing,
- decision-making,
- control

The seven sub-processes combined with the PMW management methodology serve as the basis to create a standard for organizing and managing projects in RWS (Rijkswaterstaat, 2008; Wermer, 2012, 2016). The uniform way of co-operation within the organization is called "Integraal Project Management" (IPM) model. The model divides the seven sub-processes into five working areas who are represented by a manager. The five working fields are:

- project manager (PM)
- project control (PC) manager
- contract manager (CM)
- technical manager (TM)
- stakeholder manager (SM)

The appointed sub-processes are shown in Figure 1. The stakeholder manager (SM) is accountable for three sub-processes. The model provides room for discussion and interaction to thoroughly weigh the various interests of the five managers (Rijkswaterstaat, 2008). With the appointment of a stakeholder manager the interests of stakeholders and the project's interested parties is assured (Wermer, 2012).

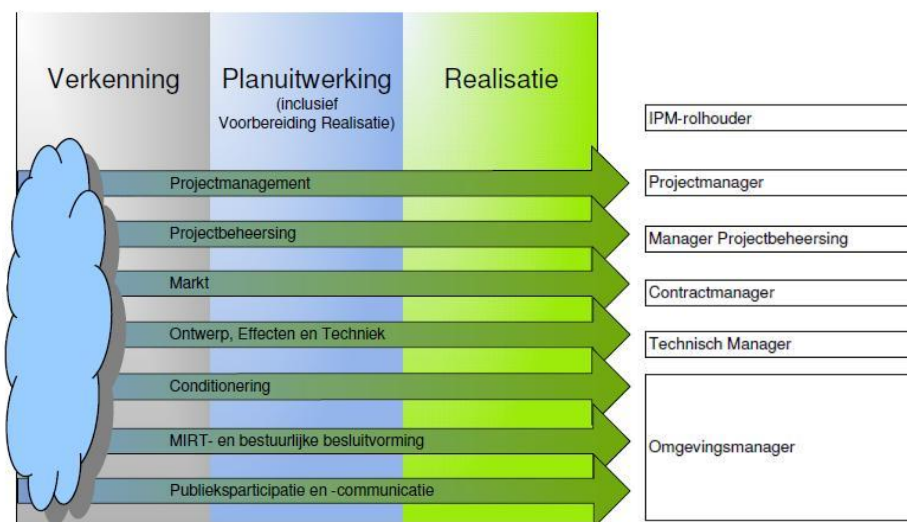


Figure 1 (in Dutch) The seven sub-processes in the three phases and the responsible role that is the basis of the IPM model (Wermer, 2012)

To create a constructive discussion in a project team, the managers are at the same hierarchical level (Rijkswaterstaat, 2008). To show the possibilities for dialogue within the team the organizational structure, as illustrated in Figure 2, is placed in the shape of a triangle and not as a layered structure. The project manager is responsible for communications with the client. Together the project manager and client formulate a clear scope of the project. The stakeholder manager is responsible for managing and

communicating with political and local stakeholders. Selection process and communications with the contractor is the task of the contract manager.

RWS has been working with the model for ten years and in that time has created a uniform project language. In their opinion, the project language has improved co-operation and reduced miscommunication, allowing better coping with complex projects (Wermer, 2016). IPM structure has enhanced the profession of project manager within RWS. Furthermore, IPM facilitates the exchange of resources among projects, because of the same organization standard. The link to knowledge, processes and even organizational structure has been improved. Because IPM is now used by other governmental organizations, the co-operation improves between RWS and other organizations.

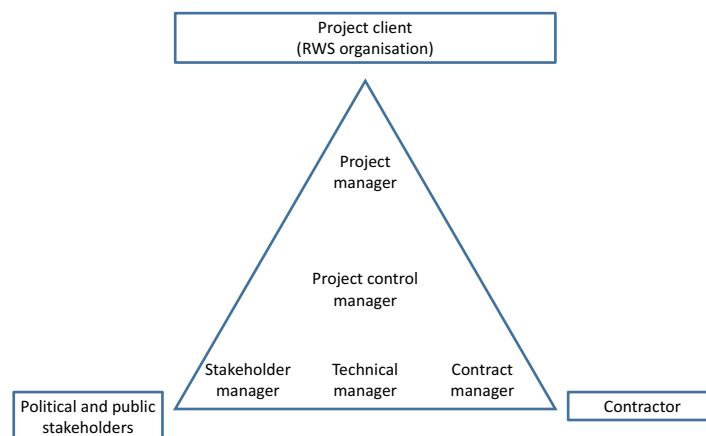


Figure 2 The IPM project team is placed in the triangle with the project client, stakeholders, and contractor (Rijkswaterstaat, 2017)

1.3 Adaptation by other multi-project organizations

The positive effect of the IPM model on the projects of RWS has been noticed by other decentral governmental project institutions, and they decided to use the model in their projects (PPS Netwerk Nederland, 2017). One of the organizations is the engineering department of the municipality of Amsterdam, called the Ingenieursbureau (IB). The IB is responsible for all construction and maintenance projects in the city. A division of the IB has been using the IPM for the organization of project teams from 2013 (Gemeente Amsterdam, 2013). After the reorganization in 2014 the IPM model is selected as management structure for the IB organization and IB is in the process of adapting to the IPM methodology (Ineke, 2015).

The IB is looking for the same improvements on project management as RWS. Therefore the decision has been made to start adopting the IPM model into the projects (Kernteam IPM@IB, 2015). The four reasons for implementing IPM are:

- Better stakeholder management in a city environment
- Improve decision-making by creating an environment for discussion in project team
- Sharing project knowledge among team members to cope with complexity
- Create role maturity to further improve discussions in project teams

1.4 Practical problem

The IB and RWS are both responsible for the realization of civil engineering projects. The agencies differ in the dimension and the projects they execute. Whereas RWS has a budget of 5.3 billion euros and 8000

staff in 2015, IB had around 300 million euros and a workforce of 500 (Gemeente Amsterdam, 2014; Rijkswaterstaat, 2016). The project portfolios of both public institutions are compared in Table 1.

Table 1 A global overview of project characteristics of Rijkswaterstaat and IB Amsterdam.

Project characteristics	Rijkswaterstaat	IB Amsterdam
Duration	> 4 years	1–4 years
Budget	> 50 million Euro	50,000 –10 million Euro
Complexity	High complexity	High and low complexity

When applying the IPM model to the management of the projects of the IB, it provides insufficient work for all the five roles. To cope with the work shortage, resources work on multiple projects at the same time and have multiple roles in a project team (Kernteam IPM@IB, 2015). An important part of the IPM model is the discussion among the five managers (Rijkswaterstaat, 2008). Without enough people, there is a chance that the interaction in the project team does not take place. Without the discussion, there is a possibility that the benefits for implementing the IPM model into the IB projects are not realized. This raises the questions how the model is used on the different projects of the IB and whether the model can be adjusted for their type of projects. The results of this study could be used by the IB to further develop the IPM model for their projects.

1.5 Report structure

This report is structured as follows:

- To formulate an answer to the problem described in Section 1.4, [Chapter 2](#) presents the research design.
- In [Chapter 3](#), the host organization and the way the IPM model is introduced is studied to provide context for the rest of the research.
- Eight projects are selected to perform case studies in [Chapter 4](#).
- The case study data will be cross examined in [Chapter 5](#) where more generic answers can be formulated on the use and adjustment of the IPM model for the projects of the IB.
- In [Chapter 6](#), managerial implications for practical implementation of the adjustments of the IPM model at the IB are presented.
- Finally, the conclusions and recommendations are presented in [Chapter 7](#).

2 Research design

This Chapter presents the research design to investigate the use of the IPM model on projects of the IB and how the model can be adjusted to their projects.

- In Section 2.1 the research objective is discussed.
- Section 2.2 presents the main research question and four sub-questions.
- Section 2.3 discusses the research methodology.
- In Section 2.4 the social and scientific relevance of the research is formulated.

2.1 Research objective

The IPM model is introduced to the IB organization and applied to their projects. The goal is to research the use of the IPM model in different projects of the host organization by an exploratory empirical study. The research will provide an insight on applicability and adaptability of the model in practice. Finally, to formulate adjustments for the use of the IPM model in the projects of the IB.

2.2 Research question

The main research question of this study is:

Which adjustments should be made to the IPM model to make it suitable for projects of the host organization?

To give an answer to the main question, four sub-questions are defined:

1. *What is the current status of the IPM model in the host organization?*
2. *What is the current practice of applying the IPM model in the hot organization?*
3. *Are adjustments needed to the IPM model for the projects of the host organization?*
4. *Which adjustments may be made to the IPM model?*

2.3 Methodology

The four sub-questions are used to answer the main research question. Figure 3 shows the methodologies used for every sub-question. At the start of the study meetings have been planned with all members from the team responsible for implementing the IPM model at the IB. To make good use of the meetings semi-structured exploratory interviews were held to gather data in order to understand the context of the projects and the implementation of the IB model.

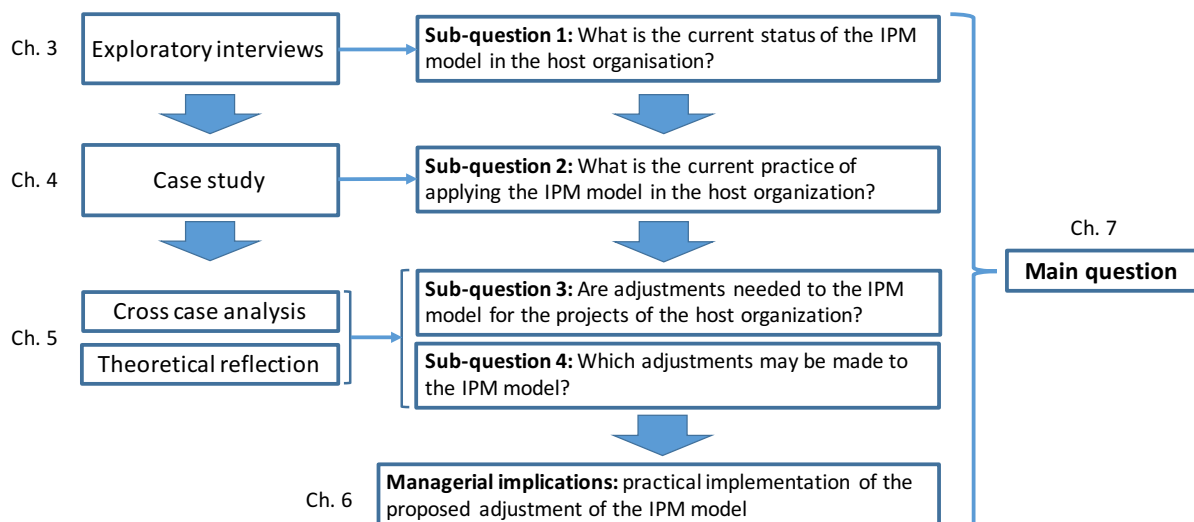


Figure 3 The research methodologies used to answer the sub-questions and main question

The exploratory interviews and observations were used to answer sub-question 1 (Figure 3). The exploratory interviews were performed with the team responsible for implementation of the IPM model into the organization. Interviews helped to understand the IB organization and provide context for projects selected later in the research.

Eight case studies were performed to gather empirical data. The case studies focus on the project characteristics and performance, project organization and roles, management in practice, and the possible use of the IPM model. The data collected have been analyzed per case to provide an answer for sub-question 2.

The data gathered from the case studies have been used in a cross-cases analysis. The cross-cases analysis shows similarities and differences among the eight projects. The findings are used to answer sub-question 3, if an adjustment is needed to the IPM model of the projects of the host organization. Subsequently, the findings of the cross-cases analysis have been used to formulate an adjustment to the IPM model to make it applicable for the projects of the host organization.

During the study, the researcher gathered insights of the practical use of the IPM model. For further implementation of the model managerial implications are presented in Chapter 6, combining the findings of the study with ongoing developments at the IB.

2.4 Relevance

2.4.1 Social relevance

The outcome of the research on the use of the IPM model on the project of the IB, is first of all relevant for the IB itself. The study shows how projects are managed and how the use of the IPM model can be beneficial. The IB can use the research to further develop the IPM model for the projects they execute. Furthermore, other governmental organizations can assess the research and use it as input for possible changes to the IPM model for their projects.

2.4.2 Scientific relevance

The IPM model is being introduced as a management methodology by other governmental organizations (PPS Netwerk Nederland, 2017). Because other organizations are introducing the IPM model, it is becoming a standard for Dutch construction management organizations. Hodgson and Cicmil (2007) and Morris, Crawford, Hodgson, Shepherd, and Thomas (2006) state that the research community has to perform empirical research on the practical use of project management standards to retain a critical view of the limitations. This report presents the results of a study of the use of the IPM model at a municipal organization. It aims to provide new knowledge on the use and adaption of the IPM management model in the management of projects in decentral governmental organizations.

3 The current state of the IPM model at the IB

All projects are linked to the context and time frame they are executed in (Engwall, 2003). In the past projects were researched as detached entities, but the concept that a project is a temporary organization changed the approach (Lundin & Söderholm, 1995; Packendorff, 1995). For a comprehensive study on the use of the IPM model in the projects of the IB the context of the organization and the current status of the IPM model has to be explained.

In order to gather the necessary information for describing the organization and the status of the IPM model in the organization exploratory interviews and observations of meetings were held. Six semi-structured interviews were performed with the team members of the IPMKernteam, responsible for introducing the IPM model to the IB. The researcher also observed several meetings of the IPMKernteam and the IPMfocusteam. The information obtained from the interviews and the two meetings of the IPMkernteam are included in Appendix A and Appendix B. With the data from the interviews, observations, and organization documents an answer may be given to:

Sub-question 1.: What is the current status of the IPM model in the host organization?

The goal of this Chapter is to present an answer to sub-question 1 as follows:

- In Section 3.1 the IB is introduced to describe the context of the organization.
- In Section 3.2 an explanation is given on how the IPM model was introduced to the IB and how it is being used by the staff.
- A conclusion is presented and sub-question 1 is answered in Section 3.3.

3.1 The IB as host organization

The IB is the engineering department of the municipality of Amsterdam. The IB is responsible for advice, tendering and realization of all projects on infrastructure and public space (Gemeente Amsterdam, 2014). The project tasks include construction, replacement, renovation, maintenance and management. The IB performs multiple projects at the same time and can therefore be called a multi-project organization (Nicholas & Steyn, 2017).

3.1.1 Merge of ten departments into one organization

In 2014 ten engineering departments were merged into one organization, as part of the 1Stad1Opgaven program (1S1O) (Gemeente Amsterdam, 2014). 1S1O is a reorganization program of the municipality to lower the cost of labor and improve the quality of their work. This is to be achieved by a more professional and active organization that is capable of using the market by efficiently using contractors for executing work. The ten departments consist of:

- DIVV Projecten (Dutch: Dienst Infrastructuur Verkeer en Vervoer), with 62 staff.
- IBA (Dutch: Ingenieurs Bureau Amsterdam) with 230 staff. Not to be confused with the current IB.
- OGA (Dutch: Ontwikkelingsbedrijf Gemeente Amsterdam), with 30 staff.
- Seven city districts with a total of 194 staff.

Every department is responsible for a certain type of engineering project.

- DIVV Projecten is responsible for infrastructural engineering projects, specifically the maintenance and improvement of the central transport network of Amsterdam.

- IBA has a design and consulting role in the municipality.
- OGA has the task of developing housing, work and living facility projects.
- The city districts have projects on ground level, repaving streets and building environmental assets such as playgrounds and small parks.

Combining the ten departments an organization was created of 515 people.

A market analysis was performed to predict the resources needed in the future for the IB (Gemeente Amsterdam, 2014). An estimate was made that with the possibility of easier exchange of people in one organization, around 414 FTE would be needed in 2017. The predictions did not consider the economic growth of recent years. Growth has been so rapid that the organization had to respond by hiring new staff. At the time of the interviews, in March 2017, the number of staff is around 800, twice the amount for which the organization is designed.

3.1.2 Structure

The structure of the IB organization is visualized in Figure 4. The organization has one general manager. Below are three main clusters in which all 19 teams are bundled (Gemeente Amsterdam, 2014).

- The first, project management (PM) cluster consists of five teams. Four teams classified as area-oriented and one specialized on infrastructural assets. In the project teams, the roles of Integral Project Manager (IPMr), Contract Manager (CM), Stakeholder Manager (SM) are housed.
- The second cluster is technical management and advice. The cluster consists of five ground level teams (MV) and four specialized asset teams. In the ground level teams, technical ground experts, project management, job preparation, site management and site supervision have been accommodated. The specialized asset teams are made up of specialists and advisors in a number of engineering disciplines.
- The last cluster encompasses the tender, advice, and support functions. There are three teams in the cluster. Expertise is on branch-specific legal knowledge and specialists in the field of market approach, contracting, contract management, cost expertise, analysis, project control, risk management, and planning. Every team has a team leader who is responsible for a team of around 30 staff at the moment of the merge. The rapid growth of the organization caused several teams to grow to around 80 people at the time of the interview (Appendix A).

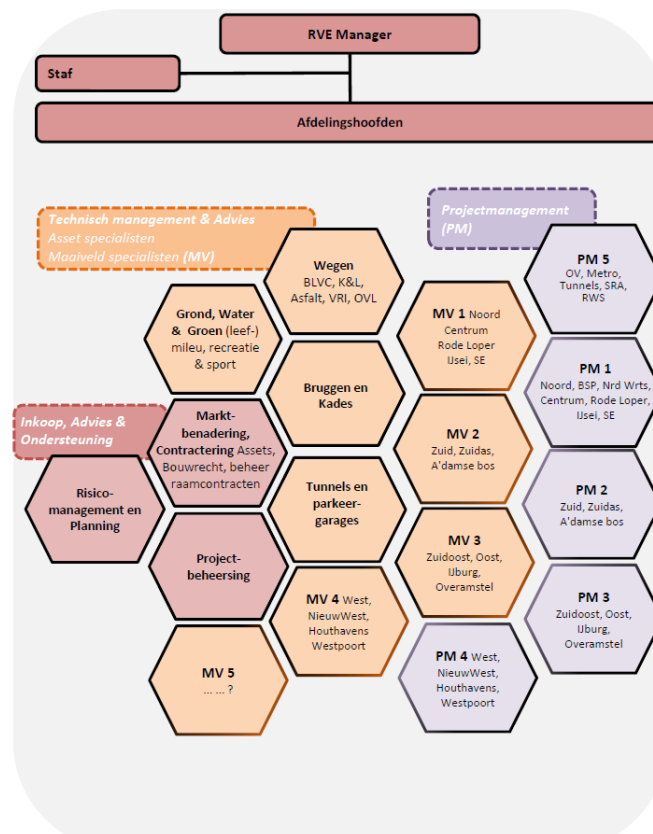


Figure 4 (in Dutch) Organization structure of the IB with the three departments and 17 team. In red procurement advice and support department (three teams), in yellow technical management and advice department (nine teams), and in purple project management department (five teams) (Gemeente Amsterdam, 2014, p. 18)

As a rule, a project team is created by one of the team leaders from the PM teams (Appendix A). First, a project manager is selected who then proceeds to gather resources to execute the tasks. At the IB all resources are responsible for their own placement in projects. Project managers actively search for new resources, selecting them on the basis of their knowledge, expertise and personal relationship.

Staff works on multiple projects at the same time and are not restricted to a certain area (Appendix A). As a left-over from the merge, there are several offices throughout the city. This makes for a situation where project team members work most of the time by themselves. Internal communication happens by means of planned meetings and email.

3.1.3 Development of management methodology

At the IB there is no distinct department that is fully responsible for creating an organization-wide management methodology for all its projects (Appendix A). The tasks of a Project Management Office (PMO) are divided among three places in the organization.

- General management that approves the adaptation of the IPM model at the IB and new construction innovations programs such as Building Information Modelling (BIM) and Systems Engineering (SE).
- The Team Leaders who are account holders with the various clients and steer project managers in the management methodologies they use.
- The IPMkernteam who are appointed with the task to further develop the IPM model for the IB.

The IPMkernteam is a separate workgroup consisting of eight people (Appendix A). During a meeting once a month, the group discusses the strategy and progress of the development of the IPM model at the IB. The team reports directly to general management of the IB, as visualized in the structure of Figure 5. The five roles of the IPM model have a separate Focusteams (FT) that has one representative in the IPMkernteam.

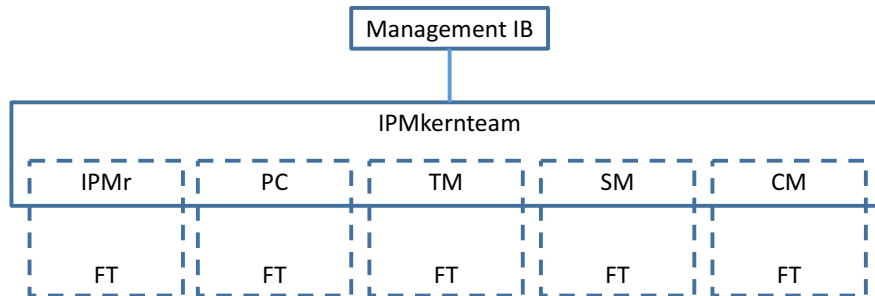


Figure 5 Organization of the IPMkernteam and five focusteams (FT) who represent a IPM role at the IB.

The discussions during the meetings showed that the team is searching for a strategy to further introduce the IPM model in the organization, at the moment of the observation. The five Focusteams are at different stages in developing an individual program for their IPM role. The TM's Focusteam is not complete yet and is still in an orientation phase, whereas the IPMr's Focusteams is further advanced. The IPMr's Focusteam is developing a learning structure to assist the IPMr in the organization. In the development of the individual programs there is a discussion on task distribution between roles. Tasks such as conditioning of the building site and mapping the needs of local stakeholders are carried out by people performing different IPM roles in different projects. This points to a difference in understanding of the nature of the IPM model among the various project teams and would seem to nullify the objective of the introduction of the IPM model into IB: a common practice in executing projects throughout the organization.

There is a substantial discrepancy between the perception of the role and responsibilities of the IPMkernteam by general management on the one hand and the project teams on the other (Appendix A & Appendix B). IPMkernteam members are invited to the team by general management. However, no budget in terms of man hours or training is made available for their IPMkernteam work and members are expected to do their IPMkernteam work in addition to their normal, project related work. The latter has a higher priority at all times, making for difficulties in the arrangement of their work for the people concerned. This difficulty fundamentally arises from the fact that man hours spent on a project are not booked as costs. If that were the case, project managers would refuse to allow resources to book man hours spent on overhead and/or work for the organization in general ("indirect man hours") on their project and thereby force general management to make time and budget available for such tasks as they think valuable.

As matters stand today, the role of the IPMkernteam is confined to being a source of information for co-workers throughout the organization and as the go-to place for project team members who want to question the way the IPM model is implemented in their own project. Members are viewed by the rest of the IB as the representatives of general management's preferred methodology for carrying out projects, without having the opportunity to extend and further their knowledge on the subject. The team is currently in the process of attempting to formulate an opinion on new management standards.

The IPMkernteam shows similarities to a PMO in literature (Nicholas & Steyn, 2017). The team is separate from the organization and has the task to formulate a general management methodology for the IPM

model. Where the IPMkernteam falls short of the PMO is the lack of responsibility and budget that minimizes the impact on the organization. The main focus of every team member is on the project they are active in which prevents them from creating a generalized view during discussions on management methodologies for the whole organization. Finally, the IPMkernteam only focus on the use of the IPM model and not all projects are managed with the IPM model. Some of the projects that the IB executes are not represented during the discussions.

3.1.4 Clients

The IB's projects come from three types of clients within the municipality:

- V&OR (Dutch: Verkeer & Openbare Ruimte) is responsible for the accessibility, safety and quality of Amsterdam's public space (Gemeente Amsterdam, 2017c). They are the owners of the main traffic and transportation system of the city. V&OR decides on urban programming and budgeting of interventions in public space. Projects that V&OR include parking garages, bridges, and tunnels.
- G&O (Dutch: Grond en Ontwikkeling) has the task to manage the municipal objectives in the field of area and real estate development (Gemeente Amsterdam, 2017a). G&O is responsible for urban development projects and transformations. Projects the IB executes for G&O are site preparation and management of planning projects.
- Finally, the seven city districts focus on internal development. Area development and the reconstruction of public streets and squares are executed by the city districts (Gemeente Amsterdam, 2017b). When replacement of roads and streets needs to be organized, the IB takes responsibility for the management and procurement of the project.

3.1.5 Portfolio management

The team leaders of the Project Teams also carry the role of account managers and are therefore responsible for communication with the clients (Gemeente Amsterdam, 2014). The team leaders have overview of their resources and the workload. In combination with the client decisions are made on initiating new projects, but it is difficult to control the growth of new projects.

There is no general overview of upcoming or ongoing projects at the IB (Appendix A). The hours spent by resources on a project are tracked in the computer program TimeTell to claim the costs from the client. TimeTell is not used for resource management on the ongoing projects, because employees themselves have to search for work. Projects specific data is stored in a separate document on the IB's group server. General project data, such as project performance on budget and time, is not stored and projects are not reviewed when finished. The lack of a database on project performance made the researcher base project performance on interviews with project team members.

3.2 Introducing the IPM model to the organization

The decision to introduce the IPM model started at DIVV Projecten (Figure 6). Before the merger DIVV Projecten was responsible for the management of the North South Metro Line (NSML). During the construction of the NSML a lot of problems arose (Enquêtecommissie, 2010). A Committee of inquiry did research the causes of the time and budget overruns. In their report, the DIVV Projecten is blamed for incorrect management of the complex project. Recommendations were given that DIVV Projecten had to

improve their project management capabilities. One of the changes made by DIVV was to introduce the Rijkswaterstaat IPM model (Gemeente Amsterdam, 2013).

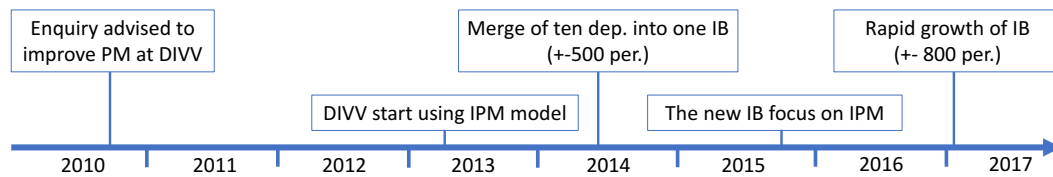


Figure 6 A timeline of the implementation of the IPM model at DIVV Projects and later at the IB.

The implementation of the IPM model at the DIVV Projecten was performed abruptly (Appendix A). A special team was created that invested 50 percent of their time instructing the staff of DIVV Projecten on the use of the IPM model. Project managers were asked to design all future projects with the IPM management model. Staff had to choose one of the five working fields. During the implementation of the IPM model at DIVV problems occurred. Project teams were overstaffed with the five IPM team members. Team members did not know how tasks were divided among roles, which caused miscommunication. However, with the hard implementation of the model, the DIVV knew that every project used the same management methodology.

After the merger, the IPM model was also introduced to the IB as can be seen in Figure 6 (Ineke, 2015; Kernteam IPM@IB, 2015). General management decided that the IPM model would be used as the general project language for the new organization (Appendix A). The model is introduced with the so-called “Oil-Stain” approach. Project teams are not forced or advised to use IPM, even though it is encouraged by management. With the Oil-stain approach the strategy is to convince people to use the IPM model by their own experience. Slowly the IPM model is spreading throughout the organization like an oil-stain.

With the Oil-Stain strategy the IPMkernteam does not know how many teams are using the model and in what way (Appendix A). Every project manager has his/her own way of working and can use the IPM model when and how he or she sees fit. The size of the project and the type of client play a part in the decision whether the IPM model is used in a project. In larger, more complex projects, there is enough work for an IPM team, the management structure is often used and works properly. For the smaller, less complex projects the IB is searching how to apply the IPM model. V&OR provided the larger projects and are familiar with the IPM model. G&O projects are most of the time simpler and demand less work in comparison with V&OR. The city districts’ projects concern mostly work at street level and provide the smallest projects.

3.3 Conclusion

With the findings from this Chapter an answer is given to sub question 1.

Sub-question 1.: What is the current status of the IPM model in the host organization?

With the merger of ten departments and the resulting decision to change to a soft implementation strategy, the so called “Oil-Stain” approach, it is not clear what the exact status of the IPM model at the IB is. In the new organization, there is no central department that has an overview on the different management methodologies used in the organization. The lack of project portfolio management means that there is no general overview of the on-going and finished projects. The IPM model fits the larger, more complex infrastructure projects of the IB and is used often. When the size of projects decreases, it becomes unclear if and how the IPM model is used.

4 Case studies

Empirical research was undertaken to study the management of projects and the use of the IPM model at the host organization. This consisted of an exploratory study to analyze the project organization, roles, management style, and the use of the IPM model in the IB. The exploratory case study was performed to answer the following research question:

Sub-question 2.: What is the current practice of applying the IPM model in the host organization?

The goal of this Chapter is to present the results of the exploratory, empirical study:

- Section 4.1 explains the case study design, case study protocol, case selection, and data analysis.
- Section 4.2 presents the analysis of the individual case studies.
- Section 4.3 presents a summary of the eight case-analyses and the conclusion to provide answer to sub-question 2.

4.1 Method

The methodology selected to obtain empirical data was to perform a series of case studies. This strategy was selected because of (Yin, 2013):

- the type of research question,
- the extent of control of behavioral events,
- the focus on contemporary events.

The sub-questions focus on 'what', a type of question that is justifiable for conducting an exploratory study (Hedrick, Bickman, & Rog, 1993): The events to investigate cannot be manipulated and are contemporary real-life moments. The relevant people are available to report and comment on what happened, on documentation, and on cultural artefacts.

4.1.1 Case study design

The units of analysis selected for research are projects of the IB organization. Due to the absence of a project portfolio, no general overview of projects could be provided. The researcher had to take a proactive attitude by asking people in the organization for possible projects. In Chapter 3 it was concluded that in larger projects the IPM model functioned adequately. In the studies, the focus was on smaller IB projects. In an attempt to formulate selection criteria, complications occurred. Formulating the project characteristics' boundaries in order to define the unit of analysis meant the possible unjustified exclusion of projects, based on the answers given by respondents. Attempts were made, using the number of team members or budget, but the answers were vague and inadequate. Therefore, the decision was made to try to come to a primary formulation of the unit of research by stating that the projects have to be small and have to be finished or in a finishing phase, but no further specifications were defined.

- A decision was made for a multiple-cases embedded research design (Yin, 2013) for the following reasons: The analytical benefits of replications of the same study provide more robust findings in the study.
- Arriving on a universal conclusion, while comparing cases, provides findings with increasingly generalizable value.
- The IB organization provided the possibility for a multiple-case study.
- Furthermore, the multiple-case studies were performed with an embedded variant analyzing the cases from multiple research units.

The research units in the cases are:

- organization and roles,
- management style, task distribution,
- use of the IPM model.

4.1.2 Case study protocol

A case study protocol was created to provide the same structured approach for each case (Yin, 2013) which will increase the validity of the overall study. Before the interviews took place, the interviewee was asked to send project documents. No documents were received for Case 6. The project documents were studied to get acquainted with the project. During the meeting, the interviewee was asked whether the documents were still up to date.

Every conversation held with an interviewee was taped, with their permission. The same pre-prepared questionnaire with six components, containing 59 questions in total, was used in every meeting, consisting of:

- "General", to obtain basic information of the interviewee and their role in the project and outside the project
- "Team members"; questions were asked about resources involved in the project and their role in the team
- "Project characteristics", to form a general picture of the projects. The TOE framework was used as a starting point where 16 questions were used (Bosch-Rekvelde, Jongkind, Mooi, Bakker, & Verbraeck, 2011)
- "Project execution", formulating operating guidelines for building new teams (Nicholas & Steyn, 2017)
- "Project activities", to make a comparison with the IPM model category "project activities" consist of 16 questions
- "Use of the IPM model" (Appendix C: Case study protocol questions): a discussion held with the interviewee on their views on the use of the IPM model in projects and in the IB organization

With every answer, there was room for an open discussion. To test the pre-prepared questionnaire in practice and get familiar with the procedures of the case study protocol, the researcher conducted a pilot case study (Case 3). The interviewer knew the interviewee of the pilot case study, making the conversation less formal. During the pilot, an item was added by the interviewer (d13). This question was also included in the questionnaire for the other interviews. The pilot is included in the further investigation, the same questions were asked. The final case description was sent to the interviewee for approval before using the data in further research.

The questionnaire was first presented to and revised by the graduation committee before being used in the interviews.

4.1.3 Case selection

The IB organization executes construction projects for three types of clients. It was intended to select two projects for every client type. Thus, six projects would be selected for the case study. Finding projects was more challenging than anticipated. Therefore, projects were selected that were still at a beginning or executing phase (Cases 5 and 8). Eventually, two more projects were found which met the requirement of being finished or in a finishing phase, which ended in a total number of eight cases. For every case, a semi-structured interview was held with the Project Manager. In one case, a Stakeholder Manager was interviewed (Case 4).

Cases presented in Table 2 are from every client type of the IB and are spread throughout the city (Figure 7). Two cases are from G&O, two cases are from V&OR, and four cases are from a city district. The budget of the cases ranges between € 500,000 to € 6.9 million. The overall budget of Case 1 is not known by the IB organization(!). Six cases are finished or in a finalizing phase at the moment of the interview. Case 5 and Case 8 are in execution at the time of the meeting. At the IB there are different descriptions of the person who has final responsibility of a project. The name of the function of the interviewee differs as,

- Project Leader (PL),
- Project Manager (PM),
- Integral Project Leader (IPL),
- Stakeholder Manager (SM),
- Integral Project Manager (IPMr).

Table 2 Cases selected for the case study with information of client, budget, status, and the role of the interviewee.

#	Project name	Client	Budget (€)	Status	Role
1	Amstelkwartier 1e fase	G&O	Unknown	Finalizing	PL
2	Kop Weespertrekvaart	G&O	5,000,000	Finished	PM
3	Weesperplein	V&OR	2,000,000	Finished	IPL/SM
4	President Allendelaan	V&OR	2,200,000	Finished	SM
5	OMOP Zuid	City District South	6,900,000	Execution	PL
6	Kinkerstraat Oost	City District West	2,000,000	Finished	PL
7	Jan Luijkenstraat	City District South	500,000	Finished	PL
8	Watergraafsmeer	City District East	6,500,000	Execution	IPM

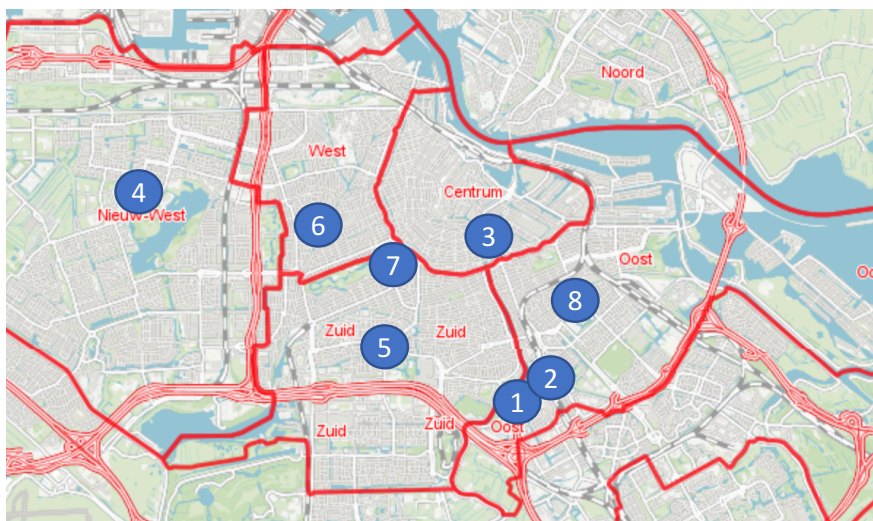


Figure 7 Map with the location of the eight cases.

4.1.4 Data analysis

The qualitative data gathered by the interviews and the project documents are incorporated in the case descriptions in Appendix E. The case descriptions are used for the single case analysis in Section 4.2. Each case is analyzed on four elements as described below.

1. Project and project performance

When analyzing the project and its performance, the following questions are considered:

- What are the primary characteristics such as budget, client, what is the type of assignment and how is it defined? Does the assignment incorporate multiple construction tasks, or only one? Were there scope changes before or during the project?
- Is/Was there a tight schedule and do/did problems occur if the timetable is/was not met?
- Is the construction site in a challenging location, which needs to be taken into account.?
- Were/Are there problems with obtaining resources for the project?
- Was/Is active stakeholder management needed?
- Was/Is there a dependency on external contractors and did/do they create complications during the construction process?
- How did/does the project perform on time and budget?

2. *Organization and roles*

The project organization and roles are analyzed by means of the following questions:

- Is there a management model that is used and if so which?
- Was the model used adjusted before the project started?
- Is the organization described in the project documentation?
- Are there multiple groups in the organization and are the responsibilities described between the groups?
- Are roles mentioned in the documentation and are their tasks defined?

3. *Management in practice*

The management in practice is analyzed by asking the following questions:

- Was there a change in responsibility among the groups in the organization?
- Was there a shift in task between roles?
- Was/Is there a distinction made between people who are included in a decision?
- Was/Is operational decision-making centered or divided in the organization?
- Was/Is overall decision-making centered or divided over the organization?
- Did/Are management complications arise/arising during the execution?

4. *Opinion interviewee on IPM model*

The personal view of the interviewee on the use of the IPM model is analyzed by asking the following questions:

- Does the interviewee have experience as a project manager?
- Is the person involved in multiple projects?
- Does the interviewee have experience with the IPM model?
- Is the IPM model used in the project?
- Is the IPM model useful for similar projects?
- How should the IPM model be used by the IB?

4.2 Case analysis

4.2.1 Case 1: Amstelkwartier 1e Fase

Case introduction

Amstelkwartier 1e Fase (AK1) is a development of a new residential area and part of the overarching Overamstel development project. The project activities are preparing the building site for construction, installing and replacing cables and pipelines, and the construction of a park in the new neighborhood. The site is located in City District East and managed by project team East. The project client is G&O. The data

for this case were gathered during an interview and from project documents. The project is not finished at the moment of the interview, but in a finalizing phase.

Project and project performance

Case 1 is a development project not defined in full detail, and there are different construction tasks to be done. Constant changes are being made to the design and the team had to react to the external contractors on site. Planning is tight, because of agreements with external parties. On the building site, the number of stakeholders and their activities increased over time. Therefore, active stakeholder management is needed. No problems occurred when new resources were needed. Coordination of the contractors of the real-estate and utility companies is complicated by the divided responsibility. There is no overview of the budget, actual expenditures, and planning.

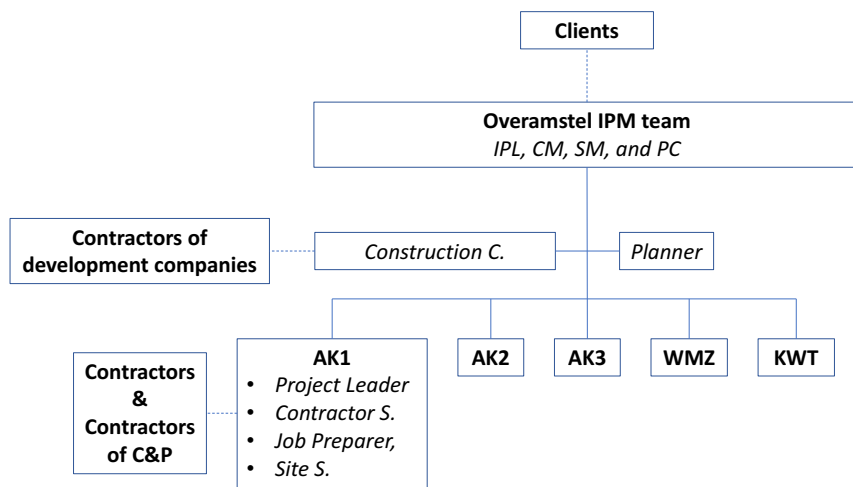


Figure 8 The organization structure of the Overamstel project to describe the position of the sub-project Amstelkwartier 1e fase.

Organization and roles

The overarching Overamstel project organization is managed by an IPM team, but the AK1 team is not. The IPM model is adjusted for use in the project by implementing the roles foreseen by it in a core team at the top of the organization. The project documentation describes the organization with the multiple sub-projects. The responsibilities are described but a clear distinction between the groups is not drawn in the documentation. Some roles are described but not all. For example, the role of Construction Coordinator and Planner are present in de project, but their role and tasks are not mentioned. In the AK1 team, there are three other roles present beside the Project leader. The roles and how the AK1 team is managed is not described in the project documentation.

Management in practice

In practice, the Project Leader used a personal management style for AK1. The distribution of responsibility between the groups in the organization did not change. In the AK1 team, tasks shifted from the Job Preparer to the Project Leader by moving all responsibility to her role. No tasks shift happened in the overarching project. Decision-making is divided over different groups in the organization, this is noticeable in Figure 8, where communication with contractors or the client happens in three places in the organization. Operational decision-making is therefore also divided over the organization, because on site the contractors and client were present and influenced the process. Overall decision-making is happening from the top-down and on site by small changes made by the client and communicated to the AK1 team. The AK1 team had to respond to the changes. They met one day a week and made decisions within the

team. Confusion arose about responsibility between team members from the AK1 team and outside. Therefore, the IPL is often needed for decision-making and the Construction Coordinator coordinated external contractors without informing the AK1 team. Complications arose on the building site when external contractors adjusted their planning without a notice to the AK1 team. The AK1 team had to adjust their planning to the external contractor.

Opinion interviewee on IPM model

The interviewee never worked with the IPM model but thinks it would not be an improvement for this project. In the IPM model, more meetings are needed because of the responsibility division. This is an advantage in a project with many uncertainties, but not in projects where the scope is well-defined. When implementing the IPM model into the organization the individual projects and manager have to be taken into account. A strict approach is not favorable.

4.2.2 Case 2: Kop Weespertrekvaart

Case introduction

Kop Weespertrekvaart (KWT) was a development of a new residential area and part of the overarching Overamstel development project. Project activities include processing soil contamination, preparing the building site for construction, installing and replacing cables and pipelines, and the construction of a small harbor. The site was located in City District East and managed by Project Team East. The project client was G&O. The data for this case were gathered during an interview and from project documents. The project was finished at the moment of the interview.

Project and project performance

Case 2 was a development project where the scope was defined in a general way, and multiple construction tasks had to be executed on site. Before construction started, the scope changed by enlarging the project site. During execution changes were made to the design. The project has a tight schedule with penalties if not met. The location was challenging, because of the number of activities on site. The team always had the possibility of obtaining new resources. Stakeholder management was requested because of the increasing numbers of stakeholders on site. Different activities had to be executed by contractors and external contractors at the same time. The project was delivered on time and within budget.

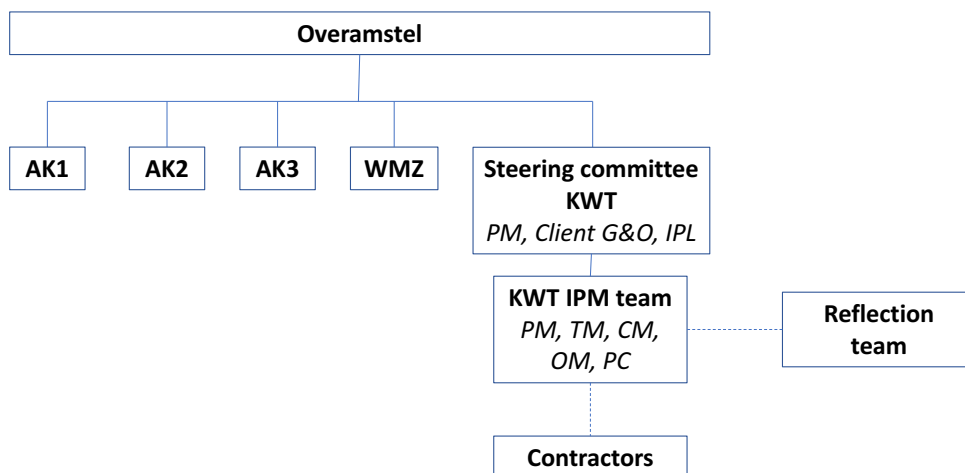


Figure 9 The organization of the Kop Weespertrekvaart sub project with overarching Overamstel project.

Organization and roles

Even though the KWT project was part of the overarching Overamstel project, the project was managed by a separate IPM team (Figure 9). The IPM model was not adjusted and five roles are present. The organization was described in the documentation with the presents of steering committee and the IPM team. The responsibility between the groups was clearly defined in the project documents. The tasks of the five roles in the team are clearly documented.

Management in practice

The project organization and the use of the IPM model are well maintained in practice. Even though, most team members are new to the use of the IPM model, they adopted the way of working. Shifts in responsibility between the groups did not occur. Tasks that were set at the beginning were maintained. Decision-making was divided in the organization, as can be seen in Figure 9. The steering committee makes overall decisions and operational decision-making was done by the IPM team. The distribution between overall and operational management was maintained during the project. No complications arose during execution and the team was awarded the prize for Best Project Team 2015.

Opinion interviewee on IPM model

The IPM model is suited for use in similar projects like Case 2, the interviewee thinks. With the distribution of tasks by the IPM roles, resources can become expert in a certain role. A project must have enough body to provide work for every field of work. Otherwise, roles are combined, and the added value of the mode goes away. In Amsterdam, there are projects with enough body for the IPM model. The use of the model should not be forced on the Project Manager, but the decision should be made in a discussion at the beginning of a project.

4.2.3 Case 3: Weesperplein

Case introduction

Weesperplein was a road maintenance project of a main crossing for pedestrians, bikes, cars, and trams. The site was located in the city center and managed by the city and regional project team. The project client was V&OR. The start of the project was before the merger into one IB at the DIVV project department. The data for the case study were gathered during an interview and from project documents. The project was completed and the team discharged at the time of the interview.

Project and project performance

The scope of Case 3 went from a complex, extensive restructuring of a busy crossroad with a high number of interfaces and uncertainties to a defined maintenance project with a standard contract and contractor. The project stood on its own and did not depend on a tight planning. The site was challenging for managing the traffic flow but did not cause any problems. Resources are widely available. Some political stakeholders needed to be managed during execution. No external contractors from utility companies were present during the process. The project was finished within budget and on time.

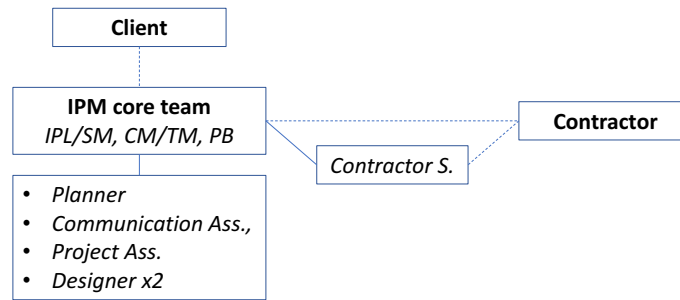


Figure 10 The organization of the Weesperplein project.

Organization and roles

For the management of Case 3 the IPM model was used. The model was adjusted by combining four roles to two team members. The organization was described in the documentation. There was an IPM core team and an outer support team (Figure 10). The IPM core team had all the responsibility and was defined in the documents. All roles are mentioned in the project documentation and their tasks were defined.

Management in practice

In practice, the structure of the IPM core team and external support team were not maintained (Figure 10). During meetings, all team members were present and took part in the discussion for decision-making. Critical team members forced discussions that were unnecessary for the type of project. Task distribution that had been agreed upon changed for reasons of practicality. People from outside the core team were taking on responsibility for planning and communication with the contractor. Overall decision-making, as changes in scope, was up to the client and was outside the project organization.

Opinion interviewee on IPM model

The interviewee thinks the IPM model is right for the project. Partly because she also prefers the way of working the IPM model prescribes. The model only is advantageous when the team members are motivated and want to take responsibility. The distribution of tasks ensures that the project manager has more time to focus on specific parts of the team, but team members must be able to carry the responsibility, otherwise, the model does not work. The IPM model is suitable for larger projects. Small teams with only two people are too small. For the model to work there has to be a separate PC to be critical of the process. The decision for the use of the IPM model should be up to the client and manager.

4.2.4 Case 4: President Allendelaan

Case introduction

The case was a renovation project of two wooden pedestrian bridges crossing the President Allendelaan. The bridges are located in the Sloterpark, City District New West. The project was managed by the Project Team City and Region and the client was Asset Management Department of V&OR. The data for this case were gathered during an interview and from project documents. The project was finished at the time of the interview.

Project and project performance

Case 4 was a defined maintenance project that consists of the same clear task, on two pedestrian bridges. The scope of the project changed slightly before the start, but not drastically. A new contract form was introduced that needed more attention but did not cause any problems. The planning was ample and did not take into account external factors. The location did not cause any problems, and only the detour had

to be revised for local stakeholders. Resources caused no problem during the project. At the beginning of the project stakeholder managements was needed for a revision of the proposed detour. When the detour was adjusted no further stakeholder management was needed in the project. External contractors where not present on site. The project was finished on time, within budget and met the standards of the client.

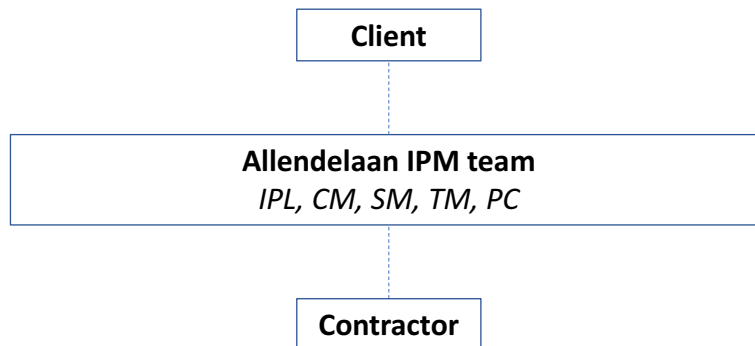


Figure 11 The organization of the Allendelaan project.

Organization and roles

The IPM model was used as basis for the organization and was not adjusted to the project (Figure 11). Project organization and roles are not motioned in the project documentation, but the task allocation was in conformance with the IPM model. The project was on its own and no other groups were present in the organization.

Management in practice

The team used the IPM model, but the task distribution was not implemented in practice. The IPL took on the task of contract design and tender process by himself. Also, special meetings with only the TM, CM, and SM were held, what shows that the team size was adjusted with practicality in mind. The organization did not have multiple groups, so decision-making was centered (Figure 11). The operational decisions were made in a team discussion, even if it was in the meeting with only the TM, CM, and SM. Overall decision-making, as scope changes, was done outside the team by the client. The number of team members cast confusion among the contractor and stakeholders.

Opinion interviewee on IPM model

Projects like Case 4 are typically executed with a smaller team, but possibly with the IPM model setup, says the interviewee. The IPM model provides dynamic management that influenced the project positively. The downside is the risk of isolation of roles, losing cohesion in the team. The IPM model is usable for every project of the IB, but efficiently, merging different functions.

4.2.5 Case 5: OMOP Zuid

Case introduction

OMOP Zuid is an overarching road maintenance program with multiple sub-projects. The sub-projects include replacement of the pavement without changing the layout or design of the street. The OMOP Zuid team is part of Project Team South. The client is City District South. The data of this case were gathered during an interview and from project documents. At the time of the interview, the overall project is not finished, because of the continuous addition of new assignments.

Project and project performance

The scope of Case 5 consists of 15 well defined maintenance projects. No changes were made to the design or during construction. For all projects, the same contractor is used. The projects are straightforward, and the repeating properties ensured a constant improvement process. All projects were combined in an overall planning. Locations were different, but not causing problems. Resources were always available for the team. Stakeholder management is minimally required because no design changes take place and maintenance of the street is valued by the residents. Cable and piping layers were present as external contractors, and had to be coordinated. Projects were finished on time, and the budget met with fixed prices agreed in the contract.

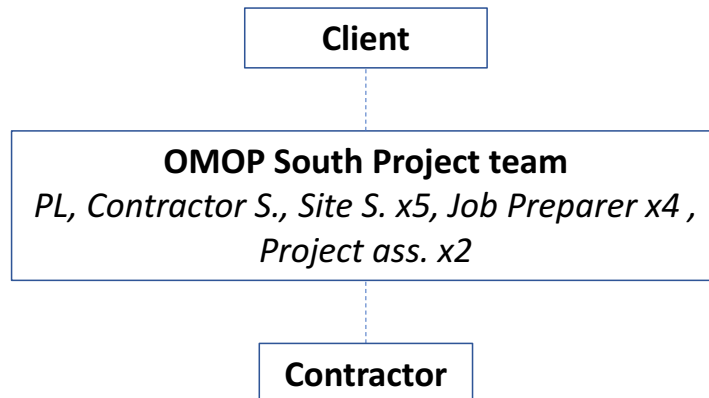


Figure 12 The organization structure of the OMOP South project team.

Organization and roles

In Case 5 the IPM model is not used. Execution of the different sub-projects is done with one group (Figure 12). Roles are mentioned in the documentation, but their tasks were not defined.

Management in practice

No management model is used by the team. The way in which it is managed developed over time. Experience stayed within the team, improving the execution of projects. The organization is a single group with all the responsibilities (Figure 12). Most management tasks were performed by the Project Leader. The tasks related to the execution of the projects were done by the team and divided among resources by mutual agreements. Decisions were made by the client, because of the defined scope. Small operational issues were solved within the project team with the involved people on the work floor. During execution, no complications occurred.

Opinion interviewee on IPM model

The Project Leader thinks there is a usefulness to the IPM model in this type of project, although she prefers the current management method and hesitates to change. The distribution of labor the IPM model offers provides the Project Leader with time to invest in project improvements. She also thinks the team can cope with the responsibility, although the communication will be a challenge. The IPM model is more useful in a large project with uncertainties, than several smaller projects that are straightforward.

4.2.6 Case 6: Kinkerstraat Oost

Case introduction

The Kinkerstraat Oost case was a redesign project of a busy shopping street. The street was used by pedestrians, bikes, cars, and a tram track. The site was located in the City District West and executed by

project team Center and West. The project client was City District West. Data for this case were gathered during an interview. More data were requested in the form of documents but **not** obtained.

Project and project performance

Case 6 was a refurbishment of a busy shopping street, including work on the tram track. The work was well defined and not changed during execution. Before execution the project site was enlarged. To meet the planning, the Project Leader intervened by closing the tram track. The location was small which had to be taken into account with the planning. Resources did not provide problems in the project. Stakeholder management was of great importance, because of the great number of shops. External contractors were present in the form of a cable and pipe laying company, and track workers. The project was delivered on time and within budget.

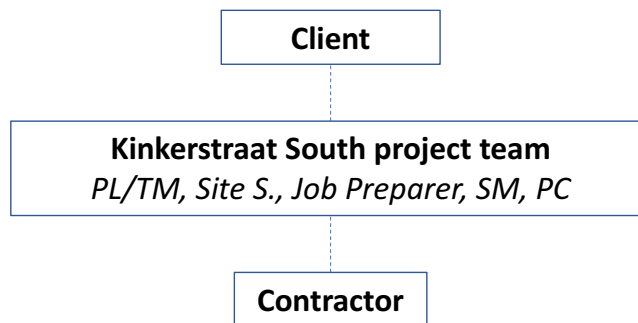


Figure 13 The organization structure of Kinkerstraat Oost project team.

Organization and roles

No management model was used in the project. Therefore, it was assumed that the organization does not consist of different groups and the roles are not mentioned separately (Figure 13).

Management in practice

The Project Leader did not use a management model, but only uses own experience to organize the project. Important are the team members' availability and their expertise. There was one group that had all responsibility over the project (Figure 13). The task distribution was not documented before execution. Decision-making was not distributed over the organization; the whole team was involved. Operational decisions were made by the team. Overall decisions, as scope changes, were made by the client. No managerial complications arose during construction.

Opinion interviewee on IPM model

The IPM model was not of use in this kind of project, says the interviewee. With five roles, the IPM team would be too heavy, and task distribution is not practicable. The IPM only works well in large projects. Projects at street level need a simple model. At the IB for every type of project a different model is preferred.

4.2.7 Case 7: Jan Luijkenstraat

Case introduction

The Jan Luijkenstraat case was a street renovation project. The project includes changing the street design and replacement of the pavement. The street was located in City District South and managed by Project Team South. The project client was City District South. The data for this case were gathered during an interview and from project documents. The project was finished at the moment of the interview.

Project and project performance

The scope of Case 7 was refurbishment of a street. The scope was defined and was not changed. There was no time pressure and delay caused by the external contractor did not matter. There was enough space on site for all activities. The team had sufficient people available during the project. Stakeholders were present and dealt with active management during construction. An external contractor was present in the form of a cable and pipe laying company. Even though the planning was not met, due to an external cause, the budget was sufficient.

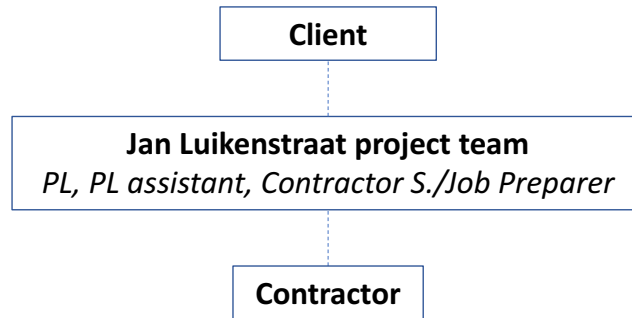


Figure 14 The organization structure of the Jan Luijkenstraat project.

Organization and roles

The project did not use the IPM model. The organization consisted of one group (Figure 14). Different roles were presented in the documentation, but tasks were not specified.

Management in practice

When organizing the team, the Project Manager assessed the project and decided what was needed. Responsibilities were all within one team (Figure 14). In the process of distributing the tasks the Project Manager tried to keep the team as small as possible, but delegated the tasks. Tasks without significant influence on the progress of the project were outsourced outside the group. Tasks distribution in the team was on a practical level, which looked at availability and experience. Decisions were made in the small team where communication was easy. Decisions on scope changes was done by the client. The team did not have complications in management during execution.

Opinion interviewee on IPM model

An IPM team would have made the communication complicated, says the interviewee. As it is the responsibility rested mainly with one person, and he distributed the tasks. With more managers, integration would have suffered. With big projects the IPM model, with proper management, is advantageous. The use of the IPM model should be decided in a dialogue between the municipality and the project manager, taking the project into account.

4.2.8 Case 8: Watergraafsmeer

Case introduction

The Watergraafsmeer is a pilot program where road maintenance and refurbishment projects from a designated area are combined and managed by a full IPM team. With the combination of the projects, an integral approach is used to exploit the advantages of the scale enlargement. New sub-projects will be added to the pilot in the future. The area is located in City District East and managed by Project Team East. Clients of the project are the City District East, Waternet, and Leander. Waternet is responsible for the water piping network from Amsterdam. Whereas Leander is responsible for the power grid in the city.

The data for the case study were gathered by an interview and from project documents. The program started in March 2016, and the first sub-projects were being executed at the time of the interview.

Project and project performance

The scope of Case 8 is the combination of street maintenance and refurbishment projects in a specific area in City District East. It incorporates road and cable and pipe laying activities, making the projects multidisciplinary. The scope of every project is clearly formulated and is unlikely to change. Planning had to be adjusted, due to delays caused by the new organization set-up. Site locations are ordinary and offer enough space for construction. The project as a whole had no problems with resources. Stakeholder management is present at every sub-project. The utility companies usually provide external contractor in projects of the IB, but now their tasks are incorporated in the plan. A combination of projects is put out for tender. The scale increased on multiple construction sites as did the work that needed to be done on site. With the combination of projects a contractor can offer a lower price to execute than executing the projects individually.

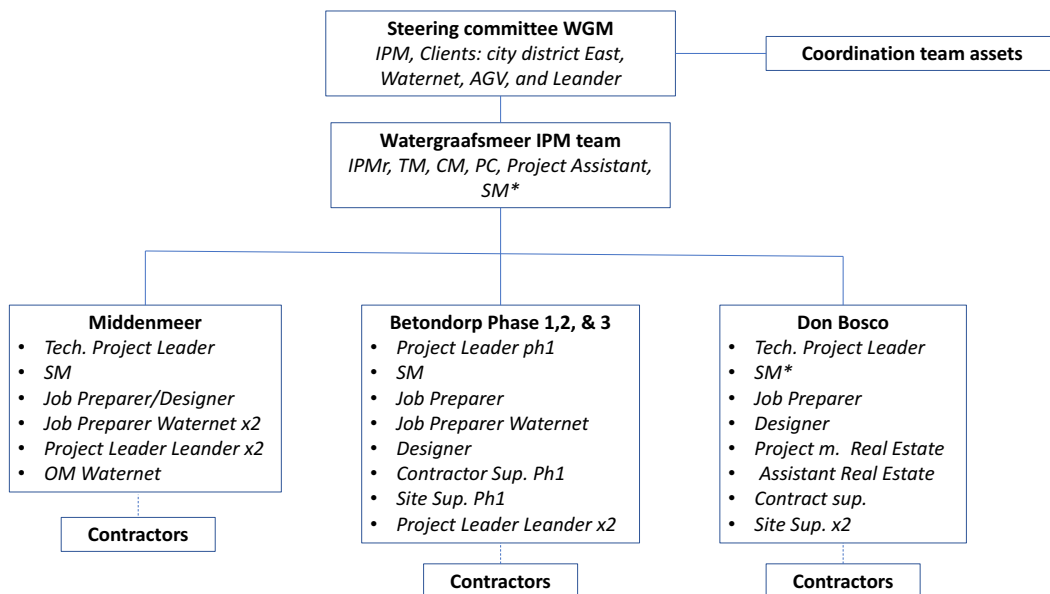


Figure 15 The organization structure of the Watergraafsmeer project with sub-projects Middenmeer, Betondorp, and Don Bosco.

Organization and roles

The IPM model is being used with a full team as the overarching management group, thereby adjusting the IPM model (Figure 15). There are multiple groups present in the organization. These are reflected in the documentation. Their responsibilities are, however, not always defined. The clients are combined into a Steering Committee and communicate directly with the core team. New projects are initiated from the Coordination Team Assets. The responsibility of the Steering Committee and Coordination Team Assets are clear. How the IPM core team and sub-projects managed in practice is not evident in project documents. The same roles are present in different groups, and their tasks and responsibility are not defined.

Management in practice

The task distribution between the IPM team and the sub-teams is not clear yet. The idea is to move all responsibilities to the IPM core team (Figure 15). Task distribution takes place first within the IPM core team with the IPM model in mind. Sub-projects will execute their tasks with a different core team member

for every phase in the lead. His expertise can be used in the straightforward projects, but the set-up demands more communication between the sub-project team and the IPM core team than when a sub-team has some responsibility and can make certain decisions. The IPM manager in the lead delegates the tasks to the sub-team and supports them in the execution. Decision-making is distributed over the organization. The intention is to move all operational decision-making from the sub-teams to the IPM core team, which allows the IPM core team to consider all options. Project Leaders of the sub team find it hard to leave the decision-making to the core team and then have to communicate on practical decision-making on site. A side effect is noticeable that the IPM Core team is actively searching for more work by approaching the Coordination Team Assets and enlarging the project area. The active search for new projects can be a sign of inefficiency of the project team, because the amount of resources in the team is too big for the amount of work that need to be done. Complications are noticeable between the Project Leaders of the sub-teams and the IPM core team on operational decision-making.

Opinion interviewee on IPM model

The IPM model can be adjusted by excluding a specific role, if the project allows it, says the interviewee. A disadvantage of the IPM model is that it can make for an oversized team for the project. Effectiveness would decrease and the organization would become sluggish when compared to a project performed by one or two persons. Merging smaller projects ensures that the entire complexity increases because cohesion has to be found among them. Increasing the complexity of smaller projects by combining allows a full IPM team to operate. The IPM model is good for the IB because of the struggle the organization had on a managerial level. The model gives structure to the projects and people the opportunity to become an expert in a particular field, something that benefits the IB.

4.3 Conclusion

This Chapter presents the analysis of the explorative empirical study into the current practice of applying the IPM model at the IB. The multiple case studies analyzed the project and project performance, project organization and roles, the management in practice, and the opinion of the interviewee on the use of the IPM model. The Chapter provides an answer to the sub-question:

Sub-question 2.: What is the current practice of applying the IPM model in the host organization?

In Case 1 the IPM model is used in the overarching team but not in the project team. The AK₁ project team is organized "bottom-up" according to the experience and preference of the Project Leader. Managerial complications arose with the distributed responsibilities between the overarching and the case team. The project was over time and budget.

In Case 2 the IPM model was used to a full extent. Five team members were present and their roles were clear with the distribution that the model proposes. The project team performed well with the use of the IPM model. The project met the deadlines and was within budget.

In Case 3 the intention was to use a full IPM model. When the scope changed, the team was adjusted by combining IPM roles. The roles and organization are defined in documentation, but were not enforced in practice. Members of the support team were given responsibility and included in decision-making. The size of the team caused managerial implications, because of extended discussions. The project was finished on time and within budget.

In Case 4 a full IPM team was applied. The team had managerial complications within and outside the team. Within the team tasks were carried out individually or in a small group. Outside the team

communication with stakeholders and contractors was unclear. The project itself was finished on time and within budget.

In Case 5 no IPM model was used, but instead a bottom-up approach taking the sub-projects and resources into account. The organization consisted of one large team with one manager at the top. The organization was adjusted, because of changing sub-projects and resources. No managerial complications were noticed and projects were finished on time and within budget.

Case 6 was managed without the IPM model. The group was organized by the Project Leader bottom up, with the project and resources in mind, keeping the team as small as possible for communication and decision-making. Some individual tasks were executed by external resources. No managerial complications were mentioned. The project was finished on time and within budget.

In Case 7 the IPM model has not been used. The organization was created with the project and resources in mind, bottom-up, keeping the team as small as possible to minimize communication. Task distribution was practical and decision-making fast and wherever possible on site. No managerial complications were noticed. The projects endured a delay because of an external contractor. The project budget was met.

In Case 8 the IPM model is being used in the overarching core team. At the top of the organization roles and responsibilities are defined. Communication with the three clients is organized in one group. Decision-making within the sub-projects is done in the IPM core team. Because Case 8 is still being realized, it is not possible to properly describe their performance. The planning has been revised, because resources have to get used to the new model. Also, said by the interviewee, the sub-project leaders find it difficult to leave the decisions to the IPM core team.

Comparisons between the eight cases will be made with a cross-case analysis in the Chapter 5. The cross-case analysis indicates discriminating differences between cases that use the same management methodology.

5 Cross-case analysis

The empirical data gathered in the eight case studies described in Chapter 4 will be used in a cross-case analysis. The cross-case analysis shows similarities and differences between the results of the cases (Yin, 2013). The findings will provide a more solid and generalizable answer than individual case studies. The cross-case analysis is performed to answer the following research questions:

Sub-question 3: Are adjustments needed to the IPM model for the projects of the host organization?

Sub-question 4: Which adjustments may be made to the IPM model?

The goal of this Chapter is to present the cross-case analysis and use the findings to answer sub-questions 3 and 4 by:

- In Section 5.1 the characteristics of the projects are compared.
- In Section 5.2 the cases are compared on their application of the management methodology.
- In Section 5.3 a theoretical explanation is given on management structures that are fit for a project.
- Section 5.4 evaluates the application of the IPM model.
- Section 5.5 formulates a suggested adjustment to the IPM model for projects of the host organization.
- In Section 5.7 a conclusion is given that provides an answer to sub-questions 3 and 4.

5.1 Comparing projects characteristics

For the cross-case analysis, the projects of the eight cases have to be compared. From the TOE framework as developed by Bosch-Rekvelde et al. (2011), 16 questions are selected for the questionnaire to gather the projects' characteristics. With the characteristics, the complexity of the projects is assessed. The complexity is measured by means of a scoring model. In Appendix E, the eight cases are compared on 12 points. A project can score 0.0 or 0.5 or 1.0 point for each characteristic. The score for each characteristic:

- 1. Score 0.0 with one client, score 1.0 with two or more clients.
- 2. The case with the largest budget is € 6.9 million (Case 5). Dividing € 6.9 million in 3 equal parts of € 2.3 million.
 - Budgets of € 2.3 million or lower, score 0.0.
 - Budgets of € 2.4 million up to and including € 4.6 million, score 0.5.
 - Budgets of € 4.7 million and up, score 1.0.
- 3. The types of assignment are ranked on permit applications and public participation.
 - Maintenance projects score 0.0
 - Refurbishment projects score 0.5.
 - Development projects score 1.0.
- 4. Scope not defined to final design at the start of the project scores 1.0. If not, the score is 0.0.
- 5. The project is multidisciplinary, score 1.0. If not the score is 0.0.
- 6. The scope of the project changed before execution, score 1.0. If not the score is 0.0.
- 7. The scope of the project changed during execution, score 1.0. If not the score is 0.0.
- 8. The planning of the project was of great importance to the process, score 1.0. If not the score is 0.0.
- 9. The location of the project was of high influence on the process, score 1.0. If not the score is 0.0.
- 10. The project did have difficulties obtaining resources, score 1.0. If not the score is 0.0.

- 11. The project needed active stakeholder management, score 1.0. If not the score is 0.0.
- 12. The project depended on external contractors, score 1.0. If not the score is 0.0.

Table 3 The score of a project on each character, green (0), yellow (0,5), or red (1).

# Question	Case								
	1	2	3	4	5	6	7	8	
1 Number of clients	1	1	1	1	1	1	1	3	
2 Budget (mil. euro)	?	5	2	2,2	6,9	2	0,5	6,5	
3 Type of Assignment?	Dev.	Dev.	Main.	Main.	Main.	Ref.	Ref.	Main./Ref.	
4 Scope defined to final design at start?	no	no	yes	yes	yes	yes	yes	yes	
5 The project is multidisciplinary?	yes	yes	no	no	no	no	no	yes	
6 Scope changes before execution?	yes	yes	yes	yes/no	no	no	no	no	
7 Scope change during execution?	yes	yes	no	no	no	no	no	no	
8 Planning of importance?	yes	yes	no	no	no	yes	no	no	
9 Location of influence?	yes	yes	yes	no	no	yes	no	no	
10 Difficulties obtaining resources?	no	no	no	no	no	no	no	no	
11 Active stakeholder management?	yes	yes	yes	no	no	yes	yes	yes	
12 Dependent of external contractors?	yes	yes	no	no	yes	yes	yes	no	
Total		9,5	10	3	0,5	2	4,5	2,5	4,5

The table shows that the two development projects of G&O with a score of 9,5 and 10 are relatively highly complex compared to the other projects. The projects were subject to changes before and during the execution. Both cases had important deadlines and a building site with multiple activities and stakeholders present. Cases 6 (score 4,5) and 8 (score 4,5) were moderately complex, Case 6 because of the location of the building site and the high number of local stakeholders' present. Case 8 is a combination of relatively low complex sub-projects. Combining 3 clients and creating cohesion among the sub-projects is more complex compared to the other projects. Cases 3 – 5 and 7 have a low complexity compared to the other projects.

5.2 Comparing the management methodology

The data from the eight cases in Chapter 4 is the basis of the cross-case analysis. An extensive comparison of all the data is included in Appendix E. With the findings from Appendix E a general comparison is made in Table 4 on eight points:

- Table 4 presents three types of clients: Grond & Ontwikkeling (G&O), Verkeer & Openbare ruimte (V&OR), and city districts (C.D). (1)
- The budgets of the eight cases range from k€ 500 to M€ 6.9 (2).
- The types of assignments are: Development (Dev.), Maintenance (Main.), and Refurbishment (Ref.). (3)
- Cases are compared with each other to describe their relative complexity in Section 5.1. The complexity ranges from 1 to 12. (4)
- The use of the IPM model as described in the previous chapter and whether the model is used in a full, adjusted, or overarching manner. (5)
- From the case study the complications during execution is mentioned. (6)
- The project performance is included in terms of compliance with schedule (7) and budget (8).

Table 4 The cross-case analysis on type of project, the use of the IPM model, and their performance.

# Question	Case							
	1	2	3	4	5	6	7	8
1 Client	G&O	G&O	V&OR	V&OR	C.D.	C.D.	C.D.	C.D.*
2 Budget (mil. euro)	?	5,00	2,00	2,20	6,90	2,00	0,50	6,50
3 Type of Assignment?	Dev.	Dev.	Main.	Main.	Main.	Ref.	Ref.	Main./Ref.
4 Complexity (1-12)	9,5	10	3	0,5	2	4,5	2,5	4,5
5 Use of IPM model	Overarch	Full IPM	Comb.	Full IPM	no	no	no	Overarch
6 Managerial complications?	yes	no	yes/no	yes/no	no	no	no	yes/no
7 Project finished on time?	no	yes	yes	yes	yes	yes	no	no
8 Within budget?	no	yes	yes	yes	yes	yes	yes	?

* external client: Waternet and Leander

The cases are compared on the basis how the IPM model was (or, as in Case 8, is being) applied:

- The IPM model in an overarching team
- The IPM model without adjustments
- The IPM model with adjustments
- No IPM model

5.2.1 IPM model in overarching team

Case 1 and Case 8 both use the IPM model in an overarching core team and manage several sub-projects. Case 1 is a development sub-project with a high complexity, whereas Case 8 is multiple low complexity maintenance and refurbishment project. The combination of several sub-projects and a combined budget of M€ 6,5 in Case 8 makes it overall a medium complex case

The use of the IPM model as overarching core team and managing Case 1 indirectly is causing managerial complications. Decision making is distributed over the organization between the overarching IPM team and project team of Case 1. The unclear decision-making is causing communication problems as well as problems with the decision-making itself. In Case 8 the IPM core team functions well in their overarching tasks, because the IPM team creates opportunities in combining clients and cohesion among the sub-projects. How the sub-projects themselves are executed in practice is still unclear. The distribution of tasks between the IPM core team and sub-projects is not defined yet. It is Proposed to make decisions in the IPM core team, but this would demand more communication in the project team.

Case 1 is underperforming on cost and planning (Section 4.2.1). Deadlines are moved forward due to changes in the design and the budget is unknown. Although Case 8 is still being executed, the planning has been revised due to start-up problems with the new way of using the IPM model (Section 4.2.8).

5.2.2 IPM model without adjustments

Cases 2 and 4 use the IPM model without adjustments. Case 2 is a development project with a high complexity and a budget of M€ 5, whereas Case 4 is a maintenance project with a low complexity and a budget of M€ 2.2.

The management structure of Case 2 is well described and the IPM roles were maintained during the execution. Using the IPM model, integrated decisions were made by the team without managerial complications. In Case 4 the IPM roles were distributed among the 5 members, but these do not provide enough work for the team. Members work on their own, or in a small group on individual tasks, causing islands to form in the team. Managerial complications resulted in unclear communication between the team and contractor or stakeholder.

Even though Case 2 incurred various changes of scope, the project has performed well (Section 4.2.2). The project has kept to the deadlines and within budget. Case 4 also met planning and budget targets, but the managerial complications affected the efficiency within the team (Section 4.2.4). The amount of resources in the team was too great for the amount of work that had to be done.

5.2.3 Adjusted IPM model

At first Case 3 was more complex, but later it shifted to a low complexity maintenance project. The project team adjusted the IPM model to the scope change of the project, combining four roles of the IPM model on two team members.

At the start of the project the combined IPM team would make all the decisions, but in practice decisions were made in co-operation with the support-team. The system where the 3 team members were informed by the support team and made a considered decision did not work. The large team forced discussions for a relatively low complex project, affecting the efficiency of executing the project.

Case 3 was finished within budget and on time. The management team was lacking in their performance of efficiency because of the size of the project team (Section 4.2.3). The size of the project team forced decision-making to be done in extensive discussions. These discussions were often unnecessary for a low complex project which had a designated contractor at the start.

5.2.4 No IPM model

Cases 5, 6, and 7 did not use the IPM model but were managed with a "bottom-up" approach with the experience of the Project Manager. Case 5 combined several low complexity maintenance projects. Cases 6 and 7 were both refurbishment projects. Case 6 had a medium complexity, whereas Case 7 had a low complexity.

The Project Manager assessed the project and distributed the tasks according to the experience and availability of the resources. Management of the 3 cases was done with practicality in mind. The managers responded to internal and external changes by distributing tasks among team members. Tasks that could be done without overall consensus of the project team could be performed by resources outside the team. The project team itself stayed as small as possible, minimizing communication problems and managerial complications.

Case 5 and 6 performed well by staying within budget and keeping to their planning (Section 4.2.5 & 4.2.6). Case 7 incurred a delay caused by an external factor (Section 4.2.7). Managerial performance of the teams was sufficient to the need of their projects.

5.3 Theoretical reflection

In this Section literature is reviewed to formulate a scientific view on the phenomenon of copying the IPM model into the projects of the IB.

- First, the contingency theory as a "school of thought" (Söderlund, 2011) in project management will be discussed.
- Second, a scientific opinion of a "one size fits all" management standard will be explained.
- Finally, a review will be done of the literature on management of small projects.

5.3.1 Contingency theory in project management

The contingency theory has been an element of organizational theory since the 1950's, but research in applying the theory in project management is of a later date (Shenhar & Dvir, 1996). It originates from the thought that project management is a problem-driven discipline and aims to adapting management to project (Shenhar & Dvir, 2007). The contingency theory explains that projects with different context factors need another way of management. If the projects differ in terms of the amount of changes, the project objectives and the environment and the complexity of the technology used, they need a different organizational structure and management. The theory develops the thought that there is no single best way of managing and organizing (Burns & Stalker, 1961; Lawrence & Lorsch, 1967; Woodward, 1958, 1965).

The contingency theory is a static structure which in first essence contradicts the idea of organizational change and adaptation (Galunic & Eisenhardt, 1994). The static model deals with the relation to "fit" the type of organizational structure on a project for high performance (Woodward, 1965). However, organizations adapt to their changing environments by changing in form, thereby moving from one fit to another over time (Parsons, 1961). This process of adjusting the structure to fit the organization for higher performance is described in a theoretical model of Structural Adaptation to Regain Fit (SARFIT) (Donaldson, 1987, 2001). An organization in fit executes project most efficiently, resulting a surplus of resources allowing the organization to expand and take on more projects (Hamilton & Shergill, 1992).

The contingency theory defined to extremes in the spectrum of organization structures, a mechanistic organization structure and an organic organization structure (Burns & Stalker, 1961). In a mechanistic organization, roles are clear and the gathering of organizational knowledge and making decisions- is done by superiors. In an organic organization structure the roles are loosely defined and knowledge is gathered among the experts in the organization (Donaldson, 1999). Decisions are made during discussions between staff. Over the years research has been performed and contingency factors have been presented that affect the performance of an organization. The contingency factors which are the most important to be considered when choosing organizations structure are (Donaldson, 1999):

- The rate of change of the environment, goals and technology (Burns & Stalker, 1961; Lawrence & Lorsch, 1967).
- The complexity of technology used by the organization (Woodward, 1965).
- Task uncertainty caused by the environment (Galbraith, 1973; Thompson, 1967).
- The size of the organization as contingency factor on structuring, as an organization becomes larger they are more structured (Pugh, Hickson, Hinings, & Turner, 1968).

5.3.2 A view on project management standard

Using a standard project management methodology for all projects of an organization or even the same methodology for different project organizations, is in contradiction with the contingency theory. Every project, and moreover every project organization, has different context factors that, according to the contingency theory, need an organizational fit.

Power-knowledge regimes, such as PMBOK, are the idealization of a standard (Bowker & Star, 2000). They embody goals of practice and productions that are never fully realized. The development of a "one size fits all" approach for project management in the BOK is also criticized (Morris et al., 2006). The management standard restrains the judgement of the project manager on executing projects in their individual context. The practitioners should make their own decisions on the use of the principles, concepts, models and techniques tailored to the needs of the project.

5.3.3 Management of small projects

In project management research there is a focus on large engineering and construction projects (Turner, Ledwith, & Kelly, 2010). Research in medium-sized projects is slowly increasing, but little is written about the management of the small projects. In a search for literature on management of small projects, articles are found on the management of Small to Medium-sized Enterprises (SME) (Barrett & Sexton, 2006; Payne & Turner, 1999; Turner, Ledwith, & Kelly, 2009; Turner et al., 2010). This literature is reviewed here to formulate a view on management of a small project.

The smaller the organization the smaller the projects they execute (Turner et al., 2009). Studies show that in a company a tailored approach of procedures to the size of the project and type of resources is advantageous (Payne & Turner, 1999). A standard approach can be adopted by project planning and control at the integrative and strategic level, but there need to be room for tailoring the procedures to the needs of individual projects at the day-to day operational level. Small to medium sized multi-project organizations need a "lite" version of project management (Turner et al., 2010). The level of bureaucracy increases with the size of the organization. Small multi-project organizations are people focused and support their sense of family. The use of specialists in medium sized multi-project organizations is higher and requires more formal coordination, but still to a lesser extent in comparison to large organizations. Project management at small organizations is performed by "amateurs" and is not their first responsibility (Turner, Ledwith, & Kelly, 2012). For project managers in a SME a simplified version of project management is preferred, with a focus on requirements definition, and practices for managing the work, duration and resources.

5.4 Evaluation of the IPM model

Case 8 is still being executed and the management structure is subject to change, therefore the case is not used as input for evaluation of the IPM model in this Section. Case 8 will be used to formulate managerial implications for using the IPM model on multiple projects in Chapter 6.

In Chapter 1 the origin of the IPM model was described as the combination of the 7 processes present in every RWS construction project including the PMW management methodology. To apply this in practice, the model prescribes 5 roles and the interaction with each other ensures that there is co-operation as PMW prescribes. The roles are the combination of tasks of that particular IPM process. The IPM model is applied "top-down" without taking the project or the available resources into account.



Figure 16 The IPM model applied "top-down".

Cases 2, 5, 6, and 7 perform well with their management methodology (Table 4). Case 2 is managed by a centered IPM team, choosing resources for the roles, whereas Cases 5, 6, and 7 are managed "bottom-up" by distributing the tasks by taking the availability and expertise of the resources in mind. Cases 1, 3, and 4 had managerial complications. In Case 1 the overarching IPM team is not adequate to actively manage the development project. Case 3 adjusted the IPM model, but still did not fit for the maintenance project. In Case 4 the maintenance project did not provide enough work for the full IPM team.

For Case 1 the distant management from the overarching IPM team did not provide the structure needed (Section 5.2.1). The complexity of the project needed a more centered management. Case 1 shows similarities with Case 2 where the IPM model is placed in the center and is not adjusted (Section 5.2.2). For Case 1 the IPM model should not be adjusted if applied.

Case 3 used an adjusted version of the IPM model, but still applied it “top-down” (Section 5.2.3). The task distribution in the IPM core team proved not to be adequate to execute the project, resources from the support team were asked to attend all the meetings. Decisions could not be made without input from the support team, resulting in meetings with a large group of resources. During the meetings, unnecessary discussions took place, affecting the efficiency of the project. Case 4 uses the IPM model without adjustments with the “top-down” approach (Section 5.2.2). The 5 team members all have a task, but the cohesion between the team members was lacking. Missing cooperation in the team was shown by members who were working on their own, or in a small group, causing managerial complications in communication. The project of Case 4 did not provide enough work for the 5 team members. In both cases the roles of the IPM model are used as starting point for distributing the tasks, visualized in Figure 16. Even with the combining of the roles in Case 3, there is little room for practical adjustments to the need of the project. The IPM model should be adjusted by changing the “top-down” approach of static task distribution by the five IPM roles.

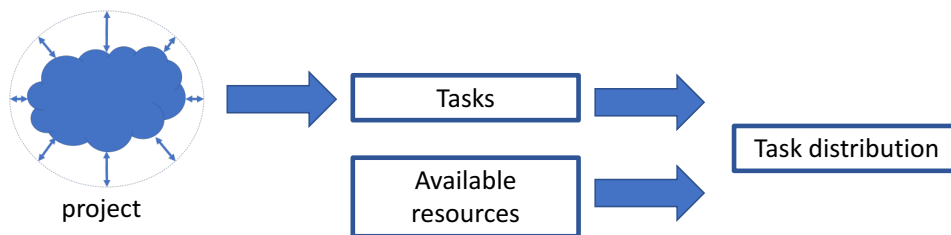


Figure 17 “Bottom-up” approach by Cases 5, 6, and 7.

The Cases 5, 6, and 7 were managed in a manner where the Project Manager had the opportunity to implement practical changes to the task distribution (Section 5.2.4). The management structure shows similarities to the management of small projects in the previous Section where an approach to procedures tailored to the size of the project and type of resources is shown to be advantageous. In Cases 5, 6, and 7 the Project Manager assessed the project and distributed the tasks with the availability and experience of the resources in mind, visualized in Figure 17, keeping the management structure as simple as possible. The IPM model should be adjusted to allow the “bottom-up” approach used in Cases 5, 6, and 7.

5.5 Adjusting the IPM model

Based on the cross-case analysis the following adjustment to the IPM model is proposed for single smaller less complex projects of the IB. The “original” IPM model has a “top-down” task distribution clustered around the 5 roles. It is recommended to allow a more “bottom-up” task distribution. The 5 roles were derived from the 7 processes and the PMW management methodology (Section 1.2). To what degree each process is present in one of the 3 phases differs per project and can change during execution. As visualized in Figure 18, the Project Manager has the task of assessing the project and making sure that all of the 7 processes are controlled. The 7 processes are managed by formulating tasks for every process. The available resources with their expertise are given certain tasks. Task distribution can happen within and outside the team. Not every task does have to be executed by a team member. By outsourcing individual tasks, the project team can stay small and minimize essential communication.

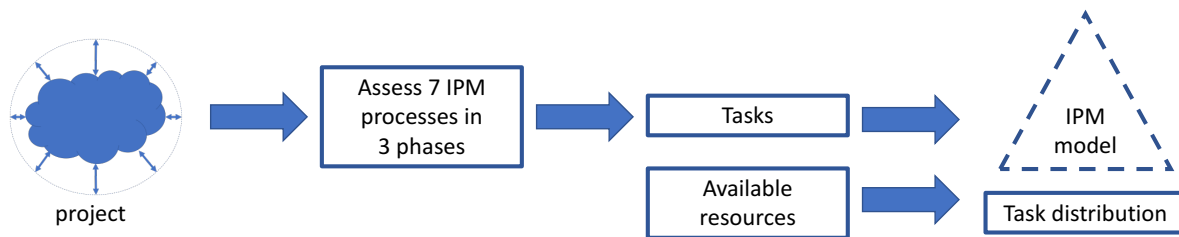


Figure 18 Adjustments to the IPM model for "bottom-up" approach.

The number of team members can differ per project, with a minimum of two. The management style within the project team is the same as in the original IPM team. The project-processes of the PMW are used. To create interaction within the team, the tasks have to be distributed in such a way that active co-operation among the members is needed. Tasks that have contradicting interests are to be allocated to different team members. With a team of two people, the distribution can be made by assigning the tasks of project management, project control, market, and political stakeholders to one person, technical requirements and design, conditioning and local stakeholders to the other team member. The team members have to communicate and look at all the options before a decision can be made. The tasks that the Project Manager formulated are refined to the detail of a daily task. The workflow in the team is known to all members. Political and public stakeholders are acknowledged in every project and a plan is formulated to take their interests into account. The decision-making process on project scope is managed by the Project Manager and supported by the project team.

The proposed changes to the IPM model leave much room for a free interpretation by the project manager. It is not the intention that with the free distribution of tasks all are carried out by one person. A team has to be created, and tasks are distributed so that co-operation is needed to carry out the project.

5.6 Deciding between "top-down" or "bottom-up"

For the proposed adjustment to work in practice, a considered decision has to be made at the start of a project between the "bottom-up" or "top-down" approach (Figure 19). From the comparison of the eight projects in Table 3 there is a division between Cases 1 and 2 where it is recommended to use the IPM model "top-down" and Cases 3 to 7 where the "bottom-up" version of the IPM model is recommended. From the project characteristics, the following points recommend a "top-down" approach:

- A development project, or
- A single project with a budget of € 5 million or more, or
- There is sufficient work for all five IPM roles

The proposed points are based on only eight projects. It is recommended that more internal research is done to add and refine the points.

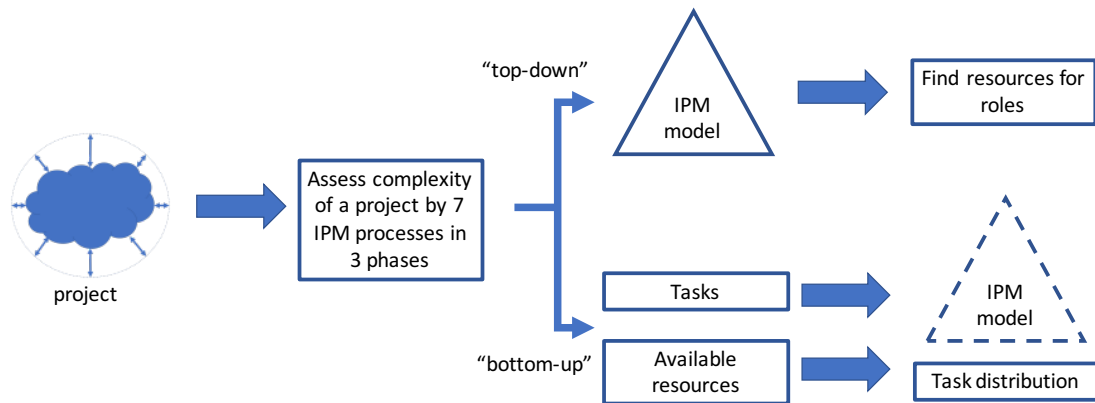


Figure 19 Decision tree to choose between "top-down" or "bottom-up" approach of the IPM model

5.7 Conclusion

Sub-question 3.: Are adjustments needed to the IPM model for the projects of the host organization?

Yes, it is recommended to adjust the IPM model for a group of projects of the host organization.

- The "top-down" task distribution of the "original" IPM model does not fit the smaller less complex projects of the IB. It constrains the Project Manager to make practical changes in the project team needed for efficient management.
- In addition, there are projects that do not use the IPM model at the IB. These cases use a "bottom-up" approach by assessing the project and distributing the tasks among the available resources. The IPM model does not provide the possibility for a "bottom-up" approach.

Sub-question 4: Which adjustments may be made to the IPM model?

The recommended adjustment to the IPM model for smaller, less complex projects at the IB is to change from a "top-down" approach to a "bottom-up" approach. With the "bottom-up" approach the project is assessed on the 7 IPM-processes. From the 7 defined processes, daily tasks are formulated. The tasks are distributed among the available resources at the IB, with a minimum of 2 team members. Management within the project team uses the same PMW management methodology, consciously distributing tasks in such a way that there has to be active cooperation in the teams.

6 Managerial implications

The IPM model itself can be modified, or smaller projects can be grouped together to increase the substance and complexity of the total project, so it can be executed by the “original” IPM model. Case 8 is a new way of using the IPM in an overarching team managing several smaller projects (Section 4.3). The cross-case analysis in Chapter 5 did not include Case 8, because it was in the process of being executed at the moment of the study. Managerial implications defined in this Chapter are based on Case 8 and provide an advice for the IB that can be used in further implementation of the IPM model. This Chapter has two parts:

- In Section 6.1 the use of the IPM model in an overarching form is discussed.
- Section 6.2 explains how the “top-down” and “bottom-up” approach can be combined and improve the overarching IPM form.

6.1 Overarching IPM model

Case 1 and Case 8 use the IPM model in their overarching management team. The use of the IPM model to steer several more complex projects did not provide the direct management needed in Case 1 (Section 5.2.1). Case 8 on the other hand has projects with a relatively low complexity with fewer mutual connections, providing the possibility for a more distant management structure. At the time of the study Case 8 was still being executed and was still searching for the right way of applying the IPM model in an overarching form.

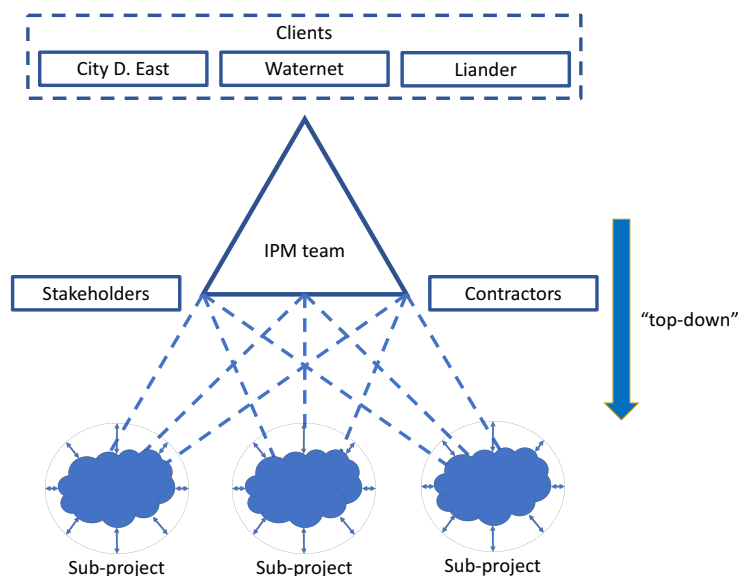


Figure 20 Multiple projects managed on both operational and overall level with a “top-down” approach by an overarching IPM team.

Figure 20, visualizes the structure of Case 8. At the top of the triangle the IPM team is the communication link with the three clients is depicted. Together with the clients the scope is set of the multidisciplinary sub-projects and include multiple sites. The combinations of sub-projects enable the contractors to offer a better price than individual assignments. Also, a side effect is that IPM team is actively searching for work by asking the clients and helping them to formulate new projects, thereby performing a form of project portfolio management for the area they are operating in.

With the “top-down” approach, a team of 5 IPM roles is in the lead in managing and decision-making (Section 4.3). For every phase of sub-project a core team member comes to the sub-team to distribute

tasks and collect information. Back in the IPM core team the information is discussed and with the use of the IPM model a decision is made. The segregated “top-down” approach of the core team makes it hard to create a cohesive and effective sub-team. Also, it is hard to adjust the management structure to the needs of the sub-project and available resources, that is recommended for low complex projects at the IB (Section 5.5).

The decision-making in the overarching team could cause problems as in Case 1. The flow of information to the IPM core team can become extensive if no distinction is made between sub-project or overarching decisions. The amount of communication can eventually affect the execution of the sub-projects in practice. With this organization, several sub-projects depend on the well-functioning of IPM core team. If the IPM core team is not functioning correctly for various reasons, it may affect all sub-projects.

6.2 Combining “top-down” and “bottom-up”

In the literature on management of small projects in Section 5.3.3 a distinction is made between project planning and control at an integrative and strategy level on the one hand, and a tailored approach on an operational level (Figure 21) on the other. The distinction offers the possibility to combine the advantages of a “top-down” approach in the IPM core team and a “bottom-up” approach in the sub-projects, as visualized in Figure 21.

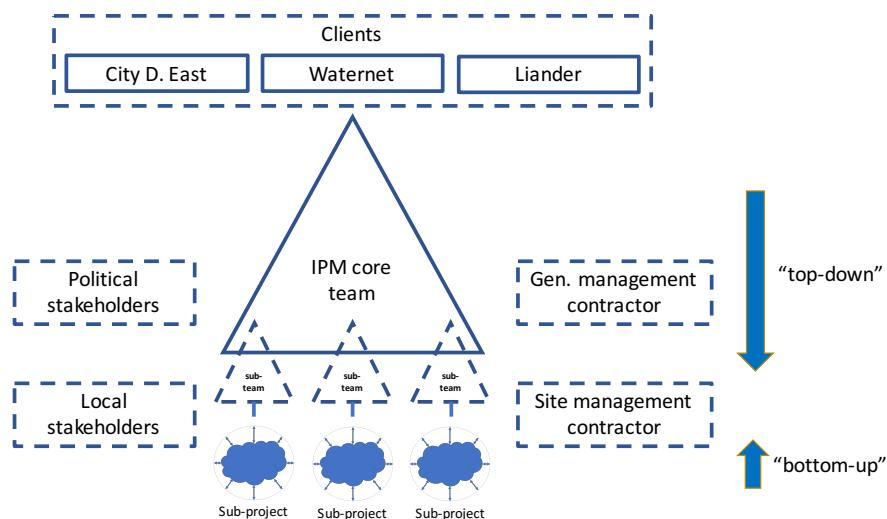


Figure 21 Multiple sub-projects managed at overall level by a “top-down” IPM team and on operational level by a “bottom-up” sub-team.

In the combined model the IPM core team is still leading in every sub-project. The core team takes on the overarching tasks and leaves the sub-project specific tasks to the sub-team with a sub-team manager. In the sub-teams the “bottom-up” approach is applied (Section 5.5). The sub-project is assessed on the 7 IPM processes and the tasks that are specifically needed are distributed among the available resources. In this process, several tasks are already executed by the IPM core team. For example, a contractor is selected and the scope of the project is set with the clients. The sub-project specific tasks that still need to be done are distributed among the small team that is formed. It may well be that the selected resources are also active in the IPM core team or other sub-teams, executing different tasks.

Operational day-to-day decision-making can be done in the sub-teams. Small matters on site, such as problems with a local stakeholder or a contractor’s site manager, can be resolved by the sub-team without involvement of the IPM core team, minimizing dependency of the IPM core team for day-to-day execution (Figure 21). When a decision has an overarching character, or it is changing the scope of the project, the

sub-team manager, as linking pin, informs the core team. In the core team the 5 IPM roles can make a well-considered integral decision.

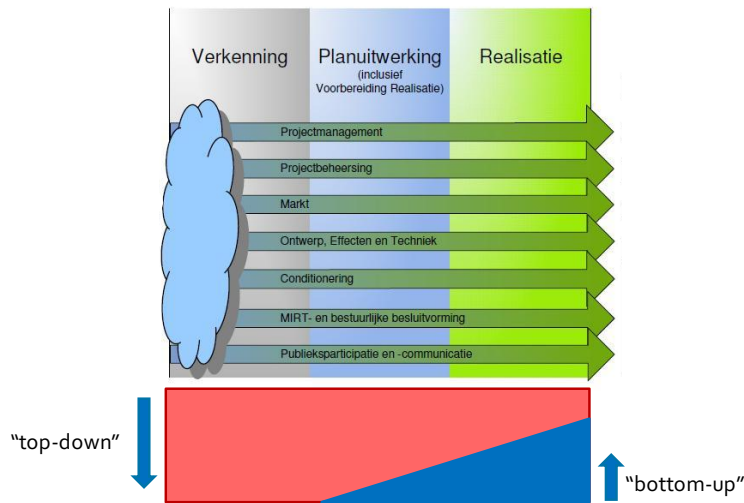


Figure 22 In the front end phases the tasks are executed from the IPM team, during execution specific sub-project tasks are moved to the sub-team.

In practice, the following steps are recommended to will be taken by the IPM core team and sub-team, visualized in Figure 22:

- During the exploration phase, the IPM core team negotiates with the clients on new sub-projects for the area they are responsible for. The interests of the 3 clients (city district, Waternet and Leander) can be taken into account when initiating a new plan. The IPM core team has an overview of the ongoing sub-projects and can create cohesion with the new proposed sub-project.
- In the plan development phase, the IPM core team works on an overall plan. With the 5 roles, all aspects of the new construction project are taken into account. During the plan development phase the first tasks are executed by sub-teams. The tasks are the same for every sub-project but can be executed individually, for example mapping local stakeholders and conditioning of the building sites. The sub-teams that are created start to gather insight in sub-projects which is of interest in the execution phase. The detailed insights are of less importance to the overarching IPM team which has the responsibility to maintain the cohesion among the sub-projects. The plan development phase formulates a defined project plan and the entire plan is put out for tender. A contractor is selected which is going to execute the multiple sub-projects.
- During the execution phase, the sub-team is actively involved in managing the sub-project. The sub-projects are defined and because of their small size and low complexity, the amount of changes to the design during execution is low. Problems that occur with local stakeholders or the contractor's site manager can be resolved by the sub-team. When changes have to be made which influence other sub-projects or change the scope of the sub-project, the IPM team is involved. The overarching team can see how the changes impact the other sub-projects and make a well-considered decision to resolve the matter.

7 Conclusion and recommendations

This Chapter will give the conclusions of the study performed and discuss the method and the results to put them in context. The conclusions are formulated by incorporating the findings made in the previous Chapters and answering the main research question:

Which adjustments should be made to the IPM model to make it suitable for projects of the host organization?

The Chapter is structured the following way:

- In Section 7.1, the conclusions of the study are presented by first summarizing the answers to the sub-questions and answering the main research question.
- Section 7.2 presents the discussion on the performed study.
- In Section 7.3, recommendations for further research are made.
- In Section 7.4, practical recommendations for the IB are presented.

7.1 Conclusion

What is the current status of the IPM model in the host organization?

It was not clear what the current status of the IPM model was in the host organization. After the merger in 2014 general management of the IB opted for a soft so-called “oil-stain” approach to introduce the IPM model. Project Managers are free to use the management standard but are not obliged to. To further develop the IPM model for the IB projects the IPMkernteam was created. The IPMkernteam works on development, but on a voluntary basis, making for relatively slow progress. Additionally, there is no general project portfolio management at the host organization, making it hard to have an overview of the on-going and finished projects. From the exploratory interviews, it emerged that the larger, more complex IB projects the IPM model is an adequate management structure. When projects become smaller and less complex, the use of the IPM model is unclear. The management structure is not always used and the way of applying differs for each project.

What is the current practice of applying the IPM model in the host organization?

When studying eight projects in a multi-case analysis, the IPM model is used in various ways:

- Case 1: the IPM model is used in the overarching team, but not in the project team
- Case 2: the IPM model is used to the full extent.
- Case 3: the intention was to use a full IPM model. When the scope changed, the team was adjusted by combining IPM roles.
- Case 4: a full IPM model was applied.
- Case 5: no IPM model was used.
- Case 6: no IPM model was used.
- Case 7: no IPM model was used.
- Case 8: the IPM model is used in the overarching core team.

Are adjustments needed to the IPM model for the projects of the host organization?

When comparing the eight cases with each other, it is noticeable that the use of the IPM model is not beneficial in all projects. The “top-down” approach for the task distribution that is suggested by the five roles does not fit the smaller less complex projects of the IB. The roles constrain the project manager from making practical changes to the task distribution to take the available resources into account. Also, there are projects that do not use the IPM model but still perform well. In the projects, a “bottom-up” approach is used to manage and structure the team. The project manager assesses the project and with the available

resources in mind distributes the tasks. The IPM model should be adjusted to be applicable for the smaller, less complex IB projects.

Which adjustments may be made to the IPM model?

For single, small, low complex projects the “original” IPM model should be adjusted. The basis of the IPM model is the 7 processes that are present in every project. In the normal course of events the 5 roles of the IPM model are formulated together with the PMW management methodology. The 5 roles are applied “top-down” to ensure that both the 7 processes and the PMW methodology are used in a project. In the case of small, less complex projects the “top-down” approach has to change to a “bottom-up” approach. A project is assessed on the 7 processes and tasks are formulated to make sure every process is controlled. The formulated tasks are distributed among the available resources, taking their experience into account. Management in the project-team happens according to the PMW methodology.

In addition to adapting the model to the project, there is also the possibility to bunch small projects together. Combining the smaller, less complex projects of a certain area or type of asset and managing them by an overarching IPM team provides the possibility to find cohesion among the assignments, making them cheaper to execute. The IPM model is applied with a “top-down” approach while the sub-team is created for the execution phase by the “bottom-up” approach, taking the sub-project and available resources into account. The IPM team is always in the lead, but when tasks become sub-project specific, it is left to a sub-team. Leaving day-to-day operational decision-making to a local sub-team allows the overarching IPM team to focus on managing the entire project without becoming distracted by minor issues on the building site.

7.2 Discussion

The following limitations affected the results of the research performed in this report:

- The data gathered for the performance of the cases were all obtained from the interviews with one team member from each team only. A point of discussion is that investigators fail to develop a protocol to prevent subjective judgment to collect the data. For the study in this report an extensive protocol was created (Section 4.1.2) to minimize personal influence. Even so, the inferences made during an interview can affect the answer of the interviewee.
- The hours spent by resources on a project are logged with the TimeTell computer program. It was not possible to use the data to evaluate the project performance, because not all projects were finished. In the unfinished projects, more working hours were added after obtaining the data.
- Multi-project organizations, like the IB, are subjected to constant change (Jerbrant, 2014). The description made in this Report is a snapshot of the moment the researcher entered the organization, in March 2017. At the time of presenting the report, the IB organization is making progress in adapting the IPM model for smaller, less complex projects.

7.3 Recommendations for further research

While the study was being conducted, points of interest for further research were found. Three points that can be the starting point for further investigations are formulated below.

- The IPM model is used by other project organizations in the Netherlands. The study in this report is performed in an organization that is relatively new. The context of the studied projects could

affect their performance. Further research on the IPM model in projects is recommended in different agencies responsible for executing construction projects.

- In the case studies, hours spent on the projects are not included. The TimeTell database is the only form of portfolio management at the IB. The database offers the possibility to conduct a quantitative comparison of projects that is not explored in the current study. Further research on working hours in relation to project performance is recommended, providing an insight into the suitability of the project management structure and the project's performance on the hours spent.
- Research into the management of smaller projects is relatively new. There is literature to be found on smaller, less complex project management in small-project organizations. The combination of smaller, less complex projects in a large organization is interesting because of the challenge of locating resources. Further research is also recommended on management of small projects in large-project organizations. Resource management is more difficult when staff works on multiple projects at the same time. For an organization, it is a challenge to put in place a structure that can keep track of its resources and provide the flexibility to quickly move between projects.

7.4 Recommendations for the IB

To collect data for this study, there was the possibility of attending different meetings and talking to staff members from different layers in the organization. With those experiences and impressions in mind, practical recommendations are formulated that can be introduced by the IB.

- Introduce active portfolio management to the IB organization (Nicholas & Steyn, 2017). The portfolio management will collect the data now stored in the TimeTell program and can be assessed by the team leaders to evaluate the performance and efficiency of every project, giving the insight into further improvement of project management practices at the IB.
- Further research is recommended to further formulate the characteristics of a small and less complex project of the IB. With the formulation, a better decision can be made whether a project has to be executed with a "top-down" or "bottom-up" approach.
- A project organization with the size of the IB is recommended to have an official PMO (Nicholas & Steyn, 2017). The IPMkernteam is a start for a PMO, but it does not have the means to develop a management structure and does not represent the entire organization. People in the PMO should be able to get a general overview of the entire organization and adjust the management methodologies to the needs of the IB organization and its people.
- Further test the use of the IPM model in an overarching form. It offers benefits in scale, expansion and the combining of clients. However, the value of the local management of "bottom-up" organized projects must not be forgotten. In the search for best applications, there must remain room for on-site management. Also, the fast growth in staff over the years can be partially responsible for the success of the overarching IPM model. Management teams were initially designed for 30 people, but at the time of the study, the number had more than doubled. The more direct management from the overarching IPM team improves overall performance.

7.5 Reflection

Looking back at the time at the IB, I learned to appreciate the profession of project manager. It is impossible to study from the lectures how projects and a project organization function. Through the months I slowly began to see how engaged projects are with their environment and why each of them is unique. The social aspect plays a critical role in the implementation, but is difficult to express. After this research, I sincerely admire people who successfully complete construction projects.

The research that I have carried out will not be taken over literally by the organization. The solution provided to adjust the model for the smaller and less complex projects has its flaws. The value of my research lies mainly in the reinforcement of the importance of the IPM model and the description of where the problems arise. The solutions in the report can give people at the IB a new insight into how the model is viewed.

The process that has been experienced has different points of improvement:

- I started the research with interviewing several members of the IPMkernteam without a fully worked out research design. The interviews helped me understand the IB as an organization, but this could have been done later on in the research. The information on the organization widened the focus which was not always of added value. In the future, a more solid research design should be established before engaging in meetings and interviews.
- It takes time to understand what the essential information of a project is in order to perform a research. During the process, I found out that not all information is always available in the organization. I therefore had to draw my own conclusions about the performance of the projects.
- Because I have dyslexia, writing a report like this is a personal challenge. A challenge that, through conscious practice, makes it easier in the future to produce papers and better convey my ideas to others.

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Appendix A: exploratory interviews

The interviews performed for the exploratory study will be written down in this appendix. The Appendix Chapter consists out of four Sections. First the interview outline is given before the conducted interviews are written down for every interviewee.

Interview outline

The purpose of the interview is to get an understanding of the organization of IB and the implementation of the IPM model at IB. The information needed is best obtained by a neutral open question where the interviewee has the possibility to express his or her opinion on the subject. The interviews will be performed at the canteen of the office of IB. The location is chosen so interviewees are placed in an open and relaxed environment where having a discussion is normal.

This Section will consist of three parts. First describing the proceedings for every interview. Explaining exactly what steps are taken during an interview. Second the selection of interviewees is elaborated. Last the interview questions that will be used to steer the semi structured interview are presented.

Interview proceeding

For the interviewer, a proceeding is noted so it is clear what steps need to be taken. First the interviewer welcomes and they take place at one of the tables at the canteen. Second the interviewee is asked if they mind if the interview is taped. When this is accepted the audio-device is turned on and the opening statement is presented.

Opening statement

"First of all, I want to thank you for your time. I will give a small introduction who I am and the cause of the interview.

My name is Bob van Eeden, student at Delft University of Technology. For my thesis research, I will perform a study into the IPM model at the Ingenieursbureau Amsterdam. At this moment, I am working on the research proposal.

In this interview, I try to understand the view of the IPM focus group on IPM model at the IB. The information collected out of this interview will be used in my research proposal so the interests of the IB are taken into account. I have written down some questions to steer the interview, but it will be an open conversation. Meaning you can tell whatever you find important. I can respond on your answers with a follow up question. Do you have any questions before we start the interview?"

Closing statement

"Once again thank you for your time. If there is anything that I might forgot to ask that is of importance to better understanding the organization and the IPM model please let me know. I will work out the notes."

Interviewees

As said in the Chapter 3 of the main report the IPM on research objective the IPMkernteam is the direct principal from the side of the IB. Therefor the decision is made to select the people in the IPMkernteam as interviewees for the collection of data. A list of all the persons in the team is written down below. Peter Mooij did not have time during the week the interviews were setup.

- Désirée Barendregt
- Paul van Hoek
- Rob van der Hooft
- Elian Ineke
- Etienne Minnaard
- Peter Mooij (not interviewed)
- Sabine Mulders
- Rinske van Schooneveld

Questions

The interview is semi-structured, and therefore questions need to be written down. The questions need to steer the conversation and make sure aspects of the IPM model at the IB are discussed during the interview.

The questions for the interview are:

1. *How is the IPM model at this moment being used by the different project teams of the IB organization?*
 - a. *How many project teams work with the IPM model?*
 - b. *What is the reason some project teams work with the model and some does not?*
 - c. *In what way is the IPM model being used by those project teams?*
 - d. *Which working fields (roles) are used of the model and which are combined?*
 - e. *Is there a consistent use of the different working fields (roles) by the employees of the IB?*
 - f. *What is the reason the division in use is as you describe it?*
 - g. *The areas that are not described in the model, how are they resolved?*
2. *How is the IPM model introduced to the IB organization?*
 - a. *In what way should be the IPM model implemented into the IB organization?*
3. *What is the opinion of the IPM model usability at the IB organization?*
 - a. *Your personal opinion?*
 - b. *The opinion of the IPM focus team?*
4. *What is the overall opinion of employees of IB on the IPM model?*
 - a. *What is the reason this opinion is formed?*
 - b. *Can the opinion of the employees be adjusted over time and how?*
5. *What is in your opinion preferred to be studied in this thesis research taking the IPM focus team in mind?*

Interviews

During the interview notes will be made. These notes are written down on scrap paper and after the interview structured and written down below. All interviews are taped, but the location of the interview has a high volume of background noise. This makes the quality of the tapes low. Every interview has first information on the interviewee, time and location. Afterwards the interview is noted and structured with the questions of previous Section.

Désirée Barendregt

Name: Désirée Barendregt

Function: project- / program manager

Organization: Ingenieursbureau (IB) at the municipality of Amsterdam, the Netherlands

Details: Madam Barendregt previous worked for the Amsterdam City Council Infrastructure Department Traffic and Transportation before she joined the IB. Besides her function as project- / program manager is she also a member of the focus team IPM at the IB.

Data: 14 March 2017

Time: 10:00

Location: Weesperstraat 430, 1018 DN, Amsterdam, the Netherlands

Remark: The interview with Désirée Barendregt was the first out of eight. The interviewer has made changes to the questions after recessing this interview. Therefore some questions are answered in a brief manner or not asked during the interview.

Interview

1. *How is the IPM model at this moment being used by the different project teams of the IB organization?*

a. *How many project teams work with the IPM model?*

It is unclear at this moment how many project teams work with the IPM model. This differs per project and project manager.

b. *What is the reason some project teams work with the model and some does not?*

The question to use IPM is of the client. The municipality has three departments who give the IB projects to perform. These are Verkeer en Openbaarvervoer (V&OR), Grond en Ontwikkeling (G&D), and the seven city districts (CD). V&OR and G&O ask when they put out a commissioning that IPM is used in the management team. For the city districts this is not the case.

c. *In what way is the IPM model being used by those project teams?*

When the size of the project is large enough for five people, IPM will be used in the same way as Rijkswaterstaat. The IB as couple of large projects every year but the general part of the project portfolio are small projects. Projects where the team consist of two or more resources. To be able to use IPM in the small project teams working fields are divided between the two members. Important to take in mind when dividing the working fields is the task of project manager and project controller. To have the possibility of contradiction in the team the project manager and project controller cannot be performed by the same person.

d. *Which working fields (roles) are used of the model and which are combined?*

The project manager and project controller always need to be separated between the two team members. The other working fields are divided on expertise of the team members.

e. *Is there a consistent use of the different working fields (roles) by the employees of the IB?*

This differs from project manager. Every project manager has their own way of approaching a new project. When the client asks for the use of the IPM model in the management team the project manager will implement this also in the way he/she looks fit. The importance is that contradiction is created within the project team.

f. *What is the reason the division in use is as you describe it?*

There is no uniform way of dividing the different working fields.

- g. The areas that are not described in the model, how are they resolved??*
(question not asked in this interview)

2. *How is the IPM model introduced to the IB organization?*

The IPM model is introduced by management of IB in a sudden way. Employees had to choose one of the working fields to specialize. People did not know what every roll implied. Resources were giving presentations and workshops. This way people get to know the model and how to work with it. This created understanding at the IB. Slowly more project teams are using the IPM model. Especially when the client is asking for it.

- h. In what way should be the IPM model implemented into the IB organization?*

At this moment Project Management Team East (PMTE) is reorganizing their department. The working area of PMTE is divided in sub areas. Every sub area has a designated IPM team consisting out of five persons. All the projects that take place in the sub area of that specific management team takes the lead. So, every project team has multiple projects pending. With this organization, there is enough work for project teams of five employees.

How do you make sure there is enough work for every team?

This is a challenge. Now it happens often that people from the new team are placed in other project teams because of a lack of work. The idea is to analyze the plans of the policymakers at the municipality. This way we (IB) know what projects are coming up and can divide the work between the sub areas. Making sure that every IPM team has enough work on hand. One side note, the plans of the policymakers change at every election. So, to for see these changes it is up to the experience managers at IB.

3. *What is the opinion of the IPM model usability at the IB organization?*

Management of the IB sees in the IPM model an improvement in project management. The city of Amsterdam is a complex environment to perform projects. Inhabitants live right next to the construction area, municipal administration is closely involved with the process, and a high technical aspect. The IPM model will improve the coping with risks which are present in each project from the IB.

- i. Your personal opinion?*

I think that the IPM model is an improvement for the IB. It gets the project team to a higher level. The model makes sure that the project team has a critical look at its own process.

- j. The opinion of the IPM focus team?*

The IPM focus team is a good representation of the IB organization. The team consist out of members with a different opinion on the model. What we all have in common is the goal to improve the project management process at the IB.

4. *What is the overall opinion of employees of IB on the IPM model?*

The opinions on the model are divided. Employees hear negative stories. For example, the model ensures that a bike stand is placed with a team of five people. Or that a mediator needs to

intervene in a project team, because team members are fighting over the responsibilities of every working field (role). The negative stories play a part in the opinion of the people at the IB. When employees have worked with the model and know what the working fields represent people tend to be positive about the model.

k. *What is the reason this opinion is formed?*

Mainly because of the negative stories. That is something what happens in every organization.

l. *Can the opinion of the employees be adjusted over time and how?*

Over time I think the opinion will change for the better. More people will work in a project team with the IPM model. They will notice the difference. Convincing the benefits of the model.

m. *Do employees have a question on the use of the IPM model in project teams?*

(question not asked in this interview)

5. *What is in your opinion preferred to be studied in this thesis research taking the IPM focus team in mind?*

For me it is important that the principle of working to gather on common result. In the case of IB, delivering the best projects as possible. In my opinion, the IPM model will help us with this cause. Your research can help to better understand our organization and if or how we can use the IPM model is the most advantage way. Further improving our projects.

Paul van Hoek

Name: Paul van Hoek

Function: Project leader / landscape architect

Organization: Ingenieursbureau (IB) at the municipality of Amsterdam, the Netherlands

Details: Mister van Hoek has previously worked for the city district east before moving to the IB. In April will mister van Hoek quit at the IB and start working for the department Rime en Ontwikkeling at the municipality of Amsterdam.

Data: 20 March 2017

Time: 15:30

Location: Weesperstraat 430, 1018 DN, Amsterdam, the Netherlands

Remark: -

Interview

1. *How is the IPM model at this moment being used by the different project teams of the IB organization?*

a. *How many project teams work with the IPM model?*

There is no straight answer for this question. IPM is mainly used as a framework for an equal way to design a project management team. IPM has helped me for the last two years to improve my projects. The models ensure that all working areas are covered. The division provides that considered decisions are made. My project portfolio consists out of

10 projects of one million Euro instead of one of 10 million Euro. We are in the process of applying IPM onto this kind of smaller projects.

b. What is the reason some project teams work with the model and some does not?

Why a project team uses the IPM model or not, is not entirely clear. Projects need a certain size to let IPM work properly. Designing a team of five people for small projects creates overcapacity. The overcapacity then again creates additional complications.

c. In what way is the IPM model being used by those project teams?

The IPM model ensures the covering of all the working fields. At the start of a small project, the working areas are divided among the team members. So, a team member can have two or more areas of the IPM model.

d. Which working fields (roles) are used of the model and which are combined?

For the division of the different working fields among the team members is no unambiguously way. City district manager has similarities with an SM so these roles can be combined very easily. There is also the possibility to include a team member for a short period in the team when the workload allows it. For example, a contract manager does not be a team member during the whole project. Most important is the coverage of every working field to ensure the IPM theory.

e. Is there a consistent use of the different working fields (roles) by the employees of the IB?

The IPMCT and the five FG have the task to further specialize in the different working fields. The specialization divided and clarifies the roles from each other providing consistent use of each function.

f. What is the reason the division in use is as you describe it?

There is a gradually build-up of the IPM model into the projects. It is up to the PM of each project in what way IPM is incorporated.

g. How resolves the ambiguity in the model into practice?

The level of knowledge of every team members differs. The PM has the task to take the degree of experience of the resources in mind when dividing the roles and is for every project different. When designing a project plan, it is up to the PM to make sure that the project team has enough experience.

2. How is the IPM model introduced to the IB organization?

Small projects need to scan and combined if there is a resemblance with another project in the city district. This process is done in combination with the board of the municipality and district.

The IPM model is most likely to succeed with the bundling of small projects. The incorporated projects provide enough work to form an IPM team. The combining of projects is easier said than done. The client has to consider when designing the project portfolio for the next four years.

The intention of the IPM team in the case of a combined project is also not decided yet. There is a possibility that a team member has two parts or a part only attends the meeting for a shorter period during the project. Until now there is no unambiguously plan to organize small projects.

a. *In what way should be the IPM model implemented into the IB organization?*

Most challenging is making decisions with the board of the municipality and city districts to combine future projects. The merging of projects allows constructing IPM project teams for designated areas in the city.

On the other hand, there is a need of further research on the five IPM roles. The experience of other governmental organizations outside the municipality can help in this process. When the five roles are clearly formulized division on tasks can be made.

3. *What is the opinion of the IPM model usability at the IB organization?*

a. *Your personal opinion?*

The IPM model is very helpful, even on small projects. The model makes sure that all considerations are well organized. Identify the risks clearly, and it is a better way of project preparation.

At this moment linger at one point of professionalism. The IB does not have the same projects as RWS where there is enough work for five people. The interaction project teams of RWS have by seeing each other every day is improving the teamwork. The project of IB is not sufficient to create the same project interaction as RWS does. To create the same community of interest at the IB is a challenge when people work on a different project during the week at various locations throughout the city.

The combining of projects creates a possibility to improve a sense of community, what will improve the performance of the project team.

b. *The opinion of the IPM focus team?*

At this moment, the IPMFT sees the uses of the IPM model only for large projects. The contradiction on those team really to its fullest. To get the same effect in smaller project teams the need of combining project arise. For smaller projects, the IPM model is also important for a consistent way of communication. New team members understand the intention of the project team.

4. *What is the overall opinion of employees of IB on the IPM model?*

a. *What is the reason this opinion is formed?*

You can divide the IB into three groups. First, is the group who is negative on the implementation of the IPM model. This consist out of conservative engineers. Second, is the largest group who are uninformed on the use of the model but not against the change. Third, is the positive group who are familiar with the model from previous projects. Before the reorganization, the old department of IVV worked with IPM. So, they know how the model works.

b. *Can the opinion of the employees be adjusted over time and how?*

In every team, the PM has to take the rest of the process of using IPM by giving them more responsibility. Conservative people are reluctant to give away accountability and increase the chances of them making a mistake. So, steps need to be taken to divide the tasks and show it is not necessary to attend every meeting.

The importance is not to guide the project directly on how to use IPM but provided educational programs for the employees on the different roles.

5. *What is in your opinion preferred to be studied in this thesis research taking the IPM focus team in mind?*

Although the IPM model has to adapt, it provides support for the IB. The changes make sure the design is flexible enough to use in the whole IB organization. In the adaptation process, the IPM model has to lose the RWS dogma.

For a large project, it is clear how to use the IPM model, but for smaller projects, it is still unclear. The IPMCT needs to know how projects are managed in practice. And this way changes the IPM accordingly of even move to a different management model that has can cooperate with the IPM model.

The most important are the way we, the IB, delivers projects. By implementing the strong parts of other management models the organization can further improve the project process.

Etienne Minnaard

Name: Etienne Minnaard

Function: Account manager and team leader of project management team east

Organization: Ingenieursbureau (IB) at the municipality of Amsterdam, the Netherlands

Details: Mister Minnaard worked before the reorganization of the project executive branch of the municipality took place two years ago also for the IB.

Data: 20 March 2017

Time: 14:30

Location: Weesperstraat 430, 1018 DN, Amsterdam, the Netherlands

Remark: Mister Minnaard also suggested an interview with management of the IB. Specially mister Paul van Rossum and Mister Martin Klein. After discussing the suggestion of mister Minnaard with Mister Ineke, research supervisor, a decision is made to incorporate the interviews with general management during the research itself and focus only on the IPMCT for the research proposal.

Interview

1. *How is the IPM model at this moment being used by the different project teams of the IB organization?*

- a. *How many project teams work with the IPM model?*

All projects need to work with IPM, but this is not the case. General management wants a coherent project language throughout the IB. The language allows for better understanding between employees who regularly switch between projects.

- b. *What is the reason some project teams work with the model and some does not?*

The IB is the project executor for the municipality. Three kinds of departments in the whole city provides our organization with projects. The three units are Grond en Ontwikkeling (G&O), Verkeer en Openbareruimte (V&OR), and the seven city districts. The type of client decides the characteristics of the project. The design of a project team is for every project different. In my opinion, it is interesting to do research on projects from all three client types because they use the IPM model in a different way. For

example, the project of G&O is very flexible and can still change during the process, whereas V&OR is more defined.

c. *In what way is the IPM model being used by those project teams?*

When a project has a decent size, the use IPM model works well. For smaller projects, the IPM model created friction within the team. Team members do not know what their responsibilities were. In the less complex project, there is a discussion on working fields. Important is the division of all the roles over the team members, this way all areas of a project are covered. The implementation is slowly and tailored to each project.

d. *Which working fields (roles) are used of the model and which are combined?*

There is no clear division of the five roles. It can occur that a PM also takes on the task of PCM when he or she has the experience.

e. *Is there a consistent use of the different working fields (roles) by the employees of the IB?*

Eventually, employees need so specialize in one or two working fields. But, there is no requirement that a PM and a PCM cannot be performed by the same person.

f. *What is the reason the division in use is as you describe it?*

Only the expertise of the particular person will decide the division of tasks.

g. *How resolves the ambiguity in the model into practice?*

The PM has the task of implementing the IPM ideology into the project team. Ignorance among the team members will create tension. There are examples of a member to take the role too seriously, creating discussions that are unnecessary. Without the IPM model, the extra conversations would not have happened. The immaturity of employees, who work with the IPM model for the first team, has to be resolved by the PM. A good example where the IPM model worked as it was intended is the Klaprozenweg. IPM positively contributes to the internal cooperation and discussion.

2. *How is the IPM model introduced to the IB organization?*

The IB work accordance with the model plan. The program gives space to manage a project in a personal manner. This way projects are not affected by the management changes. The gradual implementation of the IPM model works in my opinion. The IB needs to be patient because direct execution will harm the organization.

a. *In what way should be the IPM model implemented into the IB organization?*

IPM comes originally from DIVV into the IB organization. DIVV used the model before the reorganization two years ago. The introduction into to the projects from G&O and city districts happens slowly. To what degree projects of G&O and different neighborhoods use IPM, I do not know. The status of IPM use is unclear and has to do with the way the IB introduce it into our organization. The important question is where the IB stands on the implementation of the IPM model. There is a possibility that the IPM model lingers at the small projects.

The ideal situation of implementing the IPM model into the IB organization is by combining the small projects. The combining takes place dividing the five city districts the IB uses today into smaller areas. Every area has her IPM team. The reorganization of

resources in this way is the challenge to ensure everybody has enough work. Dividing the workload can only be done by improving the management of the project portfolios of the different clients to make sure that there is sufficient work in every area.

3. *What is the opinion of the IPM model usability at the IB organization?*

The IPM model does not fit for a part of the IB organization. Bundling projects is a smart way the IPM implementation is possible. There are still projects that can only be done in the old way.

a. *Your personal opinion?*

The description of the IPM model is focused inward and unclear at several points. A client has read the report and asked what was the meaning of the IPM model. For the model to work it is needed to change into three standardized models for small, middle and large size projects. Not every detail has to be described in the project plan. Use the common sense of the people working at the IB.

b. *The opinion of the IPM focus team?*

To convince the whole organization to use the IPM model the layer of PM needs to be convinced. When the PM are not satisfied, the gradual implementation of the model will not happen.

4. *What is the overall opinion of employees of IB on the IPM model?*

Old employees of DIVV say that the IPM model is past the expiration date. They have had a bad experience with the model before the reorganization of the IB model.

a. *What is the reason this opinion is formed?*

People do not know the plan of action for the management model. Especially PCM are not familiar with the method. PCM thinks you cannot compare the portfolio of the IB and RWS and see the implementation as forced into the organization.

b. *Can the opinion of the employees be adjusted over time and how?*

The IPMCT has created five FG who are to address the implementation of the IPM model into the IB organization. Every FG works differently. For example, the CM FG clearly defined and PM FG creating learning pathways. TM and SM are still in an orientation phase, but IB has a lot of experience in dealing with a complex environment. The FG for PCM has not started yet, but the IB has a particular department which is specialized in the aspects of this working field.

Very FG has to create an image of a tree. The branches of the tree will represent the aspects of the particular role and the leaves the tasks. In this way, we make the competencies of each field transparent.

5. *What is in your opinion preferred to be studied in this thesis research taking the IPM focus team in mind?*

Where are we, as IB, with the implementation of the IPM model into our organization, after a reorganization of ten departments? Amsterdam is a city that develops more building projects when compared with other municipalities. The organization is constructed to design and construct. The project development creates a demand for infrastructural changes. Other cities' project portfolio is to a significant degree maintenance related.

Therefor Amsterdam can better be compared to a Water boards when analyzing the type of projects executed

Rob van der Hooft

Name: Rob van der Hooft

Function: Project- /programmamanager

Organization: Ingenieursbureau (IB) at the municipality of Amsterdam, the Netherlands

Details: [previous work and function besides day to day function]

Data: 22 March 2017

Time: 13:00

Location: Weesperstraat 430, 1018 DN, Amsterdam, the Netherlands

Remark: mister van der Hooft will send product tables of the old IVV organization.

Interview

1. *How is the IPM model at this moment being used by the different project teams of the IB organization?*

It is subsidiary to the client who provides the project. V&OR has large projects of five million Euro with every role present. Small projects with similarities can be combined. There is a process to combine ten projects for four IPM teams. This process is in an early phase the teams are not complete yet. The IPM model allows good communication between the project teams because they use the same language.

- a. *How many project teams work with the IPM model?*

This number is not clear.

- b. *What is the reason some project teams work with the model and some does not?*

For the most part, it depends on the PM if there is an affinity with IPM. Three-quarter of the teams who use IPM are originally from DIVV before the reorganization. Old PM from the IB is less open to using the new model. The former managers are mostly technical managers.

- c. *In what way is the IPM model being used by those project teams?*

It is hard to say. The way project teams use IPM depends on the PM.

- d. *Which working fields (roles) are used of the model and which are combined?*

There is not one way of dividing the different working fields. IPM ensures it possible to split the tasks.

- e. *Is there a consistent use of the different working fields (roles) by the employees of the IB?*

With the constructing of combined teams the five roles are divided, minus the CM who adds when needed.

- f. *What is the reason the division in use is as you describe it?*

The role division depends on the type of project and the team members. IPM model allows for a grownup discussion. The division in the team is not regulated.

g. How resolves the ambiguity in the model into practice?

The PM is the team leader at this moment with all the knowledge of the project. In the IPM model, the PM has to let go of knowledge and responsibility. Other managers take over the experience and accountability.

2. How is the IPM model introduced to the IB organization?

a. In what way should be the IPM model implemented into the IB organization?

It is going to take another two years for implementing the IPM model into the IB organization. At this moment, the IPMCT is creating practice models. Four blueprints for the type of projects the IB performs. For the projects from the city districts, a plan is made that allows to combine projects.

The four types of projects are:

- V&OR
- City districts
- G&O
- Assets maintenance

The basis for the four plans is from the old DIVV department. The plans did not need to be copied literally but used as guidelines. For example, performing a stakeholder analysis so it would be forgotten.

It is up to the PM to introduce the planes into the project team. The PM has to have a broader trained to understand the task of the other team members to get a constructive discussion.

3. What is the opinion of the IPM model usability at the IB organization?

a. Your personal opinion?

After the investigation of the failures of the North-South metro line, the research committee advised the use of the IPM model. The model creates higher meeting costs, but lower failure costs. The model also promotes cooperation with the contractors on the construction market. IB calls it "smarter with the market". Not everything is done by the IPM model but it ensures everything is taken into account.

The model has to be developing on the four working fields. Major projects like RWS and for smaller projects, IPM is a benefit. IPM shows the risks which otherwise would not have been noticed.

b. The opinion of the IPM focus team?

The IPMCT has a discussion on the guiding lines on how to use IPM. In my opinion, the people need guidance. Projects are for 70 to 80 percent generic.

4. What is the overall opinion of employees of IB on the IPM model?

The overall opinion is getting more confident. Two years after the reorganization the image of the IPM model improves and experiences are exchanged. 20 percent is leader, 60 percent middle group and 20 percent is pessimistic.

a. What is the reason this opinion is formed?

People should be open to new ways of working. Difficult for people to adjust.

b. *Can the opinion of the employees be adjusted over time and how?*

Before the reorganization, the IPM model is first introduced at the DIVV department. The DIVV approach was hard. The implementation was done with a promotion team and very strict.

It is the task of the Account managers not only discuss what to construct but also how. Guiding the project team who are new to the model in using IPM. The positive experience of the model allows will flow through the organization.

5. *What is in your opinion preferred to be studied in this thesis research taking the IPM focus team in mind?*

It interesting to research the creation of the four models. What do the models need to incorporate the IPM way of thinking? What is the best way of implementing the model and solving the differences between the account managers and PM.

Eliau Ineke

Name: Eliau Ineke

Function: Project manager

Organization: Ingenieursbureau (IB) at the municipality of Amsterdam, the Netherlands

Details:

Data: 28 March 2017

Time: 09:30

Location: Weesperstraat 430, 1018 DN, Amsterdam, the Netherlands

Remark: -

Interview

1. *How is the IPM model at this moment being used by the different project teams of the IB organization?*

a. *How many project teams work with the IPM model?*

There is a huge difference between projects. No project provided enough work for a week for a whole team of five people. There is also the possibility of expanding the team to seven members when experts are needed, for example on communications or legal. It is not black and white.

Small projects are most taken place at the city districts. The first ward is starting to combine projects. The joining of ten projects for example allows project team to work with the IPM idea. Projects consist of pavement construction and maintenance who are on its own too small for IPM. All major projects, like a new tram line, with a budget of several million and multiple years to construct have an IPM focus. Last there are small jobs on their own. For instance, a research on ground condition on a certain street. One person projects do not need the IPM model.

b. *What is the reason some project teams work with the model and some does not?*

It has everything to do with the people who are attending the team. Key is the PM. When the PM has a clear view of task distribution with knowledge of the experience of the team members, they can use IPM.

- c. *In what way is the IPM model being used by those project teams?*
In department east, a few people are driving the use of IPM in small projects. (Mister van Hoek and Mister Minnaard). The process can not affect the project itself. The other city districts first need to reorganize before plans can be made on using IPM.
- d. *Which working fields (roles) are used of the model and which are combined?*
There is not one way the division of roles is happening.
- e. *Is there a consistent use of the different working fields (roles) by the employees of the IB?*
Yes, people can focus on two roles, but most of the time they attend the same role in different project teams.
- f. *What is the reason the division in use is as you describe it?*
The expertise of the individual concerned.
- g. *How resolves the ambiguity in the model into practice?*
How the project team is operating is for the most part up to the PM. The project characteristics are always different and very nuanced.
Aspects that define a project are:
- The personal approach of the PM
 - The client
 - The team members
 - Complexity
 - Time pressure.

When a PM puts a project team together is a very social process. The PM have worked with them in the past and has a list of favorite people to work with. The level of experience in teamwork, contract and project of example. Frequently the people in question do not have time to join the team.

When I look at the future of the project portfolio of the IB the projects becoming more complex. Not all people of the IB are suitable to perform in a project team were IPM is used.

2. *How is the IPM model introduced to the IB organization?*
- a. *In what way should be the IPM model implemented into the IB organization?*
Management and the IPMCT have chosen to approach IPM slowly like an oil spill, slowly spreading. Communications are passive. IPMCT do not advise using the IPM model. Only web pages inform on the model. Before the reorganization, the IPM model is introduced in a concrete way at the DIVV, this was not popular among the employees.

When you think about it logically, the combination of smaller projects can also be financial interesting. Proving this will be hard because of the status accounting on the IB. The process of combining cannot get complex, taking way the advantages of the model.

3. *What is the opinion of the IPM model usability at the IB organization?*

a. *Your personal opinion?*

I find it bizarre that an organization as the IB every PM has an own approach to project management. So is the cooperation with contractors much harder and a lack of organizational professionally. The IB can only move forward by regulating the process, to some extent. The controlled execution of a project.

Multiple government clients use the IPM model, and this convinced the IB to introduce the model. Contractors start to mirror their project teams to the IPM team for better cooperation. Amsterdam always wants to do it differently, but there is nothing wrong with the basis of the model.

b. *The opinion of the IPM focus team?*

In the IPMCT it is shown that people are from different departments before the reorganization. DIVV has developed a lot on IPM and think it is superfluous to talk about it again. But with the various projects that the IB perform at the moment, the IPMCT has the task of the overall view of the process. Making sure that the different working fields are progressing and communicate.

4. *What is the overall opinion of employees of IB on the IPM model?*

The word IPM is not popular amongst a group of people at the IB. When you start a discussion with the critical person most of the time, they are less cynical about the use of the model. The process of introducing the model to the IB organization is two years on the way. The belief in the model is rising.

a. *What is the reason this opinion is formed?*

Unfamiliar with new approach.

b. *Can the opinion of the employees be adjusted over time and how?*

Do not give opponents of the model attention. The group will be gradually smaller. When using the IPM model the name does not have to be mentioned, making it easier to introduce in a project team.

Most important is not make rushed decisions, after the reorganization of the IB more important points were on the agenda. Now the IB is functioning again, and management changes can gradually be made. The most relevant to the implementation is the overall acceptance. It does not matter if it would take a year longer.

5. *What is in your opinion preferred to be studied in this thesis research taking the IPM focus team in mind?*

RWS took ten years of implementing the model into projects of 65 million. Amsterdam is two years on the way for projects of ten million or less. The IB has a more nuanced view on the use of the model and the added value. For large projects the IPM model has advantages. Smaller projects changes have to be made to apply the model. Combining projects can be interesting.

Sabine Mulders

Name: Sabine Mulders (SM)

Function: assistant project leader/ project control

Organization: Ingenieursbureau (IB) at the municipality of Amsterdam, the Netherlands

Details:

Data: 22 March 2017

Time: 16:30

Location: Weesperstraat 430, 1018 DN, Amsterdam, the Netherlands

Remark: -

Interview

1. *How is the IPM model at this moment being used by the different project teams of the IB organization?*

It differs from the client of the project. I have a good view of the city districts because that is the department I operate. Projects at most city areas still work with the old GAW approach.

- a. *How many project teams work with the IPM model?*
IPM is still in a very early phase for the city districts. Only the team of Paul van Hoek is applying the model by combing projects.
- b. *What is the reason some project teams work with the model and some does not?*
The IPM model project team is to large of the type of projects the city district provides. For example, a SM is unnecessary, the PM will take this task. Also, a CM will only attend the meeting when needed.
- c. *In what way is the IPM model being used by those project teams?*
The city districts are divided into sub-areas, but the projects are still managed in the old way.
- d. *Which working fields (roles) are used of the model and which are combined?*
The creation of new project teams is hard. People finding it more interesting to work on large complex projects. It is not "sexy" to work in a city district management team because of this the project planner still does a lot of the work.
- e. *Is there a consistent use of the different working fields (roles) by the employees of the IB?*
In the city district, the project planner is very familiar with the neighborhood and does a lot of the different takes. Tasks that normally a TM or SM would do.
- f. *What is the reason the division in use is as you describe it?*
This is the old way of management were the city districts are used to before the reorganization.
- g. *How resolves the ambiguity in the model into practice?*
The PM tasks to solve the problems in the project teams but in most city, districts the model is not used.

2. *How is the IPM model introduced to the IB organization?*
 - a. *In what way should be the IPM model implemented into the IB organization?*

The teams do not need five people. When a particular role is required, they will attend the meetings. If projects are combined, it would be possible for five team members but do not think it could work. There is not enough work for everybody. A CM can better be the same as a risk manager or planner. For big projects the IPM model is justified.
3. *What is the opinion of the IPM model usability at the IB organization?*
 - a. *Your personal opinion?*

The IPM model adds value to the project team. The discussions in the team make sure that the lead time of a project is better than before the introduction of the model. The IB is now to years using the model, and a tipping point can be seen.
 - b. *The opinion of the IPM focus team?*

Capacity to use IPM teams. Sometimes there are only two people in a team. For this reason, need to be methods accepted dual roles in small projects. This does not change the way the IB is managing the projects. Resource management has to change. Create guide lines that help project planners adjust to IPM
4. *What is the overall opinion of employees of IB on the IPM model?*
 - a. *What is the reason this opinion is formed?*

The project planner is doing the work the same way for years and knows what needs to happen in the city district. The IPM model is trying to create a discussion what is redundant in the eyes of the planner.
 - b. *Can the opinion of the employees be adjusted over time and how?*

Other people see the IPM model work out of own experience, in this process, they convince other people. Improvement of cooperation and trust in the model. Some employees stay critical concerning the model they will keep you focused.
5. *What is in your opinion preferred to be studied in this thesis research taking the IPM focus team in mind?*

Investigate the internal view of the model. In this way, adjust the vision change the IB and implementation.

Rinske van Schooneveld

Name: Rinske van Schooneveld (RS)

Function: Technical manager

Organization: Ingenieursbureau (IB) at the municipality of Amsterdam, the Netherlands

Details: Mrs. van Schooneveld previously worked for the development department of the municipality of Amsterdam. After the reorganization, she became part the IB.

Data: 24 March 2017

Time: 09:30

Location: Weesperstraat 430, 1018 DN, Amsterdam, the Netherlands

Remark: Mrs. van Schooneveld will send the research on the IPM model used in practice by project teams called "Over de streek". This study was performed to get an indication to what degree the IPM model is used.

Interview

1. *How is the IPM model at this moment being used by the different project teams of the IB organization?*
 - a. *How many project teams work with the IPM model?*

For the large project, IPM works well. Only sometimes there is indistinctness between the TM, CM and OM on tasks, for example, conditioning. By combining small project allows the IB to apply IPM.
 - b. *What is the reason some project teams work with the model and some does not?*

This size of the project allows the use of IPM. A Clear separation for when to use the model on a project and when not is hard to indicate. A demarcation can make on project budgets and system projects, like bridges and underground car parks. Projects on ground surfaces are less involved and IPM does not always applicable.
 - c. *In what way is the IPM model being used by those project teams?*

The IPM model allows that all is assured. The PM is not focusing on one thing but has to divided attention to multiple aspects.
 - d. *Which working fields (roles) are used of the model and which are combined?*

The distribution of roles is not prescribed by the IB. It is a personal consideration on the experience of the team members how to divide the tasks.
 - e. *Is there a consistent use of the different working fields (roles) by the employees of the IB?*

PM from the city districts are more focused on the old management model.
 - f. *What is the reason the division in use is as you describe it?*

The projects of the city districts are small. The small projects do not need a lot of people to carry out. With IPM the task that was performed by one manager now has to be divided by two or more. PM from the city districts find the process challenging and hard to let go.
 - g. *How resolves the ambiguity in the model into practice?*

The project manager resolves the problem itself or lets an expert come in.
2. *How is the IPM model introduced to the IB organization?*
 - a. *In what way should be the IPM model implemented into the IB organization?*

The IB has to combine the small projects. The combining of the projects lower the number of meetings, improves cooperation and working fields are better represented. People need to take and get more responsibility. It can happen a person has more than one task in a team or different parts in various groups. Five people perform the five roles separately is not necessary but the best way to ensure the roll. Every project is tailored.
3. *What is the opinion of the IPM model usability at the IB organization?*
 - a. *Your personal opinion?*

The IPM model allows contradiction that improves the product in the end. It is not necessary to have five people all the time on the project team, but at critical moments experts can join. When the team performance is the right way, it further improves the product they deliver.

Working in a project team is hard. The risk of IPM is that the roles go on their own and lose communication between them. The five managers had a group of specialist they represent. In the past, the expert could talk directly to the PM. Now a new layer of management is added in the view of the expert.

My opinion the IB is an engineering firm and project management is not our core business. So, when analyzing the task of the PCM, it is hard to define the tasks they carry out. In essence, the PCM makes sure a discussion arises.

The OM FG is not defined yet and has a lot of overlap with TM. During the IPMCT a discussion has to decide who takes what responsibility, taking soft skills of the OM in consideration. The division of tasks does not have to be strict. The experience of the team members can change the role distribution.

At this moment, I am a CM and TM in a project because a young team member does not have the experience to engage in discussions with the contractor. Although the young team member has no direct responsibility, he is part of the debates and keeps me sharp by ensuring the task of CM.

Another example of the proper functioning IPM model is the letting go of the responsibilities of the CM by the PM. Otherwise during a conversation between the CM and contractor were the PM is present the role of CM dissolves because the contractor talks directly to the PM.

b. *The opinion of the IPM focus team?*

Colleagues are not against the model anymore. We conducted a field research ourselves. Asking people if they still feel a sense of hierarchy in the project teams. A large number of teams are at a reasonable level but creating contradiction is difficult. Groups experience the IPM model as positive and see more depth in the project. Experts are of the opinion that the amount of meeting is too high. Guidelines will help the city districts to use the IPM model. The guidelines cannot be too complex.

4. *What is the overall opinion of employees of IB on the IPM model?*

a. *What is the reason this opinion is formed?*

The IB project portfolio has a wide range of projects. From less complex ground level projects to metro lines crossing the city center. The people who work on the low complex projects appreciate continuity and are less open to change. In high complex projects, the team members are more flexible and used to change in management so using the IPM model is less difficult for them. This difference makes the application of the IPM model for city district projects take more time.

b. *Can the opinion of the employees be adjusted over time and how?*

People do not see right away the positive side of the model. Employees are hard to convince and can only be done by other city districts were the model had proven itself. It can be done by discussing to get contradiction into the project team without mentioning the IPM model.

5. *What is in your opinion preferred to be studied in this thesis research taking the IPM focus team in mind?*

Will think about and let you know later on.

Appendix B: observation of IPMkernteam meetings

Minutes

This Section contains the copies of the minutes made of the 25th and 26th IPMCT meeting. This information can only use in this thesis research.

Minutes 25th meeting



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Actielijst werkgroep IPM; onderdeel van de IB ontwikkelagenda punt 8D → toepassen IPM gedachtegoed

Ons kenmerk	25 ^e overleg Werkgroep IPM
Vergadering	21 februari 2017
Aanwezig	Elian Ineke, Peter Mooij, Désirée Barendregt, Paul van Hoek, en Sabine Mulders
Afwezig	Etienne Minnaard, Rob van der Hoof en Rinske van Schooneveld
Kopie aan	
Onderwerp	Werkgroep IPM

Actie	Omschrijving
	1. Opening/mededelingen
	Van het 24 ^{ste} overleg is geen verslag gemaakt.
	Rob heeft zich afgemeld vanwege ziekte en het concept jaarplan van de vakgroep Projectbeheersing gemaald die als bijlage bij deze notulen wordt verspreid. Etienne en Rinske zijn met vakantie.
	Paul meldt dat hij per 1 april bij R&D als hoofd ontwerper start. De volgende bijeenkomst zal hij Tim Boogaard (IPL SDZO en SDO projecten) meenemen die het erg leuk om de rol van Paul over te nemen.
	2. Actielijst doorlopen
	Deze is doorlopen en aan het eind van dit verslag in de actielijst verwerkt.
	3. E learning module RWS
	Iedereen had de test gemaakt> De een vond hem te star, teveel manager benamingen, en niet zozeer op rol en de ander vond het een handig middel. Uiteindelijk waren we het eens dat je wel kennis/ervaring moest hebben van IPM om de test goed in te voeren. Als uitgangspunt samenwerking was vonden sommigen het een handige tool.

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Actie	Omschrijving
	<p>Intern voor IB niet geschikt vanwege de gebruikte benamingen maar wel een leuke oefening voor IPM teams, focusteams etc. Voorstel van Elian om dit op de toekomstige website van IPM als tool neer te zetten, niet op intranet of tamtam.</p>
Desiree	<p>Over een paar maanden als follow up naar de teams van over de streep.</p> <hr/> <p>4. Rondje langs de werkvelden</p> <p><u>Contracten:</u> Peter heeft vooraf aan de vergadering de visie en ambitie kenbaar gemaakt van het focusteam Contracten. Deze waren kort en bondig en daardoor erg helder. Binnen het focusteam heeft peter de rol van verbinder waarbij hij let om niet teveel thema's op de agenda te zetten, dit om focus te houden en de aandachtspunten vanuit het focusteam centraal te houden. Aandachtspunten voor de komende periode zijn:</p> <ol style="list-style-type: none"> 1. Meer raakvlakken zoeken met de andere bomen; 2. Contact met mensen uit andere focusteams door in subgroepen inhoudelijke sessies te voeren. (v.b. V&V --> techniek en contracten eind maart)
Rolhouders	<p>Er wordt voorgesteld om de volgende vergadering per focusteam werkveld 3 punten te benoemen die op de agenda van het focusteam komt te staan.</p> <p><u>Omgeving:</u> Desiree zal het vervolgoverleg van haar focusteam gaan inplannen. Het aandachtspunt uit haar focusteam richt zich vooral op relatie zoeken met techniek en de rolverdeling hierbinnen.</p> <p><u>Projectmanagement:</u> De prioriteit ligt vooral op leerlijnen ontwikkelen met Cees Runneboom en naar verwachting in de zomer gerealiseerd. Daarnaast komen andere zaken als integriteit en een evaluatie sessie tenderboard aan bod onder leiding van 2 onafhankelijke gespreksleiders. Verder wordt bekeken welke mensen binnenkort in de rol van IPL passen. Paul geeft aan dat PM niet op inhoud maar op hoofdlijnen helderheid probeert te creëren wat anders is aan IPM dan PM.</p> <p>Desiree hoort vanuit haar rol als Pm nooit iets over het focusteam PM en vraagt zich af waar dat aan ligt en of iedereen wel voldoende is aangehaakt.</p> <hr/> <p>5. Invulling IPM windrichting Oost Ambitieplan Contracten</p> <p>Paul geeft een korte presentatie aan de hand van de notitie van windrichting Oost die vooraf is toegezonden. Binnen IB is gekozen om deze werkwijze over te nemen.</p> <hr/> <p>6. IPM Kennisbijeenkomst Brabant</p> <p>Elian en Etienne zijn naar decentrale overheid IPM bijeenkomst geweest waarbij een 40 tal deelnemers aanwezig waren vanuit provincies, waterschappen en</p>

Appendix B: observation of IPMkernteam meetings

Gemeente Amsterdam

Kenmerk 23e overleg
Werkgroep IPM
Pagina 3 van 3

Actie	Omschrijving
Allen	gemeentes. Vanuit RWS was een gastspreker. Er was veel herkenning en bij velen nog zoekende hoe dit op kleine projecten toe te passen. Ook kwam het bundelen van projecten aan de orde. Elian heeft het gevoel dat wij met de juiste dingen bezig zijn. Verslag en presentatie zal Elian nasturen.
7. Afstudeeropdracht IPM	
	Elian gaat ene gesprek plannen met de student en Peter of Desiree zullen aansluiten.
8. Rondvraag en sluiting	
Rolhouders	Er wordt afgesproken dat elke rolhouder de boom in kleur en op A3 meeneemt naar ons volgend overleg om vervolgens raakvlakken te definiëren.

Actiepunten-/besluitenlijst

Actie nr.	Actie datum	Actie door	Omschrijving actie	Actie gereed op
16.1	26-4-16	Allen	Brainstormen Over de Streep (Directie / management sessie)	vv
16.2	26-4-16	Elian	Communicatiestrategie en indeling website qua layout en inhoudelijk uitwerken: In het overleg van 21-2-17 is afgestemd dit bij focusteams te leggen door van elk 1 afgevaardigde samen te brengen om hier afstemming in te vinden. Pleuni Niezing aan koppelen. Streven is medio maart een groepje bij elkaar te hebben. Via rolhouders IPM wordt dit bij Focusteams bekend gemaakt.	Medio mrt 2017
21.1	4-10-16	Elian	IPM sessie naar Den-Haag plannen	Eind 2017
23.2	29-11-16	Elian	Sessie doelen 2017	vv
25.1	21-2-2017	Desiree	RWS E learning naar teams over de streep sturen als follow up	Medio 2017
25.2	21-2-2017	Rolhouders	Top 3 aandachtspunten per focusteams	vv
25.3	21-2-2017	Rolhouders	Projectenboom in kleur op A3 mee om raakvlakken te definiëren.	vv

Minutes 26th meeting



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Actielijst werkgroep IPM; onderdeel van de IB ontwikkelagenda punt 8D → toepassen IPM gedachtegoed

Ons kenmerk	26 ^e overleg Werkgroep IPM
Vergadering	21 maart 2017
Aanwezig	Etienne Minnaard, Rob van der Hoof en Rinske van Schooneveld, Désirée Barendregt, Paul van Hoek, Bob van Eeden en Sabine Mulders
Afwezig	Elian Ineke, Peter Mooij
Kopie aan	
Onderwerp	Werkgroep IPM

Actie	Omschrijving
	1. Opening/mededelingen
	Elian en Peter hebben zich afgemeld.
	Bob van Eeden stelt zich voor en informeert de aanwezigen over zijn afstudeeropdracht voor de TU Delft. De komende week houdt hij met alle deelnemers binnen het kernteam een interview. Hierdoor hoopt hij zich een beeld te vormen van de organisatie. Vervolgens zal hij ongeveer 3 weken uittrekken om te onderzoeken op welke wijze hij de opdracht gaat insteken. De TU zal hem hierin adviseren. Elian begeleidt Rob vanuit het IB. Hij gaat nog een planning opstellen maar verwacht na ongeveer 7 maanden af te ronden.
Sabine	Sabine heeft een begin gemaakt met het IPM archief waarin ook de focusteams kunnen aansluiten. Nu hebben enkel de teamleden nog toegang tot het archief, dit dient voor alle medewerkers IB toegankelijk te zijn en wordt aangevraagd bij ICT
	2. Actielijst doorlopen
	Deze is doorlopen en aan het eind van dit verslag in de actielijst verwerkt.
	3. Focusteams
	<u>Top 3 to do</u>
	PB: De top 3 van projectbeheersing is nog niet vastgesteld maar dat zal plaatsvinden

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Actie	Omschrijving
	<p>op woensdag 22 maart 2017.</p> <p>OM: Heeft 23 maart haar eerste focusteam sessie en heeft gebrainstormd over de afstemming met CM en TM om te borgen dat zaken niet dubbel gedaan worden of door niemand.</p> <p>TM: 1) Wat is TM? Competenties en leerlijnen ontwikkelen binnen de rol. 2) Inkoop: Wanneer kies je voor D&C of RAW, hoe stel je jouw team samen, welke keuze heb je om andere diensten in te kopen. 3) Specialismen, waar hebben we behoefte aan binnen IB.</p> <p>PM: 1) wat hebben we aan projectleiders. 2) ontwikkelingen leerlijnen; competenties en affiniteit</p> <p><u>Raakvlakken</u></p> <p>Er worden een aantal raakvlakken bij verschillende rollen weergegeven. System engineering komt voor bij TM maar ook bij PB en OM. SCB ligt procesmatig bij OM maar inhoudelijk TM; conditionering heeft raakvlak met OM en TM. Bij PM ziet men raakvlakken met PB die Elian met Madeleine van der Ven gaat bespreken.</p> <p>Men is het eens dat de raakvlakken bottum up inzichtelijk gemaakt moeten worden, daarom iets voor de focusteams en niet vanuit het kernteam. Wel goed omdat in het kernteam terug te leggen om aan te vullen.</p> <p><u>Svz</u></p> <p>Rob geeft aan dat hij van mening is dat het focusteam (vertegenwoordigd door 10 personen van alle OG's) te weinig als klankbord wordt gebruikt voor het programma doorontwikkeling PB van Madeleine. Hij geeft aan dat het pva niet smart genoeg is, de boom nog verder ontwikkeld moet worden. De vakgroep heeft een jaarplan waarin diverse thema's staan opgenomen.</p>
	<hr/> <p>4. Terugkoppeling</p> <p>Vanwege afwezigheid van Elian en Peter kan er geen terugkoppeling plaatsvinden over het gesprek met Renee en Martine betreffende Productentabellen en 3 IPM modellen voor 3 typen projecten.</p>
	<hr/> <p>5. Rondvraag</p> <p>IN het kader van doelen stellen voor 2017 kwam het volgende naar boven:</p> <p>Wat is de meerwaarde van het IPM kernteam:</p> <ul style="list-style-type: none">• Bewaken• Onderling verbinding leggen

Appendix B: observation of IPMkernteam meetings

Gemeente Amsterdam

Kenmerk 23e overleg
Werkgroep IPM
Pagina 3 van 3

Actie	Omschrijving
	Sabine zal bij Elian navragen of hier en overleg aan gewijd kan worden om middels post-its te brainstormen. Blijft als actiepunt staan.
	Over de streep directie: Etienne oppert dat wellicht Bob kan nadenken over een over de streep tussen directie en kernteam. Verder bleken stadsdelen Zuid en Nieuw West interesse te hebben om dit te doen.
	Rob vraagt naar de kennissessie in Den Bosch,. Hier heeft Elian een verslag van rondgestuurd. Etienne vult aan dat opmerkelijk was dat de waterschappen omgevingsmanagement heel belangrijk zijn gaan vinden sinds zij met gebieden werken en dat RWS die toch al in 2002 gefaseerd is begonnen nu pas beheer heeft geïntegreerd.

Actiepunten-/besluitenlijst

Actie nr.	Actie datum	Actie door	Omschrijving actie	Actie gereed op
16.1	26-4-16	Allen	Brainstormen Over de Streep (Directie / management sessie)	vv
16.2	26-4-16	Elian	Communicatiestrategie en indeling website qua layout en inhoudelijk uitwerken: In het overleg van 21-2-17 is afgestemd dit bij focusteams te leggen door van elk 1 afgevaardigde samen te brengen om hier afstemming in te vinden. Pleuni Niezing aan koppelen. Streven is medio maart een groepje bij elkaar te hebben. Via rolhouders IPM wordt dit bij Focusteams bekend gemaakt. 21-3: leden kernteam vragen na in hun focusteams.	vv
21.1	4-10-16	Elian	IPM sessie naar Den-Haag plannen	Eind 2017
23.2	29-11-16	Elian/Sabine	Sessie doelen 2017; bespreken met Elian om na te gaan hoe hier invulling aan te geven. (een heel overleg brainstormen, geeltjes?)	Nog te bepalen
25.1	21-2-2017	Desiree	RWS E learning naar teams over de streep sturen als follow up	Medio 2017
25.2	21-2-2017	Rolhouders	Top 3 aandachtspunten per focusteams; 23-3: Er is een start gemaakt, TM en PM hebben hun speerpunten aangegeven, de overige rollen wellicht de volgende bijeenkomst.	vv
26.1	21-3-2017	Sabine	Archief IPM toegankelijk maken voor allen binnen IB	vv

Observation

During the meeting of March 27, 2017, observation notes made of the points on the agenda. It will provide an additional impression of the topics discussed and information on the status of the model in the organization. Out of practical and privacy reasons no names mentioned in the comments. The words in

italic are the points on the agenda. Words in a standard font is the observation summary made by the observer at this point during the meeting.

- *Opening and announcements*
 - *Present*

Etienne Minnaard, Paul van Hoek, Rob van het Hooft, Rinske Schooneveld, Désirée Barendregt, Sabine Mulders, Bob van Eeden
 - *Welkome Tim Boogaard and Bob van Eeden*

Mister Boogaard is not present. Mister van Eeden introduces himself.
 - *Archive*

All the files of the IPMCT will be made available for the whole IB organization. This way all employees can find information on the model and certain working fields.

- *Remarks Bob on research plan*

An introduction is given on the thesis research, explaining the intention of the study, the methodology, and the overall planning. The IPMCT help with the selection of case studies.

- *Focus Groups*
 - *Top 3 "to do's" by focus group*

Every FG has come together to discuss the three most important "to do's" for the implementation and development of every role in the IB. To give in a transparent manner which aspects associated with each working field every FG made an image of a tree. The branches of the three represent the critical dimensions of the particular roll, and the leaves represent actions or tasks. The status of every FG discusses individually.

 - *Focus team surroundings manager*

When making the tree, there is a common ground between the roles and certain tasks. A discussion arises hot to distributed the responsibilities among the different roles. For example, making a stakeholder analysis. Is this the responsibility of the SM or TM or both? Most important are that a stakeholder analysis is performed, but who takes the lead? Connections have to be made between the FG.

To invest in the surroundings manager conditioning has to be appointed. Hard to get it right because, in practice, it is always different.
 - *Focus team technical manager*

FG for TM first had to fill the team and invest time to define the role before plans can make for improvements and implementation. They are now at the point of making decisions and designing a tree. Vital for the TM to improve is the keep the expertise in the organization. By doing a certain complex project for example. Interfaces between the TM and other roles are high. What is the task of the TM and where does he only need to give comment and advice? So, it is recommended that both the surroundings and technical manager go to the client. A project approach needs to design for three project types. Difficult wear to what degree you define tasks and dividing them between working fields. The dividing of tasks is different for every project.
 - *Focus team integrated project manager*

The FG PM has a clear picture what the top three "to do's" are. Most important is to introduce a learning pathway. Creating an educational program is for every FG important. Competencies are now described, and the interfaces with the other roles have to be written down. The basic knowledge of every role is for a PM necessary as is the decision-making. New is the knowledge sharing between the different PMs.

- *Focus team project control manager*
This month is the month of PCM. At this moment, the action plan is not made yet. The need for further develop a plan and also the tree.
- *Focus team contract manager*
The representative of focus team CM was not present at the meeting.
- *Trees on your own A3: working sessions to check trees overlap / duplication / gaps*
Not every FG has a designed a tree yet because some teams still investigating their aspects and tasks.
- *Round SVZ focus teams*
- *Feedback*
 - *Feedback. call Peter, Renee Martine and Elian have had. Need for (a) products table and (b) 3 IPM models for three types of projects*
Mister Ineke is not present at the meeting. The product table used in the past by the IB and other municipality agencies, before the reorganization, can be used as base for the three project plans. The types of projects are defined by the three clients of the IB has.
- *Open Action points*
 - *Brainstorming on the stripe Board session*
Interview between management of IB and IPMCT.
 - *Session goals in 2017*
At this moment, it is unclearing what the goals are for all the FGs and the IPMCT as a whole. Next meeting a brainstorm session will be organized to come up with goals of 2017.
- *Questions and close*
- *Nothing mentioned*

Appendix C: Case study protocol questions

This appendix presents the questions asked during the interviews in Table 5.

Table 5 questions for case study interviews in Dutch.

#	Question
A	General
A.1	Naam
A.2	Project rol?
A.3	Actief in andere projecten tijdens uitvoering van dit project?
B	Team leden
B.1	Wie waren er onderdeel van het vaste projectteam?
B.2	Welke mensen zijn er voor korte tijd bij het projectteam gekomen?
B.3	Welke rol hadden de mensen in het team?
B.4	Uit welke afdelingen van de IB organisatie kwamen de teamleden?
B.5	Hoe zijn de mensen geselecteerd voor het project?
C	Project characteristics
C.1	Wat is de scope van het project en is deze veranderd?
C.2	Hoe lang duurde het project?
C.3	Was er tijdsdruk?
C.4	Wat was het budget voor het project?
C.5	Waren er andere projecten die dit project beïnvloedde? Zo ja, welke?
C.6	Waren er subprojecten die dit project beïnvloedde? Zo ja, welke?
C.7	Waren er meerdere technische disciplines aanwezig in het project? Zo ja, welke?
C.8	Waren de juiste mensen met vaardigheden beschikbaar?
C.9	Waren alle teamleden beschikbaar tijdens het hele project?
C.10	Was de locatie van het project van invloed op het verloop?
C.11	Was het bouwterrein goed bereikbaar?
C.12	Was het bouwterrein groot genoeg?
C.13	Voor het project in de uitvoering ging was het aangemerkt als hoog risico?
C.14	Welke type externe stakeholders waren aanwezig in het project?
C.15	Wat was de invloed van de externe stakeholders op het project?
C.16	Was er politieke invloed? En zo ja, hoe?
D	Project uitvoering
D.1	Is er een model gehanteerd? Zo ja, welke en is deze aangepast aan het project?
D.2	Zijn daarbij aanpassing gepleegd met betrekking tot de verdeling van verantwoordelijkheden en bevoegdheden?
D.3	In hoeverre heeft de verdeling geholpen bij het afgewegen/bespreken van beslissingen?
D.4	Hoe worden beslissing gemaakt?
D.5	Hoe worden meningsverschillen opgelost?
D.6	Hoe wordt het werk verdeeld?
D.7	Hoe wordt afgeronde taken gecontroleerd?
D.8	Hoe is een open discussie gewaarborgd in het team?
D.9	Hoe vaak komt het team samen?
D.10	Hoe wordt de uitvoering van het totale project gechecked
D.11	Hoe was de uitvoering van het project op het gebied van tijd, budget en kwaliteit?
D.12	Welke incidenten deden zich voor tijdens het project die de uitvoering beïnvloedden?
D.13	Kunnen alle teamleden goed werken in het organisatiemodel?
D.14	Was de organisatie van het project van invloed op de uitvoering?
D.15	Als achteraf terug kijkt had een andere organisatie uitgemaakt voor de uitvoering?

the table continuous on the next page

Appendix C: Case study protocol questions

E	Project activiteiten
E.1	Project organisatie opgezet?
E.2	Wie heeft de project scope vastgesteld?
E.3	Hoe is de opdrachtgever gerapporteerd tijdens het project?
E.4	Hoe heeft de project planning gemaakt?
E.5	Hoe werden de documenten beheert in het project?
E.6	Wie was verantwoordelijk voor project beheersing financiën, tijd, scope, kwaliteit?
E.7	Verslaglegging overleg?
E.8	Informatie uitwisseling tussen omgeving en project team (conditionering, eisen)?
E.9	Stakeholder analyse, stakeholder strategie, communicatieplan?
E.10	Toetsing van geleverd werk door aannemer?
E.11	Technische ontwerp testen op gestelde eisen?
E.12	Aansturing extern ingewonnen advies
E.13	Programma van eisen?
E.14	Aanbestedings traject?
E.15	Contact aannemer?
E.16	Contract ontwerp met scope, tijd, geld, kwaliteit, risico's?
F	Gebruik IPM model in IB
F.1	Zou het gebruik van het IPM model nuttig zijn geweest voor dit project?
F.2	Wat zijn de voor- en nadelen van het IPM model?
F.3	Op welke projecten kan je het IPM model goed toepassen?
F.4	Heb jij nog aanbevelingen voor het gebruik van het IPM model bij het IB?

Appendix D: Data of the cases

All the data of the eight cases is presented in this Appendix. The case description is divided in five parts:

- First, the project is elaborated on scope, execution and performance.
- Second, the organization and roles are discussed and visualized with a figure.
- Third, the management of the project in practice is mentioned.
- Fourth, the table with 16 tasks and who executed them are presented.
- Lastly, the personal view of the interviewee on using the IPM model in smaller projects at the IB is discussed.

Case 1: Amstelkwartier 1e Fase

The interviewee is Marieke Takken, Project leader of the AK1 project. Mrs Takken first had the task of Job Preparer in the Ak1 project team before she became Project leader in the beginning of 2017. This is the first time Mrs Takken performs the role of Project leader. Beside the AK1 project is Mrs Takken also involved in other sub projects of Overamstel. The interview is performed on Wednesday, 23rd of August 2017 at the Weesperstraat office of the IB in Amsterdam.

Project and project performance

The scope of the AK1 project is to prepare the building site for construction of new dwellings, according to the interviewee. The activities that need to be done are, demolish existing structures and clean site from debris, the placement and replacement of cables and pipes, and finally finish the site for living purposes including a park at the waterside. The AK1 project team is responsible for overseeing and coordinating all activities on the building site.

The AK1 project started in 2012 and has been delayed several times, says the interviewee. In phases building lots are handed over to the contractors of the project developers. The time pressure to meet the deadline is high because of financial consequences with the development companies. Over time, buildings are finished and new inhabitants move in. Slowly, the building site get more crowded because of the amount of different activities increases and there are more stakeholders to take into account. During building activities changes are made to the design and planning. There is no overview of the total budget of the AK1 project. For the year of 2017 there is an estimated made of 164,663 Euro. There were enough resources available otherwise there was the ability to hire people externally.

The project leader states the following stakeholders are present at the AK1 project: clients G&O and the real estate companies, contractors working for the Ak1 team, contractors of the utility companies, contractors of the development organizations, inhabitants that move in the finished homes, and city district East who is will be responsible for the new district. The AK1 team is responsible for coordinating the three contractor's active on site. Managing the two external contractors is hard because they are not responsible for their activities. When the external contractors do not meet the planning, the AK1 team has to adjust.

Organization and roles

The AK1 sub-project is part of the overarching Overamstel project, as shown in Figure 23. The words in bold are management teams or external stakeholders and words in italic are roles in the organization. Four other projects are part of the total program, these are Amstelkwartier 2e fase (AK2), Amstelkwartier 3e

fase (AK₃), Weespertrekvaart Midden Zuid (WMZ), and Kop Weespertrekvaart (KWT). KWT will be analyzed in case two.

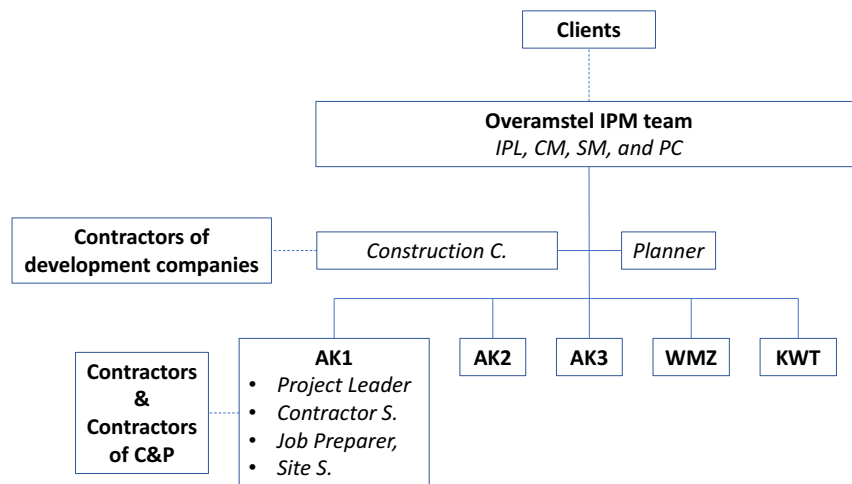


Figure 23 The organization structure of the Overamstel project with sub-project Amstelkwartier 1e fase.

Figure 23 presents that the Overamstel project is managed by an IPM team, according to the interviewee. In the project documents, the Integral Project Leader (IPL) is ultimately responsible for the whole execution. The tasks he has are: managing contacts with the clients and advising them on decision-making, internal communication and cooperation in the Overamstel organization and between the sub-projects, financial control, tender procedures, and communication with other projects outside the Overamstel project.

In the project documents is written what the tasks are of the other IPM team members. The Contract Manager (CM) is responsible for all contract management on program level. The Project Controller (PC) has the task of the integrated financial control, project administration on program level, report on programs progress, the improvement of processes in the different teams, and control of the interfaces between the sub-projects. The internal control of sub-projects is not part of the PC responsibility, but for the project teams. The Stakeholder Manager (SM) in the IPM team is accountable for the communication between the sub-projects, if discussed taking part in residents' meetings, defending the environmental interests in the plans of the sub-projects.

In the interview, the project leader mentioned that there is a Construction Coordinator and Planner for the overarching Overamstel project. The construction coordinator has the task of contacting and coordinating all contractors of the development companies for all sub-projects. Planner had the responsibility to adjust the overall planning for all sub-projects.

The project documents dictate that the project leader has the responsibility over the implementation process in a sub-project. The Project leader has the task to: contact the client on pragmatic business as daily management, coordinating tasks in execution, financial control, tender process for the sub project, advising task on technical issues a planning, and informing and advising the project developer on changes.

According to the project leader other roles in the Ak₁ project team are: Job Preparer, Contract Supervisor, and Site Supervisor. The Job Preparer is responsible to work out the adjusted planes on site. Gathering all information of the building site into the master plan for AK₁. The Contractor Supervisor and Site

Supervisors are responsible for the daily coordinating and managing all activities on the building site, this includes the three types of contractors.

Management in practice

The Project leader states that in the management of the AK1 project team no management model is used, but the style is grown over time. The Overamstel team uses the IPM model without a Technical Manager. The Overamstel IPM team is informed on the main progress of the project but day to day management done by the AK1 project team. When the project leader started, she introduced that all the team members should work one day a week at the site office. This situation created that they could meet when they are working in the same room. Something the project leader consciously asked for the working space from the IPL.

The Project leader says she has total responsibility of the team. When a decision has to be made, every one of the AK1 has to participate. Everybody can explain their point of view and the best solution. With the information of the discussion, the project leader makes a decision. When she started as Project Leader, some responsibility moved from the contract supervisor to her, mainly the extra work contractors had to do. Before the project leader started, the responsibilities were not clear and caused friction in the team because the project leader was not included in the decision. When a decision is interfering with stakeholders or other projects, it is up to the IPM team. Here the CM can approve on assignments because the clients have already approved of the total plan. The project leader tries to keep all the decision as small as possible so she can take them herself.

The work divided to everybody's function, according to the interviewee. Nobody helps each other when his or her own work is done. When a task is finished, it is checked by team members. It also should be checked by a person outside the group with the same function, but due to time constraints, this does not happen. When a team member does not have enough work, he or she takes on work from other projects. Otherwise, they do not make enough hours, and they have their responsibility. This can cause planning problems among the resources when both projects face a deadline.

The way the organization is managed, the Construction Coordinator is causing problems, says the Project Leader. She would include the Construction Coordinator into her team. Now there are situations that communication is poor and he makes a decision with an external contractor without consulting her.

The Project Leader found that her project team works well in her management style. Her way of working does not include actively investing in team members to improve their skills. However, she gives resources time to do that themselves. Given that she was the preparer before becoming the Project Leader, she did a lot of that work herself. Now, she is slowly letting go and giving the current preparer more responsibility. This way of working makes that the team members feel more involved in the team. It also improves the quality of the work.

Division of project tasks

Table 6 presents the answers of the interviewee on the questions of Section E of the interview protocol. Tasks are executed by resources from different groups in the Overamstel organization. Combinations are made by the Project Leader and Integral Project Leader, Job Preparer and Planner, and Contract Supervisor and Construction Coordinator. A couple of tasks are not present in the project, therefore the mark (N.A.). Several activities are executed before the Project Leader joined the AK1 project.

Table 6 Who executed certain project tasks in the Amstelkartier 1e fase project.

	Project task	Executed by
1	Organizing project organization?	Project leader, IPL
2	Project scope determination?	N.A.
3	Report to the client on project progressions?	Project leader, IPL
4	Who is making the planning?	Job preparer, Planner
5	Project document management?	PC
6	Project control on scope, finance, time and quality?	Project leader
7	Reporting of team meetings?	Project leader, Project assistant, Job preparer
8	Conditioning and requirements environment?	Project leader, Job preparer
9	Stakeholder analyses, strategy and communication	Project leader
10	Review of work done by contractor	Site supervisor, Contract supervisor
11	Testing technique design on specifications	Client, Project leader
12	Managing external consultancy	Project leader
13	Program requirements	N.A.
14	Tender process	N.A.
15	Contact with contractor	Contract supervisor, Site supervisor,
16	Contract design	N.A.

Opinion about the IPM model

The project leader says, she never worked in an IPM team. Even though she has no personal experience in working with a IPM team, she thinks the roles are present in every type of project. The Job Preparer now does the contact with the different stakeholders. The tasks are now also clearly defined, and not a lot has to change.

An IPM model is more management level and fewer activities, indicated the Project Leader. There are many meetings because of the division of responsibilities and tasks. She prefers to gather more roles into one person. The role combination creates less discussion. Especially in this project was everything clear and decided. When a project is still in the design face, the IPM model is better. Decision has to be made and then there is substance for discussion. Most of the time it is unnecessary but this can be inexperience says the Project Leader. More contradiction can be of interest and increases the participation of team members.

For the IB it is important to look for every project individually, thinks the Project Leader. The client can play a role in the use of the IPM model in a project but should not be too strict. Leave it up to the project manager if it is an improvement to use the IPM model.

Case 2: Kop Weesperrekvaart

The interviewee is Henberto Remmerts, Project Manager of the KWT project. Mr Remmerts is working for an external project management agency and hired by the IB. He spent one and a half to two days a week on the KWT project. The interview is performed on Wednesday, 23rd of August 2017 at the Weesperstraat office of the IB in Amsterdam.

Project and project performance

The project documents state that the scope of the KWT project is to prepare the building site for the build of 23 city villas and city blocks with over 200 apartments, and the construction of a small inner harbor. The activities include the placement and replacement of cables and pipes and remediation of polluted soil. After the start, the building site is enlarged by adding more building lots. The client chooses a D&C contract with the contractor. The role of the IPM team was to test the work of the contractor, and if necessary, to correct it.

The project started in the end of 2014 and the work on site in the beginning of 2015, sitting to the project manager. The project took two years and it was under a constant time pressure. Building lots had to be ready on time for the contractors, otherwise a fine had to be paid to the lot owners. During the construction activities, the bike connection had to stay open and later on, in the project, the first contractors stated buildings dwellings would make the building site smaller over time. The channel was used for the transport of materials. The budget for the project was in total 5 million Euros. The total project was within budget even though the scope was changed and more work had to be done. There were enough resources available otherwise there was the ability to hire people externally.

According to the project manager, the stakeholders that are present are: the clients G&O and the lot owners, contractors working for the KWT team, contractors for the utility companies, contractors of the lot owners, Prorail, and the city departments as district East who will take over the neighborhood when finished. The contractors of the utility companies are the biggest influence for the rest of the project. The KWT project team could not directly manage the responsible contractors. Also, the client wanted to change the design. For example, the opening of the harbor by adding nature stone, but everted by the project manager to prevent time overrun.

Organization and roles

The KWT sub-project is part of the overarching Overamstel project, as shown in Figure 24. The words in bold are management teams or external parties and words in italic are roles in the organization. Four other projects are part of the total program, these are Amsterkartier 1e fase (AK1), Amstelkwartier 2e fase (AK2), Amstelkartier 3e fase (AK3), and Weespertrekvaart Midden Zuid (WMZ). AK1 is also selected as a case.

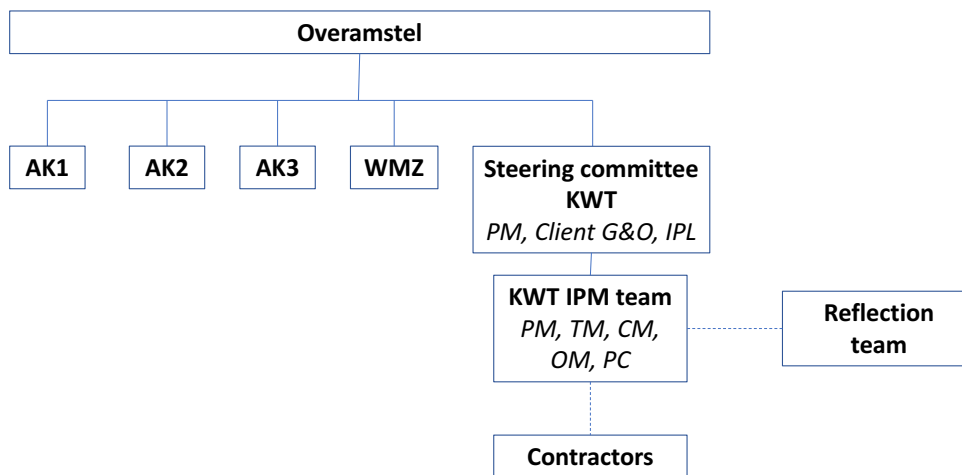


Figure 24 The organization of the Kop Weespertrekvaart sub project with overarching Overamstel project.

As stated in the project documents and by the Project Manager, the organization of the KWT sub-project is shown in Figure 24. The KWT is organized with a steering committee and a KWT IPM team. The steering committee is a consultation of the KWT project manager, the client G&O, and when needed the Integral Project Leader (IPL) of the Overamstel team. The KWT IPM team did all contact with the contractors and stakeholders on site. The project manager had asked two colleagues outside the IB to be advisors to the IPM team, in the form of a reflection team. The reflection team had the task of criticizing the functioning of the IPM team if needed.

The roles in the steering committee are defined in the project documentation. The role of the Project Manager is to manage the controlled execution of the project and report the progress to the client and the IPL. He has the daily management over the IPM team. The client task is to formulate the project scope and make decisions. IPL is overall responsible for the Overamstel project. He monitors the alignment between the five sub-projects and supports the KWT project manager, in particular with the staffing of the IPM team.

The five IPM roles in the project team are described in the project documentation. The role of the Project Manager in the IPM team is to steer the project organization and acts when it does not function properly. He is responsible for overseeing contract control and internal communication. Project Controller (PC) monitors the administrative process of the project and financials for the client. Also, has the PC the task of project secretary. For the Contract Manager (CM), the task is to control the contract and ensuring the use of VISI. He is responsible for possible changes in execution and takes decisions on shortcomings by the contractor. The Technical Manager (TM) has the task to guard design requirements of the contract and defines the risks in the project during execution. Stakeholder Manager (SM) has the responsibility to inform and involve all stakeholders around the project.

Management in practice

In the project team is the IPM model used and not changed, according to the Project Manager. All the responsibilities are divided among the five roles. With the division, the tasks and powers of the resources are taken in mind. The IPM model prescribes a certain distribution, but the Project Manager changed some responsibilities. The TM was also involved in the procurement process of the KWT project. Therefore, the TM had more influence and insight with the stakeholders. The project manager chooses to transfer tasks of the SM to the TM.

The use of the IPM model has made a difference for 100% in decision-making, says the interviewee. All the decisions are made in the IPM team. When having a discussion, everybody can explain their vision. The team has to reach a consensus. For example, a technical problem also influences the environment and contract. It is not possible to oversee the full impact of the decision by one person. The KWT team meet every week for two hours. It took time to get a discussion going and reach consensus within the team. To start a discussion the project manager actively asked open questions and gave everybody a moment to talk.

First, the Project Manager was searching for resources that have experience with working in a IPM team, says the Project Manager. He could not find team members with the right profile, therefore the project manager selected motivated people who want to learn to work with the IPM model. The team functioned well with the IPM model. He invested time in teaching people the new way of management, this was mainly done during the two-hour meetings.

The motivation was an important part of the success of the project team, according to the Project Manager. People were open to learning the new way of management. The chemistry in the group is also an important factor. However, would not be without the IPM model. The KWT was rewarded with project management team of the year 2015. A committee would choose three teams after which the entire IB had the possibility to vote.

Division of project tasks

Table 7 presents the answers of the interviewee on the questions of Section E of the interview protocol. Tasks are divided with the IPM model in mind, but some practical changes are made in the beginning. The Project Manager has an active role in the tender process and contract design, because of a lack in experience in the type of contract used.

Table 7 Who executed certain project tasks in the Kop Weesperrekvaart project.

	Project task	Executed by
1	Organizing project organization?	Project manager
2	Project scope determination?	Client
3	Report to the client on project progressions?	Project manager
4	Who is making the planning?	Contractor
5	Project document management?	Project assistant
6	Project control on scope, finance, time and quality?	PC
7	Reporting of team meetings?	Team
8	Conditioning and requirements environment?	TM
9	Stakeholder analyses, strategy and communication	SM
10	Review of work done by contractor	TM
11	Testing technique design on specifications	TM
12	Managing external consultancy	Project manager
13	Program requirements	Team
14	Tender process	Project man., TM, external advice
15	Contact with contractor	CM
16	Contract design	Project man., TM, external advice

Opinion about the IPM model

The Project Manager says that most people at the IB think that new management tools developed by RWS are only useful on large construction projects. This was the attitude towards risk management and now to the IPM model. The IPM model is only an equivalent to a discussion and consultation structure. The model provides a structure where the competencies are easily defined in every role. In the KWT project, the team had a TM and CM with both other skill sets. This role used to be the contract supervisor who had all the responsibility, now when it is divided people can get better and focus on a certain part.

The use of a full IPM team on smaller projects, for example a maintenance on a small bridge in the middle of nowhere with a standard ARW contract, is too much, according to the project manager. To overcome the problem of overstaffing, roles are combined, but the added value of the model goes away. The project needs all working fields to have enough body for the team. In Amsterdam, all the competencies are present in the projects, so the IB can use the IPM model. However, it is up to the project manager to make the decision and should not be forced on people. In a discussion at the beginning of a project, all aspects of the assignments are discussed and decide what is the best management model to use.

Case 3: Weesperplein

The interviewee is Désirée Barendregt, Integral Project Manager (IPL) and Stakeholder Manager (SM) of the Weesperplein project. During the project Mrs Barendregt was also involved in three other projects. The interview is performed on Wednesday, 26 of July 2017 at the Weesperstraat office of the IB in Amsterdam.

Project and project performance

The scope of the Weesperplein project changed during the design phase, stated by the IPL and project documents. The project started at the end of 2013 with a scope that included an improvement of traffic

flow and safety, higher quality of the public space, and an improvement of the façade of the existing buildings. After elections in the 2014, the city council agreed on a new budget. The budget was changed from 6 million Euros to only 2 million Euros. With the budget cut the scope changed to only facilitating the growth of traffic flows and road safety with no extensive remodeling. The team also research the possibility of an underground bicycle parking next to the metro station was added to the assignment

With the scope change the team had the ability to use the standard maintenance contract of V&OR, says the interviewee. The contract gave a standard price frame for executing work with a pre-selected contractor. The execution of the project was moved forward by the city planner. First, the idea was to wait for the renovation of the metro station under the Weesperplein, but this was reversed. The execution of the project went as planned and was within budget. There were enough resources available otherwise there was the ability to hire people externally.

According to the IPL/SM, the project was simple on a technical level. The challenge was keeping the tram track and roads open for traffic. The cost of managing all the traffic flow costs more than the construction cost. Stakeholders in the WTS project are the client V&OR, the university and college of Amsterdam whom both have their campus close distance to Weesperplein, theatre Caré, inhabitants, and the city district center. The education institutions and district protested over the scope change but lost.

Organization and roles

In the documents, stated that the Weesperplein project stands on its own. In Figure 25 the organization of the project is shown. The words in bold are management teams or external parties. The words in italic are roles in the organization.

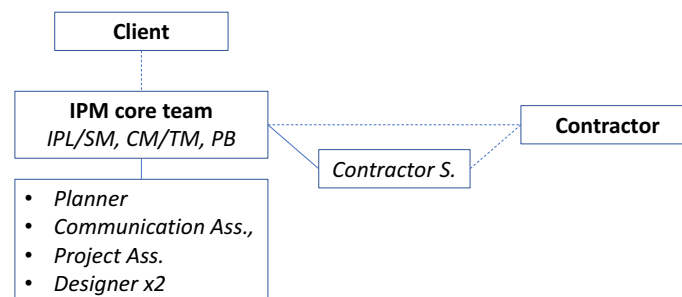


Figure 25 The organization of the Weesperplein project.

As stated in the project documents and by the IPL/SM, the core team consist out of an IPM team with three staff. When the scope changed and the budget was cut, the core team was compressed and went from five to three team members. The role of IPL and SM, and de role of CM and TM were combined. The core team is created to shorten communication lines, increase authority, and reduce process costs. A larger team consisting of five members and assisted the core team. In the outer team a planner, communications advisor, project assistant, and two designers were present. With the use of the standard maintenance contract, the contractor had already a designated contractor supervisor. The contractor supervisor is not part of the project team, but is responsible for the communication with the contractor during the build.

The tasks description of every role is stated in the project documents. The task of the IPL is to create the right organization for the execution of the project. This responsibility includes the review, the cooperation of the team and adjust if needed, and make sure there are enough expert resources. Also communicating

on project progression with the client, is the responsibility of the IPL. The SM has the task to have working relationship with the different stakeholders in the direct neighborhood of the Weesperplein and the communication with the various government agencies. She also has the task of conditioning and traffic management. The TM is responsible for the planning design and design technique. The procurement and contract is the task of the CM. The last role in the core team is PC. She has to task to keep track of the projects progress, control, and risks.

Management in practice

In the project, the IPM model is used but adjusted to the standard maintenance contract, says the IPL/SM. The Contractor Supervisor was used for communication with the contractor on site. The procurement process was managed by the CM/TM. The whole project team focused on stakeholder management and the environment. During every meeting, the IPM team and other team members were all present. The IPML/SM does not work with a hierarchy in the team, meaning everybody could join the discussion.

With the combination of four roles on two team members, it was harder to start a discussion, concluded the interviewee. The PC was the one who had to be critical to keep self-reflection in the team. The planner, who was not part of the core team, caused additional discussion because of his critical attitude. The IPL/SM tries to involve everybody into a decision by asking their opinion. When everybody presented their ideas, a decision was made by the team. She tests the solution by introducing a few scenarios.

At the beginning of the project, the tasks are defined and responsibilities given, according to the IPL/SM. The team was familiar with working in an IPM team because of the early introduction at the DIVV department. Everybody knew what needed to be done and the division of work was done to role and availability of resources. The team meets every two weeks for an hour. Further communication is done with individual meetings of team members. Most members are working on the same floor, meaning they can individually ask team members for input. The work of the team members is checked with an activities list and when needed to be adjusted.

Division of project tasks

Table 8 presents the answers of the interviewee on the questions of Section E of the interview protocol. The division of tasks is done pragmatically and often together. Most of the tasks are executed by one of the IPM team members, but also other roles take on assignments.

Table 8 Who executed certain project tasks in the Weesperplein project.

	Project task	Executed by
1	Organizing project organization	Team
2	Project scope determination	Team
3	Report to the client on project progressions	IPL/SM, PC
4	Who is making the planning	Planner
5	Project document management	Project Assistant
6	Project control on scope, finance, time and quality	PC
7	Reporting of team meetings	Project Assistant
8	Conditioning and requirements environment	IPMr/SM
9	Stakeholder analyses, strategy and communication	IPL/SM, CM/TM
10	Review of work done by contractor	Contract Supervisor, CM/TM
11	Testing technique design on specifications	CM/TM
12	Managing external consultancy	CM/TM & IPMr/OM
13	Program requirements	CM/TM
14	Tender process	CM/TM
15	Contact with contractor	Contract Supervisor

16	Contract design	N.A.
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Opinion about the IPM model

The IPM model was right for this project, according to the IPL/SM. The way of working the IPM model proposed is something she prefers personally. Successful use of the model is most due to the attitude and motivation of the whole team. The attitude has to be open and active. Otherwise, this way of management does not work. By placing responsibility to other team *members*, it is possible to do a better job. In this situation, the team needs resources who want to take that responsibility. If there are no people with the attitude described above the IPL/SM would have used another management style.

The IPM model makes sure the manager of the whole project has less work and can focus on the important parts. This demands trust within the rest of the team. The team members must be capable of carrying the responsibility, if not done so, the model does not work properly. This also applies to the chemistry in the team. When there is no chemistry in the team, the IPM model would be difficult to use. Team members need the motivation to create the chemistry and put in the effort. When they do not work with the IPM model, it is a challenge. Especially, when the team members do not want to take responsibility.

Applying the IPM model at the IB is good, but the way in which is a challenge, states the IPL/SM. Some projects are so small that the IPM model is not worth it. For example, a project team of two people. There always need to be two people in a team to create the role of PC, which can be critical. The model should not be forced onto every project. The team has to decide how to use the mode. At the DIVV teams had to create a team of five meaning the team was unnecessarily large. It is up to the client and manager to decide how the project is managed in the best way.

Case 4: President Allendelaan

The interviewee is Mischa de Vries. Mrs de Vries is the Stakeholder Manager (SM) for the Allendelaan project. During the execution of the President Allendelaan project, Mrs de Vries was also active in three to four other projects. The interview is performed on Tuesday, 1 august 2017 at the Weesperplein office of the IB in Amsterdam.

Project and project performance

The interviewee and project documents state that the initial scope was to replace the wooden deck and brackets of the two bridges with composite. The assets management department choose the new material because it is maintenance-friendly in comparison to wood. If during construction the wooden crossbars would also be in poor condition, they would be included into the assignment. During the tender process contractors advised the project team to include the wooden crossbars into the contract. Eventually the client agreed with the scope change.

According to the project documents and SM there is a design and construction contract used in the Allendelaan project. The contractor that was selected was a collaboration between a composite manufacturer and a sub-contractor who would execute the work. The project site was located in a park with easily excess by road. The total budget for the project is 2,2 million Euros. Construction started in the end of September 2016 and finished in the end of 2016. The project was within budget and planning. There were enough resources available otherwise there was the ability to hire people externally.

The SM says the following stakeholders are present: the assets management department as a client, special committee to assess the look of the composite, inhabitant using the bridge, park management,

and the city district New West. During the preparation, the neighborhood did not agree with the detour that was initially proposed. The detour would go through the park which, in their opinion, was not safe. To mitigate, the contractor made the under passing wide enough for cars and bicycles, this way no detour was needed. Active stakeholder management during execution was not needed.

Organization and roles

The Allendelaan project is standing on its own, according to the project documents and the SM. Figure 26 shows the organization of the project. Words in bold are management teams or external parties. Words in italic are roles in the organization.

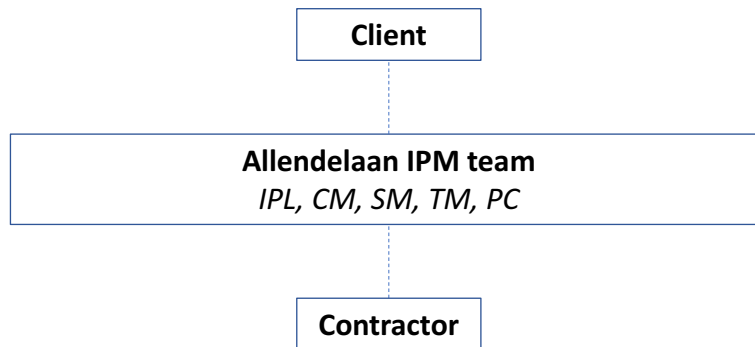


Figure 26 The organization of the Allendelaan project.

For the organization structure the IPM model is used, stating the interviewee. The five roles are filled individually. The Integral Project Leader (IPL) had the responsibility for the overall management and communication with the client. Contract Manager (CM) had the task of communicating with the contractor on site. The stakeholder demands specification for the design and the communication with local residence was the responsibility of the Stakeholder Manager (SM). The Technical Manager (TM) had the task to make the design and test it on the specifications. The control over project progress and financials was the task of the Project Controller (PC).

Management in practice

The SM says that the IPM model is used but in a pragmatic way. The model is a starting point, but responsibilities are not strictly divided among the team members. When something needs to be done the team assesses who is available and experienced. On example of a shift in responsibility is the contract negotiations that where done by the IPL. The design and construct contract is new for the IB and the IPL had more experience as contract manager. When the contracted was signed the IPL step back and gave the responsibility over to the CM.

The team members were familiar with each other, therefor decision-making was easy, stating the SM. They worked at the same department before the merger of the IB. After the contract was signed with the contractor, the IPL moved to the background. Practical decisions were made between the TM, CM, and SM. For example, the decisions of changing the detour was made by the interviewee herself. Other decisions were made by the client of the project. The team officially met every two weeks but bilateral were also happening.

Normally projects of the size of the Allendelaan have a smaller team, says the interviewee. For stakeholders and contractor, it was unclearing who in the project team was responsible for communication. The team agreed that one person became responsible for a certain contact.

For the IPM model to be successful, the team members have to participate in the discussion, stating the SM. In the Allendelaan team the participation of the TM, CM, and SM was high. The group of three always are involved with the different tasks. One of the three had the responsibility, but the tasks were done by the three.

When asked if another organization would have changed the outcome of the project the SM says that it could have been done with a smaller team. But still with an IPM setup. In the old days, everything came together at the project manager with specialized advisors around him or her. In this case, the roles are equivalent providing more dynamic management influencing the way the project is executed.

Division of project tasks

Table 9 presents the answers of the interviewee on the questions of Section E of the interview protocol. There is a very clear division in who executes the project tasks. In the division, the IPM model is used, except task number seven. Task number seven is executed by the Project Assistant.

Table 9 Who executed certain project tasks in the President Allendelaan project.

	Project task	Executed by
1	Organizing project organization	IPL
2	Project scope determination	IPL
3	Report to the client on project progressions	IPL
4	Who is making the planning	PC
5	Project document management	PC
6	Project control on scope, finance, time and quality	PC
7	Reporting of team meetings	Project Assistant
8	Conditioning and requirements environment	SM
9	Stakeholder analyses, strategy and communication	SM
10	Review of work done by contractor	CM
11	Testing technique design on specifications	TM
12	Managing external consultancy	IPL
13	Program requirements	TM
14	Tender process	IPL
15	Contact with contractor	CM
16	Contract design	IPL

Opinion about the IPM model

The use of the IPM model was beneficial to the project, says the SM. When the model is used in the right way, the cooperation provides an overall better project. One disadvantage is a division can cause isolation of roles, this can happen when the teams are too large for the project.

The SM thinks that the IPM model can be used in every project of the IB. The tasks are divided among the roles such a way that fits with the projects of the IB. Efficiency is a point of improvement. The merging of different roles is necessary. Understanding everybody's role, responsibilities, and checking if nothing is forgotten.

Case 5: OMOP Zuid

The interviewee is Linda Weber. Mrs. Weber is the Project Leader of the OMOP Zuid project team. She entered the team in 2012 as Assistant Project Leader and participated in all the years up and including the 2017-2018 programs. Mrs Weber does not work on other projects. The interview is performed on Thursday, 27 July 2017 at the Weesperplein office of the IB in Amsterdam.

Project and project performance

The interviewee tells that the OMOP Zuid 2017-2018 program is a combination of 15 small maintenance projects with budgets of 8.988 Euro to 2,4 million Euro. Maintenance work on asphalt and pavement, removing a large part of the street, but the profile does not change. The list of locations is made by the client. Every two years a new set of streets is selected and handed over to the OMOP Zuid team. Scope change only happens when an extra project is added or removed from the list by the client.

All sub-projects are combined are offered to a preselected contractor, states the project documents and Project Leader. In the contract is a list which prices by area. Creating a clear and pre-agreed price for each assignment. Constant work is done on sub-projects that are at different stages in the process. The location is every time different, but the process stays the same. The sub-projects are meeting the planning and the overall project is within budget. There were enough resources available otherwise there was the ability to hire people externally.

Only the maintenance makes the bureaucracy process less complicated, says the Project Leader. No need of special participation moments of the neighborhood for executing the maintenance activities. There is no political influence once the client has decided on the list of sub-projects and the contract is signed. Stakeholders are mainly the pipe and cable companies. When the team opens the road, it is a good moment to do digging work, although this can cause planning problems. Other influential stakeholders are not present.

Organization and roles

The OMOP Zuid project is standing on its own, according to the project documents and the project leader. Figure 27 shows the organization of the OMOP Zuid project. Words in bold are management teams or external parties. Words in italic are roles in the organization.

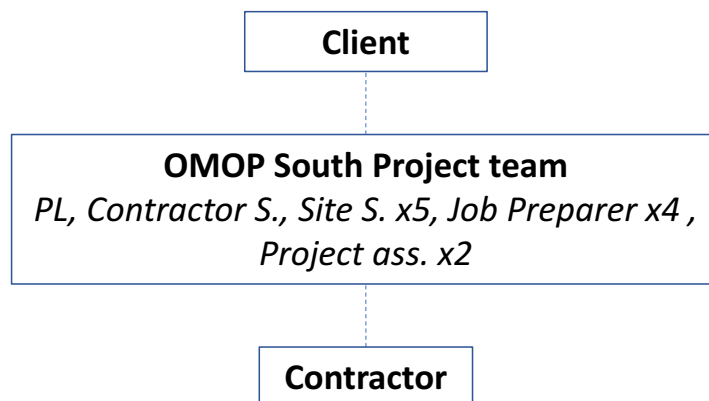


Figure 27 The organization structure of the OMOP South project team.

The project team has around 13 members, but there is a constant change of resources, says the Project Leader. As is shown in Figure 27 the team has a Project Leader, Contractor Supervisor, five Site Supervisors, four Job Prepares, and two Project Assistants. Almost half of the team is hired from external engineering firms.

The task of the Project Leader is good cooperation in the team good, overall planning, and communication with client and stakeholders, says the interviewee. The Contractor Supervisor is managing all the Site Supervisors and oversees the project in execution. The Site Supervisors have contact with the contractor

on site. Job Prepares work out new assignments and make the detailed planning. The Project Assistants support the project organization and the Project Leader.

Management in practice

No management model is used in the project team, says the project leader. The working process improved over the years. Most team members work for a longer period at the OMOP Zuid team. The experience gained remains in the team. The interviewee started in the OMOP Zuid team in 2012 and worked there ever since. In 2016, she became the project leader, and her personal belief is working in an open and social environment. The Project Leader is responsible for the total project and delegates tasks down the organization to the different roles.

In the project, not many decisions have to be made, according to the interviewee. The scope defined in contact with little complexity. Decisions are quickly out of the scope and up to the client to decide. When discussions take place, the project leader does not force them deliberately. The team works in the same office. They are less than 20 meters apart when something needs to be discussed, people do it on the work floor.

Team members have to be open about taking over work from each other when someone is busy, tells the Project Leader. Work is divided mutually among the team members, and no rules are needed. The Job Prepares start at every sub-project and work out the plan together with the contractor, Contractor Supervisor, and Site Supervisor. The Contractor Supervisor and Site Supervisor take over and manage the working site with the contractor. Sometimes there is a work overload and causes friction in the team. It is up to team members to make clear, and the Project Leader does not interfere. The different tasks are checked by either a colleague or by the Project Leader. The total work is reported to the client and reviewed by a project controller from the Project Team South.

The Project Leader thinks, the way of managing the team is working for everybody. Some team members are new and not used to work in a project environment. The Project Leader actively worked with team members to adapt their way of working. For example, the new Project Assistant was asked to make a working structure for herself. This means the Project Leader does not have to tell her what to do. The time the project leader invests in learning team members her way of working pays off eventually.

Division of project tasks

Table 10 presents the answers of the interviewee on the questions of Section E of the interview protocol. Many tasks are executed by the Project Leader. Only tasks during the execution of a project are done by other roles.

Table 10 Who executed certain project tasks in the OMOP Zuid project.

	Project task	Executed by
1	Organizing project organization	Project leader
2	Project scope determination	Project leader
3	Report to the client on project progressions	Project leader
4	Who is making the planning	Project leader
5	Project document management	N.A.
6	Project control on scope, finance, time and quality	Project leader
7	Reporting of team meetings	Project assistant
8	Conditioning and requirements environment	Job Preparer / Site Supervisor
9	Stakeholder analyses, strategy and communication	N.A.
10	Review of work done by contractor	Contract Supervisor / Site Supervisor

11	Testing technique design on specifications	Team
12	Managing external consultancy	Manager of Project team East
13	Program requirements	N.A.
14	Tender process	Project leader
15	Contact with contractor	Contractor Supervisor
16	Contract design	Project leader

Opinion about the IPM model

The Project Leader thinks it is hard to adjust the organization of the project team to the IPM model. The way of working now is improved over the years. The roles the IPM model are already placed in other positions. For example, the Site Supervisor is responsible for contacting the utility companies. With the IPM model, there is more division in the team. She thinks It can work in larger groups, but in this case, it is small with more standard work. She does not know if it would benefit to divide responsibility.

The IPM model offers the Project leader more time to focus on management of the team, says the interviewee. Getting the OMOP Zuid team at that stage will cost a lot of time. There are team members who can learn a new role, but it would task to deliberately shedding functions. With the division of responsibility, the communication is harder what is bad for simple projects.

Projects that are interesting to use the IPM model are larger and on one location, thinks the project leader. There is more uncertain so more to talk about. In this project, everything is decided. When all sides have to be taken into account, and a considered decision has to be made the IPM model is right. The way the IB introduced it now is good. Let it up to the manager and team what is useful for the project.

Case 6: Kinkerstraat Oost

The interviewee is Ferry Mulder. Mr Mulder is Project leader of the Kinkerstraat Oost project and also involved in five to eight other projects during the execution. The interview is performed on Thursday, 24 of August 2017 at the Weesperstraat office of the IB in Amsterdam. The project is finished at the moment of the interview.

Project and project performance

The scope of the project is to change the layout of the street including the tram track, says the interviewee. The car-parking facilities were removed and the one-way street is lifted. The space that is made available with the changes is used for a wider sidewalk and bike lanes, bike parking and more plantation. Additionally, maintenance work was performed on the tram track, replacing two stops. During the construction activities, the cables and piping companies had to be coordinated to execute their work, to minimize the inconvenience of residents. At the start of the project, the site was increased by adding a crossroad.

The whole project took seven months to execute and had a budget of around two million Euros, according to the Project Leader. During the construction, all activities in the shopping street could not be affected. The traffic flow was not impaired, including the tram track. Shops had to be available for costumers to minimize financial damage of the entrepreneurs. The project schedule was tight and a constant time pressure was present. Other projects in the neighborhood that affected the Kinkerstraat project where the Leidseplein and Bilderdijkstraat. The site itself was small and had to be taken into account while planning. In the end, the project was finished on time and within budget. There were enough resources available otherwise there was the ability to hire people externally.

Project Leader states that the stakeholders that were present are: cables and piping companies, public transport company, shop and bar owners, shoppers, residents, and the board of the city district West. The involvement of the entrepreneurs is high with political contacts. To be able to meet the deadline and prevent unsafe situations, a decision was made to close the tram track twice in the weekend.

Organization and roles

The Kinkerstraat Oost project stands on its own, says the Project Leader. Figure 28 shows the organization structure. The words in bold are the project team or external stakeholder. Words in italic are roles in the project organization.

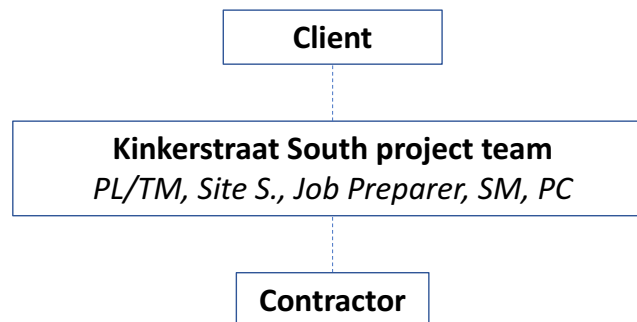


Figure 28 The organization structure of Kinkerstraat Oost project team.

The role of the Project Leader is combined with the TM. He is responsible for the cooperation with the project team and communication with the client. Additionally, he assesses the plans on technical specifications during the design and changes during construction. The Site Supervisor was involved with the design face and during execution communicating with the contractors on site. Job Preparer had the task of making the contracts and tender process. When construction activities started, he was no longer present in the team. The Stakeholder manager was responsible for communication with all the stakeholders in the neighborhood and designing a phased plan to minimize inconvenience. The role of the project controller is to keep track of the planning, budget, and quality of the overall project.

Management in practice

No model is used but organized with experience on the situation, says the Project Leader. The experience of team members is vital in the amount of responsibility to give. A model does not take the person knowledge into account. In a smaller project, the team has to stay small, and the Project Leader has to be active and taking on tasks in the group. The Project Leader always has to overall responsibility for the project. He divided the functions that need to be done and supervised how a team member handles the assignment. When a person has the urge to take on more responsibility, and other do not, the Project Leader listens and steers.

Decisions are made by the project team, according to the interviewee. Team members with responsibility present solutions. The solutions are weighed and, partly or as a whole, included in the solution. The solution is not perfect in any way but the team members try to make the most favorable decision. In the situation, a decision can be made with fewer team members, it desirable by the Project Leader. When the decision is out of scope, the client is informed.

The tasks are divided among the roles in the team, but if needed work is shifted, says the Project Leader. In the case of work overload and time pressure, tasks are redesigned. When work is finished, it is checked

by team members. The contract is reviewed by an external advisor. The team did not work at the same spot but had a meeting ever month. In the case of a deadline, the sessions were increased.

In the management style, not all procedures flow, but the project is finished, and the client is happy, says the interviewee. With another management model, the same result was met. This is because of the slim solution possibilities of the project. There are a lot of rules which eliminates many possibilities. A large organized IPM model, with the IPL above the team only steering, is not adding value. A UAGVC contract also does not facilitate this because the market can just offer the same solutions.

Division of project tasks

Table 11 presents the answers of the interviewee on the questions of Section E of the interview protocol. As Project Leader and TM, the interviewee is involved in high number of the tasks. Tasks are most of the time done by two roles.

Table 11 Who executed certain project tasks in the Kinkerstraat Oost project.

	Project task	Executed by
1	Organizing project organization	Project Leader/TM
2	Project scope determination	N.A.
3	Report to the client on project progressions	Project Leader/TM
4	Who is making the planning	Project Leader/Tm, Contract S. & SM
5	Project document management	N.A.
6	Project control on scope, finance, time and quality	Project Leader/TM
7	Reporting of team meetings	Team
8	Conditioning and requirements environment	Project Leader/TM, Job Preparer
9	Stakeholder analyses, strategy and communication	SM, Project Leader/TM
10	Review of work done by contractor	Contract S., Site S.
11	Testing technique design on specifications	Job Preparer
12	Managing external consultancy	Project Leader/TM
13	Program requirements	N.A.
14	Tender process	Project Leader/TM
15	Contact with contractor	Project Leader/TM, Site S.
16	Contract design	Job Preparer

Opinion about the IPM model

The IPM model would not be of use, says the Project Leader. The five roles of the model are too heavy. There are possibilities to combine roles. The division that the model proposes is now is not consistent with practice. For example, the in the model, the task of coordinating of the environment and stakeholder management plan are the responsibility of the same role. In this project, the Job Preparer and TM made the conditioning and the stakeholder management plan is created by the SM and the Project Leader. Therefore, the TM knows the design and the SM only the accessibility of the neighborhood. Those roles do not connect.

It is possible to make an IPM model 2.0, says the interviewee. Now IPM model works perfect for a project with a budget of 300 million Euros, but the IB is executing plans of 1.5 million Euros. The management costs will be too high for the size of the project. A balance needs to be met between the scope of the project and the management team. For a project with regular work that is only on street level, another model with just a few people and combined roles is needed.

The way to use the model should be flexible thinks the Project Leader. Some experience determents the responsibility given by the project leader. Decisions made in discussion with the people carrying

responsibility. Important is the goal of the project, and procedures are details. For every project, a different model is preferred. A hard division over project characteristics is not possible. For example, a plan can be short in time but very intensive and complex while others go on for years and are simple. Or a street has a costly design with natural stone and is easy to manage, or a complex planning is needed for a relatively low-cost project.

Case 7: Jan Luijkenstraat

The interviewee is Onno Man, Project Leader of the Jan Luijkenstraat. During this project, Mr Man was attending four other projects. In the other projects, the interviewee has different roles besides Project Leader. The interview is performed on Wednesday, 20 September 2017 at the Weesperstraat office in Amsterdam.

Project and project performance

The scope of the project is the renewal of the pavement and asphalt, and adjust the design of the street to general style for the city of Amsterdam, stating the project documents. In the plan, the asphalt will be replaced by vowels. Car parking will be adjusted to be in line with the rest of the street, and the threes will be replaced. During the construction activities, the cables and piping company is coordinated in their work.

The total project took a year to finish, including a three-month delay due to the external contractor, says the Project Leader. There was no tight schedule with time pressure. The budget was 600.000 Euros and no cost overrun occurred. There was enough space on the building site for all the activities, and the location was easy to access. There were enough resources available, otherwise there was the ability to hire people externally.

Stakeholders in the Jan Luijkenstraat are the residents and entrepreneurs, cables and piping company, and the client City District South, according to the interviewee. Three months delay was caused by the renovation of the main gas pipe that took longer than anticipated. Also, the neighborhood protested about the removal of the threes in the street. The trees were said to have sentimental value to the residents of the Jan Luijkenstraat. To overcome this struggle, money was made available to select bigger threes from Germany.

Organization and roles

Figure 29 shows the organization of the Jan Luijkenstraat project is on its own, stating the project documents. Words in bold are management teams or external parties. Words in italic are roles in the group.

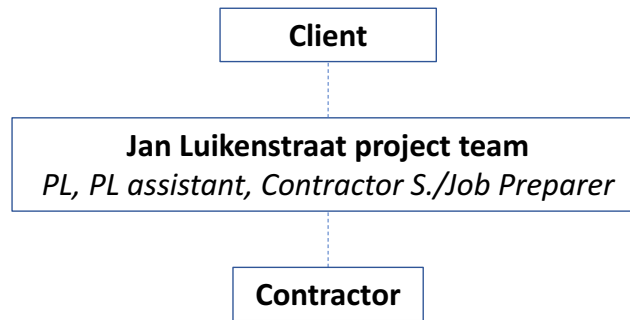


Figure 29 The organization structure of the Jan Luijkenstraat project.

As seen in Figure 29 consist the project team of three members, according to the Project Leader. The Project Leader takes on several roles and is supported by the Project Leader Assistant, and the Job Preparer also has the function of Contractor Supervisor during construction. During the design and construction process, people from outside the team are asked to perform different tasks. In the design phase, a Planner, a Technical Designer, and a Calculator were asked to complete several assignments. During construction, a Communication Advisor was asked to help in communication with the neighborhood.

Management in practice

The IPM system is used as a starting point but in a realistic way, says the Project Leader. The division is made at the start of the project in a starting document. Using the experience of the interviewee to appoint the different tasks that are needed for the project. In this process, the Project Leader tries to keep the team as compact as possible. One person has multiple roles, so was the Technical Designer also responsible for the contract. The Project Leader Assistant took over a lot of work on practical level. The Contractor Supervisor was often present on site and took on the role of daily communication with the neighborhood. The different tasks of the IPM model are divided into the team members that are present or external personnel.

The decisions are made by the project team, stating the interviewee. In a discussion, every member offers an opinion and a democratic decision is made. There are situations where the Project Leader overrules the decision made by the team, but only when external interests are not included. The team members work at the same office and communicate on a daily basis. An official meeting is scheduled every two weeks.

The adoption of the management style is a pragmatic one, according to the Project Leader. The Jan Luijkenstraat is a simple project with a clear scope. Stakeholder management of the neighborhood was important. Therefore, a person was needed who took an active role. The Contractor Supervisor could take the role of stakeholder manager, because of its open personality. A Stakeholder Manager who is officially assigned to this role is unnecessary, demands more communication in the team, and is costly. When roles are combined, the considerations are made by the person itself.

Division of project tasks

Table 12 presents the answers of the interviewee on the questions of Section E of the interview protocol. For most tasks, the Project Leader was involved. The task of stakeholder management is divided among several team members.

Table 12 Who executed certain project tasks in the Jan Luijkenstraat project.

	Project task	Executed by
1	Organizing project organization	Project Leader
2	Project scope determination	Client, Project Leader
3	Report to the client on project progressions	Project Leader
4	Who is making the planning	Planner
5	Project document management	Project Leader Ass.
6	Project control on scope, finance, time and quality	Project Leader
7	Reporting of team meetings	Project Leader Ass.
8	Conditioning and requirements environment	Project Leader, Contractor Sup.
9	Stakeholder analyses, strategy and communication	Project Leader, Communications ad., Project Leader Ass., Contractor Sup.
10	Review of work done by contractor	Contract Sup.
11	Testing technique design on specifications	Contract Sup.
12	Managing external consultancy	Project Leader
13	Program requirements	Team
14	Tender process	Project Leader
15	Contact with contractor	Contractor Sup., Project Leader
16	Contract design	Technical Designer

Opinion about the IPM model

The IPM model would not be useful in this project, thinks the Project Leader. The placement of managers would make it more complicated. The Project Leader takes all the roles and divides the tasks among the team members. Participation of team members is immediate, which delivers better integration and cooperation.

The benefit of the IPM model is on big projects, states the interviewee. The division makes sure all points are discussed but you need professional people in every role, people who know how to communicate and know how to prevent islands from forming in the team. The project manager has the responsibility to continue to monitor cohesion. In a smaller project, the Project Leader is part of the team who takes on several tasks, creating the cooperation in the team himself.

The use of the IPM model in an IB projects is up to the project manager itself, says the Project Leader. Every project is different, and considerations have to be taken on the focus points. The decisions can happen in a discussion with the client or the Team Leader who took on the project. There is not a clear division on the use of the IPM model or not. It has to be decided in a dialogue where all the values of the municipalities are included.

Case 8: Watergraafsmeer

The interviewee is Mark Brattinga. Mr Brattinga is Integral Project Manager (IPMr) of the Watergraafsmeer project. The tasks of Mr Brattinga are to manage the Watergraafsmeer pilot project and to bring IPM further into the IB organization. He is working for at the IB for four months at the moment of the interview. Mr Brattinga worked with the IPM model at a Water board, before moving to the IB. The interview is performed on Wednesday, 16 of August 2017 at the Weesperstraat office of the IB in Amsterdam.

Project and project performance

The project documents state that the scope is to an integrated approach to maintenance, replacement, and refurbishment of the street, the pipes and cables. On different places in the Watergraafsmeer, an intensive maintenance plan is made with the three clients. At the moment of the interview, the areas are

Middenmeer Noord and Linaeuskade, Betondorp area one, two, and three, and Don Bosco Middengebied. For every street, the pavement is replaced, but the design was not changed immediately. In some cases, changes are made to the profile of the road. The number of car and bike parking spaces stays the same. The placement of underground waste containers is incorporated with the maintenance work.

The overall timespan of the Watergraafsmeer is four to five years, says the IPMr. Every sub-project has a planning of two to three years. With the developments, more sub-projects will be added in the future, extending the duration of the overarching project. The budget of every sub-project will be discussed with the three clients. At the moment of the interview, the investment of the municipality for the Watergraafsmeer project is 6,526,730 Euro. Locations are easy to access, and the streets are wide enough for the building activities. There were enough resources available, otherwise there was the ability to hire people externally.

Stakeholders that are present are: residence, social housing cooperative, and the three clients. The organization of the project places the cables and piping companies in to organization as clients. The activities of the three clients are the responsibility of the project team. In the contract, all the activities of the clients over a larger area are combined into one contract and put out for tender.

Organization and roles

The organization of the Watergraafsmeer project is shown in Figure 30. Words in bold are management teams or external parties. Words in italic are roles in a group. Functions with an asterisk are vacant. At the moment of the interview, the Watergraafsmeer is an overarching program of three sub-projects, states in the project document. The three clients are represented on the Steering Committee. The steering committee is advised on new projects by the coordination team assets. The Watergraafsmeer project is managed with a core IPM team. Every sub-project has its project team.

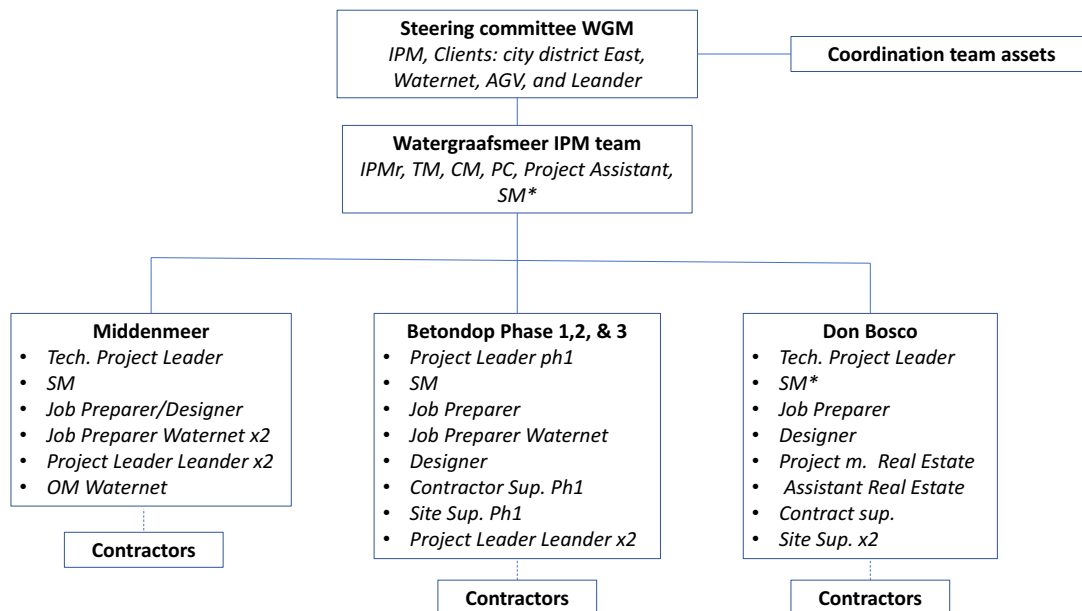


Figure 30 The organization structure of the Watergraafsmeer project with sub-projects Middenmeer, Betondorp, and Don Bosco.

The role of the IPMr is overall responsible for the project, says the IPMr. He is active in the IPM team and from there manages the whole project. The IPMr is also a member of the Steering Committee where he communicates with the three clients. The core team is a full IPM team with an additional Project Assistant.

At the moment of the interview, there are searching for a Stakeholder Manager (SM). The intent to impose all responsibility of the IPM model on the five roles in the team. All functions are present in the IPM team to realize a construction project. In these groups, there is a practical approach.

Management in practice

Attempts are being made to apply the IPM model in a pure form, says the IPMr. Move all responsibilities to the core team and divided them among the IPM roles. At the moment, the Technical Project Leaders of the sub-projects take responsibility. The idea is to move that responsibility up to the IMP team members slowly. It is an ongoing process to find out how the sub-projects are best steered from the IPM team.

The sub-projects have the same phases, states the interviewee. In every stage, the focus is on a specific role of the IPM team. First, the Contract Manager (CM) is in the lead in the tender process and strategy. Second, during construction, the Technical Manager (TM) and Contractor Supervisor are leading. This thought can be used in steering the sub-projects. A team member with an IPM role is placed in a sub-project team during the phase he or she should have the lead. The practical work takes place in the sub-teams, and the IPM team supports. When a decision has to be made, it is done in the IPM team.

The sub-project teams are used to work with a Project Leader that can make decisions, says the IPMr. Now that Project Leader has to report to the IPM team, more focus has to be on delegating a decision to the IPM team. The cooperation idea of the IPM model can be used. The IPM team will have a discussion and make there a weighted choice. At the moment of the interview, there are still ongoing decisions to be taken in the sub-teams.

At the start of the pilot, the IPMr demanded that the team members of the core team can spend 50% of their time on this project, states the interviewee. If team members had multiple other projects, their efficiency would go down. Now, they work solely on the Watergraafsmeer project and shift between internal tasks. More time can be invested in domestic issues that are not considered. The knowledge the team members gain can be used in other projects later on. Also, more time can be invested in the meetings. The IPM team meets every week for one and a half to two hours. Besides project-related issues, personal inquiries are also discussed. The more extended team meetings, the more it increases the spirit of the team.

The tasks division will start at the IPM team, says the IPMr. Here, the assignments are divided with the IPM role in mind. The role who is responsible will include the relevant resources from the sub-team. For example, there are situations that the IPMr is contacted by a Contractor Supervisor but in such a case the communication has to be done with the TM.

The Watergraafsmeer project has enough work for the size of the team, according to the interviewee. If that is not the case, the team will come to a standstill. Procedures will be done more efficiently over time. To facilitate the team with enough work the borders are redrawn, adding more tasks to the IPM team. Also, the IPMr actively approaches the Coordination Team Assets to stimulate decision makers to sign off on more projects. When everything is finished in the Watergraafsmeer area, the team will slowly dissolve again and the team member will disperse into the IB organization.

Over time, the key figures in the IPM team will learn to operate in this type of organization, thinks the IPMr. The complexity increases, but there is more time to work on the project. The IPM team slowly takes

over the role of the account holder for that area. External stakeholders, as Leander and Waternet, that cost a lot of time in coordination are included into the project as a client. With the combination of multidisciplinary sub-projects, it is interesting for contractors to be more creative in executing the work, using the innovation of the market. Overall will the projects be cheaper than running them one by one. The organization allows the team to invest time for obtaining subsidies.

Division of project tasks

Table 13 presents the answers of the interviewee on the questions of Section E of the interview protocol. The tasks are divided among the IPM team. Only the task number 15, contract with a contractor, is executed by the Contractor Supervisor and CM.

Table 13 Who executed certain project tasks in the Watergraafsmeer project.

	Project task	Executed by
1	Organizing project organization	IPMr
2	Project scope determination	Team
3	Report to the client on project progressions	IPMr & PC
4	Who is making the planning	PC
5	Project document management	PC
6	Project control on scope, finance, time and quality	PC
7	Reporting of team meetings	Team
8	Conditioning and requirements environment	TM & SM
9	Stakeholder analyses, strategy and communication	SM
10	Review of work done by contractor	CM & TM
11	Testing technique design on specifications	TM
12	Managing external consultancy	TM
13	Program requirements	Team
14	Tender process	CM
15	Contact with contractor	Contractor Sup. & CM
16	Contract design	CM

Opinion about the IPM model

The IPM model can always be modified, thinks the IPMr. Every project has other focus points. For example, a renovation project of a water purification plant that located on edge for the city. The technical aspects of such a project are high, but the stakeholder management not. In this case, the decision can be made to remove the role of SM and place that responsibility on the other functions. The adjustments can also be made in projects of the IB.

A disadvantage of the IPM model is that the team can be oversized for the project, stating the interviewee. If the project is a small matter, the model does not work. The effectiveness decreases and the organization become sluggish. A project with a budget of 50,000 Euro is better described as a task. A task is better executed by one person. The model asked for a specific size of a project.

The size of the project can modify by combining projects, says the IPMr. For example, executing a street maintenance project on their own is a one-man job. The client has to track all the small projects separately. When dozens of streets are combined, it becomes more complex. There is a challenge to manage these types of projects at higher abstraction level, relieve the client and the ability to implement improvements in the project process.

The IPM model is useful for the IB organization, according to the Interviewee. In the past, the municipality was struggling on an organizational level. Projects in the city are challenging to execute with the active

residence which quickly seeks publicity. Project teams need a proactive attitude and anticipate possible problems. Another point is making use of the market with their innovations. Creating contracts that facilitate space for the contractor. The IPM model provides a structure for people to gain experience in a particular field. The knowledge that promotes the IB organization to be more professional.

Appendix E: detailed explanation of cross cases analyses

The structure of the cross-cases analysis is similar to the single cases analysis in the Chapter 4 (Section 4.1.4). The analysis per cases is divided in four parts: First, the project scope and performance. Second, how the organization and roles of the project has been established. Third, how is the project management in practice in combination with the task division. Lastly, the project managers and their view on the IPM model is compared. The cross-case analyses of the first three parts is executed in three ways. First, an overall cross-case analyses. Comparing all the projects with each other. Second, an assessment between the projects with the same client. Lastly, with the answer on sub-question 2, a comparison between the cases that use the same management structure. Here case 1 is compared with case 8, and case 2 with case 4. The opinion of every interviewee presented in Section 0 and only compared overall.

Project and project performance

In this Section, the eight projects characteristics and their performance will be compared with the data of Chapter 4. Table 14 show to cross-case analysis on budget, assignment, scope definition, multiple construction activities, scope change before or during execution, importance of planning, complications caused by the location, resources problems, active stakeholder management needed, external contractors on site, project delivered on time, and within budget.

Table 14. The cross-case analysis of project characteristics and performance.

# Question	Case							
	1	2	3	4	5	6	7	8
1 Client	G&O	G&O	V&OR	V&OR	C.D.	C.D.	C.D.	C.D./*
2 Budget (mil. euro)	?	5,00	2,00	2,20	6,90	2,00	0,50	6,50
3 Type of Assignment?	Dev.	Dev.	Main.	Main.	Main.	Ref.	Ref.	Main./Ref.
4 Scope defined to final design at start?	no	no	yes	yes	yes	yes	yes	yes
5 The project is multidisciplinary?	yes	yes	no	no	no	no	no	yes
6 Scope changes before execution?	yes	yes	yes	yes/no	no	no	no	no
7 Scope change during execution?	yes	yes	no	no	no	no	no	no
8 Planning of importance?	yes	yes	no	no	no	yes	no	no
9 Location of influence?	yes	yes	yes	no	no	yes	no	no
10 Difficulties obtaining resources?	no	no	no	no	no	no	no	no
11 Active stakeholder management?	yes	yes	yes	no	no	yes	yes	yes
12 Dependent of external contractors?	yes	yes	no	no	yes	yes	yes	no
13 Project finished on time?	no	yes	yes	yes	yes	yes	no	no
14 Budget under control?	no	yes	yes	yes	yes	yes	yes	?

* external client: Waternet and Leander

Overall

With Table 14 the eight cases are compared on project characteristics and performance. Case 1 the overall budget is unknown. The rest range between 0,5 million Euro (case 7) to 6,9 million Euro (case 5). Case 5 consist of 15 sub projects with budgets of 8.988 Euro to 2,4 million Euro. Case 8 is also a total budget of three sub projects. Three types of assignments are executed, development (Dev.), maintenance (Main.), and refurbishment (Ref.). It can be seen that the scope of case 1, 2, and 8 are multidisciplinary. Only the cases with G&O as client (case 1 and case 2) have uncertainties, resulting in changes during construction. Whereas the other six projects are formulated and do not change during execution. Planning becomes important when external stakeholders are negatively influenced by a project. For case 1 and case 2 a deadline had to be met for external contractors to start building. Case 6 the shops were affected by the project, so time was of the essence. Location where influencing the project when high number of activities

take place at the location (case 1 and case 2), or when the project is at busy point in the city, as can be seen by case 3 and case 6. No case had problem with obtaining resources for their projects. Active stakeholder management is not needed at case 4 and case 5. Case 4 is located in a park with no inhabitants close and case 5 is road maintenance without bureaucratic processes needed. External contractors are present in most cases (1, 2, 5, 6, 7) and all the time the cables and piping company is present. Case 8 takes care of the external contractor by incorporating the stakeholder as client into the project. Most projects perform well on budget and time, except case 1, 7, and 8. Case 1 has no overview on budget and from 2012 had to endure several delays.

Client

The projects of case 1 and case 2 are very similar, as seen in Table 14. At the start of the project the scope was not defined to a final design and multiple constructions activities have to take place. Scope changes occurred before and during the execution. Both had a planning that had to be met, otherwise fines had to be paid. During construction, more contractors were active on site and eventually residents are present. Planning was hard because of external stakeholders that had to be supervised. When, comparing the performance a difference is noticeable. The performance of case 1 is lacking due to planning and budget problems, showing there is no overview and control over the project. Whereas, case 2 performance is good, finished on time and within budget.

The scope of case 3 and case 4 are first different in assignment but after the scope change of case 3 they both became a maintenance project with a clear scope (Table 14). Budget are similar with 2 million for case 3 and 2,2 million for case 4. Planning did not have influence in both projects. The location of case 3 was challenge, where case 4 was not. Both projects did not have to cope with external contractors. The performance of the two cases were good.

The projects of case 5 to case 8 show similarities in Table 14. All road maintenance or road refurbishment projects and the scope is defined. Case 5 and case 8 combine multiple sub projects and let them be executed by one contractor to obtain a better price. Case 8 is multidisciplinary because of the incorporation of the cables and piping company. Location and planning are for the most cases not affecting the project. Only case 6 has a challenging location and planning due to the shops in the street. The cable and piping company influencing every project as external contractor. Except case 8 who included the stakeholder as client. Case 7 and case 8 changed the planning. Case 7 had complications due to the cable and piping company, whereas case 8 had to adjust the planning because resources had to get used to the new way of organizing.

Management structure

Comparing case 1 and case 8 the scope of projects is different, shown in Table 14. Case 1 has an undefined scope where multiple activities have to be executed. Case 8 is a defined and consist of three sub projects with multiple activities, because of the incorporation of the cables and piping companies. Case 1 have to cope with changes during construction whereas case 8 the projects the final design is executed. Case 1 has a tight planning with consequences if not met. Case 8 the planning is not of influence for the course of project. Case 1 location is affecting the process here as case 8 does not. External stakeholders are present at case 1 and have a large effect on the project. Case 8 solves this by including the stakeholder into the project as client. Both projects had to change their planning. Difference is in meeting the budget. Where case 1 does not have control over expenditures, case 8 is well managed.

Case 2 and 4 are different projects (Table 14). Whereas case 2 is development project with scope changes before and during execution. Case 4 is a clear maintenance project with no changes at all. The planning

was of importance to case 2 and not for case 4. The location of case 2 is creating complications whereas the location of case 4 not. Only external stakeholders had to be coordinated for case 2. Performance of both cases was good.

Organization and roles

This Section a cross-case analysis will be performed on how the organization of the project is created and what roles are present. In Table 15 the data of the case studies in Chapter 4 is presented on the use of a management model, whether the model is adjusted in advance, is the organization described in documentation, are there multiple groups in the project organization and their responsibilities defined, and are roles mentioned and their tasks described.

Table 15 The cross-case analysis on the documentation of organization and roles.

#	Question	Case							
		1	2	3	4	5	6	7	8
1	Management model used? Which?	IPM/no	IPM	IPM	IPM	no	no	no	IPM
2	Model adjusted before execution?	yes	no	yes	no	n.a.	n.a.	n.a.	yes
3	Organization described in documentation?	yes	yes	yes	no	yes	no	no	yes
4	Multiple groups in the organization?	yes	yes	yes	no	no	no	no	yes
5	Responsibilities of groups described clear?	yes/no	yes	yes	n.a	n.a.	n.a.	n.a.	yes/no
6	Roles described in documentation?	no	yes	yes	no	yes	no	yes/no	yes
7	Tasks of roles defined in documentation?	no	yes	yes	yes/no	no	n.a.	no	no

Overall

Comparing all eight cases in Table 15, five of the eight cases use the IPM model in their project, only case 5, 6, and 7 do not. Case 1, 3, and 8 adjust the model before the project start, in contrary to case 2 and case 4 who tent to use the model in the original form. Case 1 the overarching core team uses the IPM model but the AK1 team does not. Case 1, 2, 3, 5, and 8 describe the organization of the project in their documentation. Here has case 1 to 3 and case 8 multiple groups in their organization. Only case 2 and 3 clearly describe the responsibility of the different groups in their documentation. In case 1 the responsibility between the groups is unclear. For case 8 the lower half of the organizations poorly described (Page: 95). The roles present in the organization are not documented in case 4 and case 6. Cases 5, 8, and to a lesser extent case 7, has a description of roles but no tasks assigned.

Client

Comparing case 1 and case 2 in Table 15, who are both a sub project of the overarching Overamstel project. Both are using the IPM model but in a different way. Case 1 is managed by an overall IPM team, whereas case 2 management with IPM team in its core. Both describe to organization and have multiple groups. Only case 2 clearly describes the responsibility between the groups. In both documentation roles are described, although in case 1 the roles in the sub team itself are not.

Case 3 and case 4 both use the IPM model but case 3 adjusts the model due to scope change in the project (Table 15). Further description of the organization and roles is not present at case 4. For case 3 the whole organization is described in detail. There is a core group with an outer support group. The responsibility of the core group is defined in the documentation. Also, the roles and their tasks are defined in case 3.

In case 5 to case 8, only case 8 uses the IPM model in their organization (Table 15). Case 5, 6, and 7 are organized without a model. Only case 5 describes the organization of sub projects. In the three cases, there is one project team operating. Roles are described in case 5 and not in case 6 and 7. The tasks of every role are not mentioned in the documentation of case 5. Case 8 adjusts the model by using it in their

core team that manages the three sub teams. The organization with the different groups is described in case 8 but their exact responsibilities not. This is also applicable for roles in the project. They are all mentioned but not defined what the exact tasks is over every role.

Management structure

Comparing case 1 and case 8 in Table 15, there are mainly similarities. Both use the IPM model in an adjusted way. In the core team of the overarching project a IPM team is working and managing the steering the sub projects. The organizations are documented and both have multiple groups in the organization. Although, case 1 has some description over responsibility division it is not clearly stated in the documents. Case 8 does not have a description on responsibility. One difference between the two cases it that case 8 define every role present in the project, whereas case 1 does not describe the sub teams. Both cases do not describe the tasks of the roles in the team.

Case 2 and case 4 are contradicting on every point except the point of using the IPM model without adjustments (Table 15). Case 2 the whole organizations described in documentation with the responsibilities of the multiple groups. Roles are also mentioned and the tasks are clear. In case 4 the IPM model is used but no further documentation is present on the organization or the roles.

Management in practice

In this Section, the eight cases are compared on their management in practice (Table 16). In Chapter 4, every case is analyzed on six points. First, is there been a shift in responsibility between the groups of the organization. Second, is there been a shift in tasks between the roles. Third, are decisions made in different groups in the organization. Fourth, is day-to day decision-making divided over the organization. Fifth, is overall decision-making divided in the organization. Lastly, did complications occur during execution, because of the decision-making structure?

Table 16 The cross-case analysis of management in practice.

#	Question	Case							
		1	2	3	4	5	6	7	8
1	Shift in responsibility of groups?	no	no	yes	n.a.	n.a.	n.a.	n.a.	yes
2	Shift in task division?	yes/no	no	yes	yes	n.a.	n.a.	n.a.	yes
3	Decision-making divided over organization?	yes	yes	no	no	no	no	no	yes
4	Operational decision making centerd/divided?	dev.	cen.	?	cen.	cen.	cen.	cen.	dev.
5	Overall decision making centerd/divided?	dev.	cen.	cen.	cen.	cen.	cen.	cen.	cen.
6	Complications in execution?	yes	no	yes/no	yes/no	no	no	no	yes/no

Overall

Case 1, 2, 3, and 8 have different groups in the organization (Table 16). The responsibility between groups changed by case 3 and case 8. Case 3 included the whole team during meetings and the proposed division was not used. Case 8 is implementing a new responsibility division, where still changed are made. Case 1 and case 2 the responsibility of each group stayed the same.

As shown in Table 16 a shift in task division is present in case 1, 3, 4, and 8. For case 1 in the AK1 team tasks moved, but the tasks were not documented. Case 3 the roles and their tasks were clear, but in practice this changed to a practical division. In case 4 the IPL took over contract negotiation. Also, the TM, CM, and SM took on day-to day decision-making on site. Case 8 the division of tasks is ongoing. The goal is to move up the decision-making for every role from the sub teams to the IPM team. Execution of the decisions is done in the sub teams. Only case 2 all tasks are executed by the person that was agreed upon. For case 5,

6, and 7 the tasks are not documented, because there is a practical division. In these cases, tasks are divided by experience and availability.

Only case 1, 2, 3 and 8 have an organization structure where decisions are made by different groups (Table 16). When focus on day-to day operational decision-making, case 1 and case 8 divided it over the organization. In case 2 the day-to day decision-making happens in the IPM team. For case 3 to case 7 the decision-making takes place in the project team. For overall decision-making only case 1 has a division in the organization. For case 3 to 7 the overall decision-making with the client. Case 2 and case 8 have placed the client or clients in a steering committee. Here is the project manager of the cases also present to represent the project team.

Complications in execution are found in case 1, 3, 4, and 8 (Table 16). In case 1 decision-making is divided over the organization and communication between the groups lacks. For example, decision made between the Construction Coordinator and a contractor from a development company is not communicated to the AK1 team. The contractor intervenes with the planning and activities of the AK1 team creating complications on the building site. In case 3 a shift occurred between the two groups that are created at the start of the project. In the meetings, all team members were present and involved in decision-making, causing unnecessary discussions for a clearly formulated project. The size of the team at case 4 create confusion between the stakeholders and contractor for who as in charge of communication. The team made mutual agreements on further communication. Case 8 is still in an early but complications showed between the project leaders of the sub team and the IPM teams on decision-making.

Client

Between case 1 and case 2 differences are noticeable (Table 16). Case 1 the two types of decision-making is divided over the organizations, whereas case 2 is not. Case 2 has a clear distinction between operational decision-making in the IPM team and overall decision-making in the Steering committee. During execution complications arise for case 1 whereas case 2 was rewarded for their excellent project management.

Case 3 and case 4 both shifted in task division (Table 16). Where case 3 included the whole team in the decision-making, case 4 made the decision in a small group within the team. Operational decision-making happened in the team and overall decision-making was up to the client. Both case 3 and 4 had some issues concerning communication within the team. Where case 3 had elaborated discussions for a well formulated project, had case 4 problems in communication within and outside the team.

Comparing case 5 to 8 in Table 16 a clear difference between case 8 and the rest is noticeable (Table 16). Case 8 there is a shift in responsibility between groups and in tasks between roles. Whereas, case 5 to 7 do not have multiple groups or clear task description of roles in their project. The decision-making in case 5 to 7 is in one spot and is only operational. Whereas, case 8 has operational decision-making divided among different groups. Overall decision-making is for all the cases not divided. Case 5 to 7 overall decision making is up to the client. Case 8 the overall decision-making happens in the Steering Committee. At case 8 complications arise due to Unclear who makes decisions on the construction site.

Management structure

Case 1 compared with case 8, both cases complications arise due to unclear decision-making on operational level (Table 16). What the cases have in common is the operation decision-making is divided in the organization. Overall decision-making is structured for case 8 in a steering committee, whereas case

1 is divided over the organization. Shifts in responsibility and tasks is present in case 8. Case 1 had some shifts in in the AK1 team itself.

Comparing Case 2 and case 4 in Table 16. Case 2 has no shift in responsibility or tasks. Decision-making is divided over the organization and is defined between operational and overall. Case 4 has no groups in the organization but had a practical shift in tasks. Decision-making was only done on operational level in the team. Overall decision-making was up to the client. Case 4 has some complications due to the size of the team and communication to external parties, as contractor and stakeholders. Case 2 did not have complications.

Opinion about the IPM model

In this Section, the view of every interviewee from the case analysis in Chapter 4 is compared. In Table 17 the following points are discussed. First, is the person experienced project manager. Second, during the project was the interviewee involved in other projects. Third, does the person have experience with using the IPM model. Fourth, is the IPM model used in the project. Fifth, is the IPM model useful for the project. Lastly, how should the IPM model be used by the IB on projects.

Table 17 The cross-case analysis of the opinions on the IPM model.

#	Question	Case							
		1	2	3	4	5	6	7	8
1	Experience as project manager?	no	yes	yes	no	yes	yes	yes	yes
2	Multiple projects at the same time?	yes	yes	yes	yes	no	yes	yes	no
3	Experience with IPM model	no	yes	yes	yes	no	no	yes	yes
4	Is the IPM model used in the project?	yes/no	yes	yes	yes	no	no	no	yes
5	Would the IPM model be useful?	no	yes	yes	adjusted	yes/no	no	no	yes
6	How to use the IPM model on projects?	Free	Free	Free	all, but adjusted	Free	Free	Free	all, but adjusted

The interviewees of case 1 and 4 do not have experience as project manager. Case 1 the Project Leader just started and for case 4 a Stakeholder Manager was interviewed. Most people are involved in other projects, except case 5 and case 8. The Project Leader of case 5 is only working on the OMOP program. The IPM of case 8 has also the task to help the IPM model get further in the organization. Most people who have experience with the IPM model used it in their project expect the Project Leader of case 7. He is involved in different projects as Stakeholder Manager, but chose not to use in because it makes the organization too complicated for the project (Appendix D: Case 7: Jan Luijkenstraat). Case 1 the model is used in the top of the organization, but not in the sub project team. The Project Leader of AK1 would not use the IPM model in her team, because it is meant to be for project with more uncertainty (Appendix D: Case 1: Amstelkwartier 1e Fase). Case 4 would adjust the model to make the team smaller (Appendix D: Case 4: President Allendelaan). Case 5 never used the model before but would consider the advantages of dividing the tasks (Appendix D: Case 5: OMOP Zuid). She is doubtful if the relieve is tasks weigh up to the amount of communication needed to manage the project. Project managers should choose themselves if the IPM model is needed or decided it within a discussion with the client. Only the interviewees of case 4 and case 8 think the IPM model can be used by every project, but in adjusted way where roles are combined.