When Effective Stakeholder Alignment Actions Are Carried Out, Within Infrastructure Projects

A single case study at Schiphol Landside Infrastructure

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When Effective Stakeholder Alignment Actions Are Carried Out, Within Infrastructure Projects

A single case study at Schiphol Landside Infrastructure

By

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Preface

This report is the result of the research performed as the final part of the master degree Construction Management and Engineering from the Delft University of Technology. I can proudly announce that I am very happy with the end result and think that the outcomes can be of use in practice.

I went through a long journey to arrive at this result. It started summer last year when I visited Marcel Hartog's office to pitch my idea. Luckily he was enthusiastic too! I wanted to look into the topic of stakeholder behaviour since people and their actions has always caught my interest. It is such a powerful mechanism. What do you have to do to get the support you need in infrastructure projects? This is a question that interested me.

I have learned that people's support or lack of support towards you is so important, and it is definitely something that I experienced during my thesis journey. For the support and opportunities that are given to me, I would first of all like to thank my whole committee, starting with Marcel Hertogh for coming up with the idea of doing qualitative research at the Ringweg-Zuid in Groningen. After looking into the Groningen option, that idea turned out to be unfeasible. However, the qualitative aspect remained, just as the city Groningen, although in a different way. It remains relevant in this research since my graduation falls on the same day as the siege of Groningen 348 years ago. It seems meant to be.
After having defined the research idea, I needed more committee members. I shortly discussed this with Marcel and we both thought Paul Chan would be a good candidate, especially because of his expertise in the qualitative research strategy I was planning to use. Paul, I also would like to thank you for your involvement and guidance. Telling me the stories about your research experiences and how and why you did things the way you had done them certainly made me think about how to approach my own research. Even though not every meeting fully reassured me about the work I completed, they were useful in pushing me further than I would have gone otherwise.
Also, I want to thank Erik-Jan Houwing for the catch-up talks. In the beginning of the research process they were mostly in front of our offices, with cups of coffee in our hands. Later on, we managed to shift those meetings online. Beside the talks, the detailed feedback you provided on my writing every time was very helpful to help me structure the report. As you said, '*you do have the content, now you should arrange it, just like a puzzle. Put the pieces in the right places'*. It sounds so easy, though the guidance you offered me there was very helpful.

Besides the supervisors from the university, I would also like to thank the committee members who joined from the company BAM Infraconsult. First, when the research was focused on another project, Clementine Roest helped me a lot with defining the problem and setting the scope. Although it seemed that the research plan was too ambitious for the available time, those talks we had in the beginning of the process helped me greatly with defining the scope and the focus. Also, later on, when I told you my findings during the research process, we could relate those to other projects you were involved in. This gave me the confidence that my results were not only applicable for the single case study I looked at. Thank you for staying connected during my whole journey.
After shifting to the Landside project, Hetty Messchaert became more and more involved. I also want to thank you for showing me your daily work on the days that I joined you on the project side itself. It gave me insight into the wide variety of daily activities. Alongside this look behind the scenes, you made it possible for me to conduct interviews with a broad variety of people, varying from directors till operators, who worked for different companies. I did not only get involved with the team from the case I studied for the research, but also within the company itself. Therefore, I would like to thank Susan van Hees. Thinking about other interesting projects for the research that were currently running and also providing my writings with detailed feedback even as the opportunity to present my progress for the stakeholder management and permits department gave me a positive stimulus to continue.
Seeing how interested and involved everyone was gave me a warm welcome from the beginning. Therefore, I would like to show my appreciation to all the people from BAM Infraconsult, and especially to the employees from the department of stakeholder management and permits.

Last but not least, my friends and family. Thank you all for the support and keeping my mind healthy by shifting my focus to other things in life and seeing things from other perspectives. And especially my boyfriend Alexander, for giving feedback on the language of my report and for offering a listening ear during all my ups and downs.

Nena Domino de Jong
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Contents

Summary 10

1. Introduction 13
1.1. Context 13
1.2. Identifying the Problem 13
1.3. Research Aim, Objective & Research Question 14
1.4. Scope 15
1.5. Commissioned Company 15
1.6. Report Structure 16

2. Literature study 17
2.1. Project success in relation to the position of stakeholders 17
2.2. Development of Stakeholder Management 19
2.3. We know a lot about what to do and how to do it 20
2.4. We don't know much about when to do it 23

3. Research design 25
3.1. Research approach; an empirical qualitative strategy 25
3.2. Single Case Study 25
3.3. Methods 27
3.3.1. Literature Study 28
3.3.2. Content Analysis 28
3.3.3. Semi-structured Interviews 28
3.3.4. Observing 28
3.4. Data Processing 28
3.5. Research Ethics 29

4. Analysis 30
4.1. Analysis Procedure 30
4.2. Graphical Summary Analysis Procedure 34

5. Results 35

6. Discussion & Recommendations 45
6.1. Validation 45
6.1.1 Validation method 45
6.1.2 Validation result 45
6.2. Discussion of the Findings 45
6.3. Limitations of the Research 47

6.4. Recommendations 47
6.4.1 For Future Alignment of Stakeholders in Infrastructure Projects 47
6.4.2 For Future Research 48
7. Conclusion 49
Bibliography 51
Appendix A 55

List of Figures

Figure 1: Main Stakeholder Alignment Components, based on PMI (Project Management Institute, 2013). 14
Figure 2: Organisation Structure (BAM, n.d.). 16
Figure 3: Key factors from Pinto & Slevin (1988). 18
Figure 4: Main Stakeholder Alignment Components, based on PMI (Project Management Institute, 2013). 20
Figure 5: Salience model for classification of stakeholders according to Mitchell (Mitchell et al., 1997). 21
Figure 6: Typology of Influence from stakeholders by Frooman (Frooman, 1999). 21
Figure 7: Power interest grid (Newcombe, 2003). 21
Figure 8: Critical success factors according to Nguyen et al. (2004). 22
Figure 9: Framework for successful stakeholder management in construction projects according to Yang et al. (2009). 22
Figure 10: Model of how to use the success factors (Oppong et al., 2017). 23
Figure 11: Lifecycle scheme with its characteristics (own figure), based on Aaltonen & Kujala (2010) 24
Figure 12: Stakeholder overview LIS (Messchaert & Reumer, 2019). 26
Figure 13: Stakeholder Satisfaction LIS measured every 4 months (BAM & Stakeholder Journey, 2020). 27
Figure 14: Multiple codes for the same text fragment. 30
Figure 15: Family code, sorted on groundedness. 31
Figure 16: Redundant codings. 31
Figure 17: Graphical summary overview from analysis process (own illustration). 34
Figure 18: Analysis from raw data to aggregate code Timing part 1 (own illustration). 35
Figure 19: Pre-activity document guideline (own illustration). 37
Figure 20: Analysis from raw data to aggregate code Timing part 2 (own illustration). 38
Figure 21: Analysis from raw data to aggregate code Timeliness (own illustration). 40
Figure 22: Interpretations of requirements (own illustration). 41
Figure 23: Analysis from raw data to aggregate code Time (own illustration). 42
Figure 24: Visualisation of data processing (own illustration). 44
Figure 25: V-model (Wilschut, 2018). 46

Summary

Introduction

Executing infrastructure development and maintenance work is a vital activity for keeping our economy running. This activity involves many different aspects that influence a project's success or failure. One of the success factors for an infrastructure project is the effective alignment of stakeholders. For infrastructure projects, this is not always done correctly as different examples show, such as the A4 motorway between Delft and Schiedam and the Oosterweel project in Antwerp. Given the relevance of keeping the infrastructure network in a good condition, an understanding is needed about the process of stakeholder alignment over time.

The objective of this research is to investigate a pattern in actions regarding how to align stakeholders effectively, by analysing an almost completed infrastructure project with a high stakeholder satisfaction level. To deliver the objective, the main research question is answered. The research question is formulated as follow:

What are we ***doing***, at which ***moment*** while ***aligning stakeholders*** effectively in infrastructure construction projects in a densely populated area?

Research Approach

To find an answer to the research question, it was chosen to perform a qualitative research. This is conducted in an empirical way, following the grounded theory approach in analysing the data. A single case is adopted for this study, because this offers an in-depth view. The criteria for the selected case were:

- ✓ The case for this research had to be a construction project which was almost finished.
- ✓ The project needed to be in The Netherlands.
- ✓ The project needed to be in a densely populated area.
- ✓ The project needed to have a high stakeholder satisfaction level.

This resulted in the selection of the Landside Infrastructure project of Schiphol, a sub-project of the works related to the capacity development of Schiphol airport.

Within the study, multiple methods were applied. First a literature study was carried out to identify the current knowledge about the subject, to see where the research gap was and to orient the focus. Then a content analysis was carried out, resulting in understanding how the project is organised and how it is situated in the environment in which it operates. This information was used to prepare the semi-structured interviews. Also, observations were made during the whole study.
To analyse the data, the program Atlas.ti was used, to code and interpret the data. The results of the study are compared to the earlier studied literature, documents and fieldnotes.

Results & Conclusion

The results can be categorised in actions related to time, timing and timeliness.

Timing refers to the moment in time when something happens. The first action related to timing is grabbing the opportunity, which can be further split up into *to signal* and *to document.*
Picking up signals from stakeholders makes it possible to make changes in the design, before the specific design is executed. When neglecting those signals, it often occurs that a change still has to be made later on, which is more difficult. *Post-activity documenting* makes it possible to prevent redundant discussions by pointing back to earlier made agreements and action points. Besides that, it can help inform those who are not involved in the project from the beginning. Besides the post-activity documentation, if and how the processes and the area itself are *documented in the beginning* are also of relevance. Having this documented is important, since it provides guidance during the process itself. The project management plan written upfront should also include a section about how stakeholders will be aligned. This plan is defined on three levels, each addressing a different question, namely the questions of why, what and how related to stakeholder alignment.
The other action related to **timing** is providing information, which can be further split up into *having a meeting* and *sending information*.
The correct timing of *having meetings* contributes to a clear information flow between the parties. There are several types of meetings during the project lifecycle. The type of meeting that the stakeholder is invited to depends on the

power and interest of the stakeholder. The stakeholders with a lot of power and a lot of interest, the so-called key stakeholders, should be invited to *frequently planned meetings*. This frequency is decided on together. If an action affects a stakeholder separately, so if there is an interface*, a separate meeting* is set up with them before the work starts to inform the stakeholder about the activity. This applies to all stakeholders.

Timeliness refers to the punctuality of actions, and if activities are carried out or completed on their planned moments. Therefore, the information flow plays an important role. Having the right information on the wrong moment or the other way around is not useful. This term information flow can be divided into the actions of *building a relation* and therewith *trust,* and *performing checks*, the so-called *validation and verification*.
To get the right information flow started, people need to *trust* each other. Building up the relation takes time, whereby keeping your promises or informing others when that is not feasible is important. This does not only apply to the relation with external stakeholders, but also to the internal project relation and even the team dynamics.
The other action that makes a proper information flow possible is *performing checks* with the information, the so called *verification and validation*. There are some critical points on the time path of the project which relate to how the stakeholder requirements are dealt with. Performing checks prevents the loss of information on the way and staying in the right direction.

Time is related to the duration of activities. This event can also be referred to as the **process** and can be divided into the approach of the *informal* and *formal* process. Both have a relation with time since they both define how long the process takes and how it proceeds.
The *formal process*: The relation and the level of trust between client and contractor defines the ease and therewith time of solving issues that suddenly pop up. This relation and trust are influenced by the type of contract and how both parties interpret the contract. Another issue with the formal process is that persons are placed on a role that does not suit them more frequently than one might expect. This leads to frustrations and works against the process, which makes moving to the *informal network* more attractive, since that process takes less time. Another factor that contributes to falling back to the informal network is the lack of documentation of procedures at the location of execution. Also, having employees who have continuously worked together at the company for a very long time contributes to being able to build up a strong informal network. The consequence is that people know what to expect from each other, something that makes moving to the informal network attractive too.

To conclude, to align stakeholders effectively it is important to have a clear idea of what the approach will be from the very start. Therefore, a project management plan is written, including a section about how stakeholders will be aligned. This plan is based on three levels with each their own questions and output.
Different strategies, related to the type of stakeholder can be defined. The key stakeholders should be kept in touch with on a regularly basis to build trust and a good relationship which contributes to a proper information flow. The frequency of those meetings is defined by all parties together. When the project is approaching its end, this frequency can be lowered. For stakeholders who do not fit in the category of key stakeholder, providing general information 2 months before a big event is recommended. Within those two months, specifying and sending the information frequently while reaching the date of the milestone is part of the plan. Also, when the construction works take place very close to the location of the stakeholder, a separate meeting is set up to inform this stakeholder about what will be happening there.
In all the cases mentioned above, documenting what is spoken about and which agreements are made is important.

Recommendations for stakeholder alignment

- Do not limit the scope to the visual end user. Most of the time there are more end users, such as the ones who have to carry out maintenance. Involving them in the process might result in other ideal solutions.
- Include the stakeholder manager in the core team of the project. This person should be up to date of what is happening in the team, because he or she has an essential role in passing on the correct information to the correct stakeholders.
- After getting the tender awarded, it is recommended to sit at the table with the client immediately to go through the requirements. This is so that in case of misinterpretation, it is clear in an early stage. It is also recommended to do this with the key stakeholders. It is better to know possible tensions between

stakeholders from the beginning, because then it can be anticipated, instead of it being a surprising factor during the execution of the work.

Recommendations for further research

- Since this study is a single case study, it would be of added value to do a comparative case study on another infrastructure project in a densely populated area and compare the outcome.
- This research was focused on a case with a high satisfaction level of the stakeholders. For future research it would be interesting to select a case with a low satisfaction level of the stakeholders. By comparing the outcomes of both studies, the influence of the different possible approaches can be identified.
- This research was mainly focused on the contractor and the execution phase. Since it seems that the alignment of stakeholders in the phases before the execution are of influence on the situation in the execution phase, it would be interesting to research the effect of different alignment strategies in the preparation phase.
- In the coming years, more data will be gathered about stakeholder satisfaction via the Stakeholder Journey or comparable stakeholder satisfaction measuring techniques. At that time, it would be of added value to conduct a **quantitative research** regarding the patterns of satisfaction and the characteristics of the projects.
- The discussion also addresses that people tend to prefer using the internal network besides the formal process. Why this happens and what people think the benefit of this move is regarding their alignment should be investigated further.

1. Introduction

This study is about stakeholder alignment within infrastructure construction projects and its relation to the project lifecycle. This chapter begins by first introducing the context behind the need for expanding infrastructure, followed by the problem definition. Then, boundaries are defined by giving the research objective and research question, and describing the scope of the research. Afterwards, the commissioned company is briefly introduced. Finally, the structure of the whole report is outlined.

1.1. Context

The Netherlands is driven by economic activity and is an important transit country for the transport of goods to the hinterland. A well-functioning infrastructure is necessary to keep fulfilling this task up to a satisfactory level, while also being important for social development (Beckers et al., 2013). Therefore, The Netherlands has one of the best developed and densest transport networks in Europe and the world (Ossokina & Brouwers, 2016).
The number of cars has continuously increased over the past, and this trend is expected to continue over the coming years. Similarly, the number of kilometres of road length has grown from 130,446 km in 2001 to 139,691 km in 2018, representing a growth of 7% (DVS/CBS, 2018). Similarly, railway tracks have grown almost 15% in the past 13 years (Dienst Verkeer en Scheepvaart & Statistiek, 2019), and are expected to keep increasing too. Also, airports and harbours feel the urge to continue developing and growing to meet the increasing demand from travellers and economic activity (Vella, 2019).
Besides new infrastructure, the current infrastructure needs maintenance. According to Koenen (2019) and Groot, Saitua and Visser (2016), this will become large scale in the near future, since there is currently major overdue maintenance which could lead to traffic jams and considerable economic damage. Constructing and maintaining infrastructure can be seen as an activity that will be necessary now and in the future.

1.2. Identifying the Problem

Executing infrastructure development and maintenance work involves many different aspects that influence a project's success or failure. One of the success factors for an infrastructure project is the effective alignment of stakeholders. For infrastructure projects, this is not always done correctly. One example that illustrates this is the construction of the approximately 7km long A4 motorway between Delft and Schiedam. The misalignment of the stakeholders gave rise to, amongst other issues, protest groups. The initial plan was made in 1952, but was delayed by these issues that resulted in a project duration that lasted 63 years. It is known that the construction of infrastructure projects can take multiple years to be realised. The total time from the beginning of the project idea till the realization of the idea is even much longer. Those infrastructure projects are becoming increasingly larger and more complex, and besides this, their impact on stakeholders is expanding even more. (Hup, 2015; Mabelo, 2020; Rozema & Bond, 2015). However, the example of the 63 years of the A4 motorway project is an exception in duration.
Another example is the Oosterweel project in Antwerp that consisted of the completion of the Antwerp ring road, including a river Scheldt crossing. During the planning, they omitted interaction with stakeholders, which resulted in significant resistance to the project from the local population. (Lauwers, 2012; van Brussel, 2018; Vlaamse overheid, stad Antwerpen, & burgerbewegingen stRatengeneraal, 2017).
These two project examples highlight the importance of aligning stakeholders, and that is where this research comes into view.

A recent trend which is seen of stakeholders is that they are getting increasingly involved and assertive about the area that they live or work in. One explanation is that open information shared on the internet and social media exposes them to stories about the positive and negative consequences of the actions carried out in infrastructure projects in different areas, making it easier to become more aware about their own situation. This does not have to be negative, as long as people who have a stake in the changing environment, the stakeholders of the project, are aligned with the project plan (Hertogh, 1997). However, this is often not the case. (Jurgens, Berthon, Edelman, & Pitt, 2016).

To smoothen the process, every potential interruption should be accounted for and avoided beforehand. Besides the process, it is also important to give the stakeholders a voice. It is necessary to have the stakeholders aligned, so that the project can be fulfilled successfully according to the chosen criteria. (Bourne, 2007; Rozema & Bond, 2015).

The main components to reach stakeholder alignment were addressed and included by the Project Management Institute in 2013. Those are simplified and shown in Figure 1.

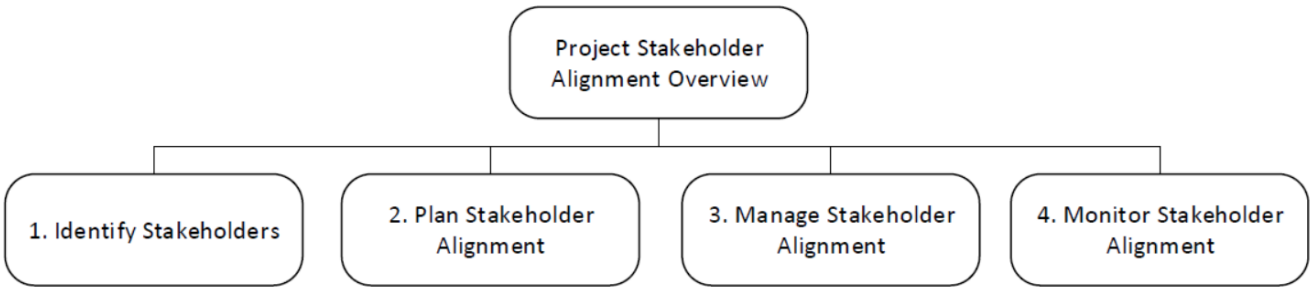

Figure 1: Main Stakeholder Alignment Components, based on PMI (Project Management Institure, 2013).

A lot of stakeholder theories are written, with the overall conclusion that one should identify the stakeholders, make a plan to inform and involve them early on and keep them satisfied. Well known theories that formed models are the salience model from Mitchell (Mitchell, Agle, & Wood, 1997), the stakeholder matrix from Frooman (Frooman, 1999) and the different stakeholder grids developed by Newcombe (Newcombe, 2003). These are explained in more detail in section 2.3.

1.3. Research Aim, Objective & Research Question

This section explains the research objective, research question and the sub-questions which extend from the research question.

Research Aim & Objective

At the start of the research, it is important that the subject of the research is carefully defined and embedded in the wider context of the project. Therefore, the **aim** is formulated, which describes the overall intention of the research. It answers the question of *what* the researcher wants to contribute to the current body of scientific knowledge. The alignment of stakeholders is a factor that can contribute to keeping the process of an infrastructure construction project running smoothly and add value to the project. Current theories and methods do give an answer to the question what you should do with the stakeholders of a project. However, the answer to 'when' to do those prescribed 'whats' is still not well known. Therefore, the aim of this study is to uncover the process of stakeholder alignment during the execution of the project.
In order to achieve this aim, the **objective** is formulated. The objective focusses on answering the question of *how* the researcher is planning on achieving the aim. The objective of this research is to investigate a pattern in actions regarding how to align stakeholders effectively, by analysing an almost completed infrastructure project with a high stakeholder satisfaction level.

Research Question

From the research objective, the research question can be derived which narrows down the objective and defines the direction of the investigation. As stated in the research objective, the goal is to contribute to the body of knowledge about stakeholder alignment in infrastructure construction projects, with the focus on when things happen to come to an effective result. To do this, a case is selected to find a pattern in what is done when to come to a good end result. Taking the aforementioned aspects into account, the research question is as follows:

What are we ***doing***, at which ***moment*** while ***aligning stakeholders*** effectively in infrastructure construction projects in a densely populated area?

Sub-questions

To support the main research question, 2 sub-questions are formulated. Each sub-question is related to a part of the main research question. Upon answering the sub-questions, the research question can be answered.

1. *What are the main actions in order to align stakeholders?*

This sub-question is related to the first part of the main research question. The actions that are found from the analysis of the data are compared to the actions found in literature. The ones that stand out in the data are further explained in the results section.

2. *When do the main actions, related to stakeholder alignment, occur?*

This sub-question is related to the *when* part of the research question. The phases of the project are looked at and the results from the first sub-question will be connected to those. Also, the data is used to find a pattern related to time in the actions.

The majority of sources used to collect the data for analysis are individual people, accessed mostly by questioning. The questioning is done in the form of an individual face-to-face semi-structured interview. Additionally, notes made during field observations, including the attendance of several project meetings, are used. Furthermore, project documents were consulted to analyse how the collected data compares to the plans defined in the beginning of the project.

1.4. Scope

During construction of large infrastructure projects, there are many different actors involved, each with their own perspective (Project Management Institure, 2013). Executing the construction work itself is mostly done by the contractor. Therefore, the research is conducted from the point of view of the contractor. Although the contractor is not involved in the project before the tender starts, this earlier phase is not neglected in the research, because decisions made there could have been of influence to the project process later on.
Infrastructure projects are executed in areas varying from sparse to densely populated areas. To narrow down the scope, this research is focused on infrastructure projects in densely populated areas. The reason for this is that stakeholder alignment is harder when more stakeholders are involved, which is more likely in a densely populated area. Studying a project in a rural area is therefore seen as less effective.
In 1984, Freeman published his book 'Strategic Management: A Stakeholder Approach', which is recognised to be the start of stakeholder theory (Stieb, 2009). The dissertation of Geert Teisman (Teisman, 1992) is also seen as a milestone within the topic of stakeholder alignment. Although these sources are not very recent, it is still useful to understand the development of project management in general and how it established itself to what it is today. Therefore, literature from that period is included in the scope of this research.

1.5. Commissioned Company

This graduation research is conducted in cooperation with BAM Infraconsult. BAM Infraconsult is one of the four business units under BAM Infra Nederland, which is part of the Royal BAM Group as is shown in Figure 2 (BAM, n.d.). BAM Infraconsult, the internal consultancy division of BAM, focussed on infrastructure works. They offer innovative solutions which are safe and sustainable. The slogan 'building the present, creating the future' also fits this ideal and shows what they are striving for. (BAM infra, n.d.).
The division within BAM Infraconsult which this research is most related to, is the environmental management and permits division. Their daily business is concerned with making sure that all permits have been arranged and everything stakeholder related.

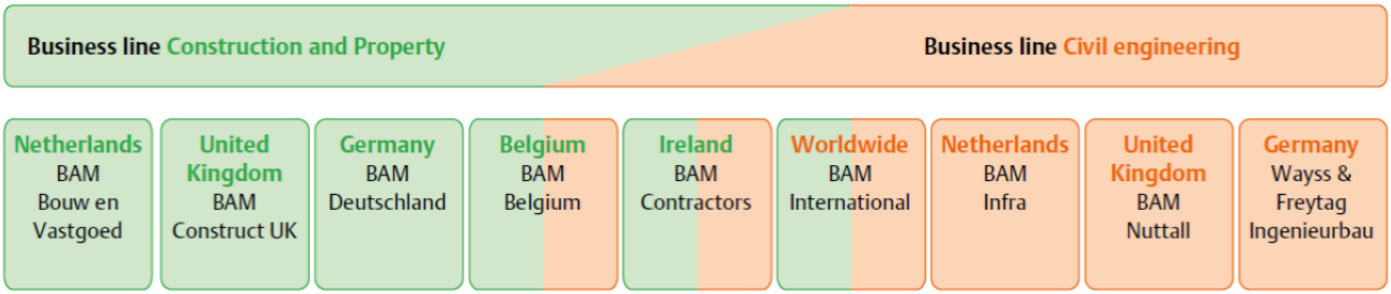

Figure 2: Organisation Structure (BAM, n.d.).

1.6. Report Structure

As a guideline for reading the thesis, the structure is as follows: Chapter 1 introduces the research area, followed by Chapter 2 with an overview of the literature review of the related topics. Chapter 3 explains how the research is designed to be able to answer the main research question. The exact steps of the analysis are described in Chapter 4. Next, in Chapter 5 the findings are presented after which they are discussed in Chapter 6, which also includes the limitations and recommendations of this research. Chapter 7 concludes the research by answering the research questions.

2. Literature study

This chapter provides an overview of the current body of knowledge. First, section 2.1 describes the position of stakeholders in defining project success. The next section, 2.2, explains how stakeholder management originated and how it integrated into the infrastructure construction sector. Also, the definition of the term 'stakeholder' and how it is used in this research is addressed. Thereafter, in section 2.3, theory about stakeholder alignment is expanded on and focuses on the specific aspects that are already known about stakeholder alignment and the different variants thereof. This is concluded in section 2.4 and leads to the underexposed 'when question', regarding stakeholder alignment in the infrastructure construction sector.

2.1. Project success in relation to the position of stakeholders

To say if a project is a success or not, it first has to be clear how project success is defined. It can be compared with daily life; not everyone uses the same criteria to determine if the day was a good day. This is the same when deciding if a project can be called successful. It actually depends on the set of principles or standards by which favourable outcomes can be completed within a set specifications. (Chan & Chan, 2004; Koops, 2017). Some of the frequently used methods to define the success of a project are the iron triangle and certain success criteria and factors. Those methods and the influence of stakeholders are further discussed in this section.

The iron triangle

A lot of research about project success has been carried out over the last decades, and most definitions of project success in literature are based on or can be led back to the iron triangle. This method functions on the rule that the project has to be finished within the traditional criteria: time, costs and quality. (Bourne, 2007; Turner & Zolin, 2012). If the different criteria of the iron triangle are focused on separately, a lot of research has been carried out there over the past years in relation to stakeholders. Those relations are discussed further below.

Time

For the **time** aspect it appears that construction delays (time) play a key role in the failure of a project (Durdyev & Hosseini, 2019; Wang & Yuan, 2017; Zidane & Andersen, 2018). It seems that delays of construction projects are a universal problem. Some famous examples are the construction of Kuala Lumpur's new airport terminal, the Eurotunnel and the Betuwe Line (Beckers et al., 2013). A couple of the overall delay factors derived from those studies can be traced back to stakeholder alignment, such as poor communication and coordination between parties, conflicts among stakeholders, improper design, user issues and external stakeholders. Also, it is not a very new phenomenon, since research on this topic started already in 1985 with the study of Arditi (Arditi, Akan, & Gurdamar, 1985) about construction delays in Turkey (Durdyev & Hosseini, 2019; Wang & Yuan, 2017; Zidane & Andersen, 2018).

Costs

The before mentioned time delays are often related to **costs.** The longer the project duration, the more it will cost. The construction of Kuala Lumpur's new airport terminal, the Eurotunnel and the Betuwe Line, which all dealt with time delays, also had to deal with huge cost overruns. (Beckers et al., 2013). The costs aspect is one of the other criteria of the iron triangle, where thorough research has also been done in relation to stakeholder influence. Within the construction sector the perception towards stakeholder engagement was that one must avoid spending too much time on it, because time is money. The more attention is given to the stakeholders, the more man-hours must be dedicated to collaborating with them. Additionally, giving them a voice results in a higher chance that changes have to be made in the design and planning, further raising the costs. However, several studies show that the alignment of the project with stakeholders' needs and objectives is critical to the successful management of stakeholders as described earlier in this chapter. (Safapour, Kermanshachi, Shane, & Anderson, 2017).

Quality

The last criteria of the triangle, the **quality**, usually experiences problems when costs and time are at stake (Davis, 2017). Quality is then sacrificed, and not many other options are looked at because it takes time again which means further delay. By paying attention to managing a specific groups of stakeholders, this will have a powerful effect on achieving strategic goals and long-term viability, thus the quality. (Baskerville, 1999).

The explanation of the stakeholders' influence on the criteria of the iron triangle shows that their influence is not limited to one side only. This implies that whichever part of the success / failure aspect requires improvement, stakeholders play a role in all of them.
Later research showed that among the mentioned iron triangle criteria, understanding and managing stakeholders' perceptions of the project objective is also something that determines if a project will be referred to as a success or failure. (Davis, 2017; Durdyev & Hosseini, 2019; Koops, 2017; T. S. Nguyen & Mohamed, 2018). Davies looked more into those perceptions specified to different stakeholder groups and shows us that **time** is the most recognized theme within all groups. His study indicated that each stakeholder group gave priority to different project performance attributes, but that the ones from the iron triangle were brought up by everyone.

Success factors

Besides the iron triangle, the concept of success factors is often used to define what to do to reach a success. The critical success factor approach was first used by Rockart in 1979 and contained factors that can be seen as areas that ensure successful competitive performance for the organisation if the results are satisfactory. It is a commonly used method to improve the management process. (Yang, Shen, Drew, & Ho, 2010). In the field of stakeholder management, most research about this topic can be traced back to the instrument made by Pinto and Slevin in 1987 (Davis, 2017; Pinto & Slevin, 1988). The key factors are visualised in Figure 3. As the figure shows, communication is the important action, split into different topics. This also shows the importance of stakeholder alignment. Monitoring and feedback is seen as an important action to keep track of the existence of the alignment. In the timeframe that this model was set up, mostly primary stakeholders were addressed, such as the client. This is a point of difference with projects executed nowadays. The importance of the secondary stakeholders should not be underestimated due to new technological developments and the way that people can be provided with (unwanted) information. (Jurgens et al., 2016).

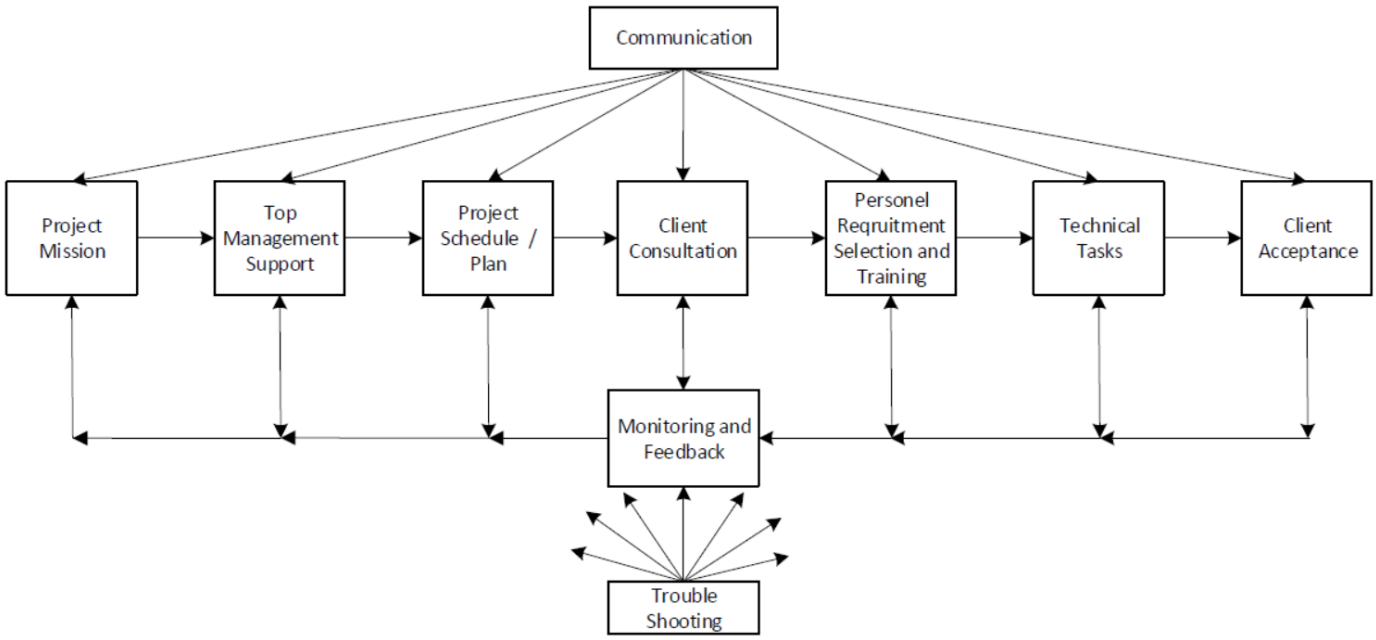

Figure 3: Key factors from Pinto & Slevin (1988).

In 2003, Westerveld looked at the definition of project success in a broader way, where he linked success criteria and success factors for his definition of project success (Westerveld, 2003). The difference between a success criterion and a success factor is that the criteria are the things identified by the stakeholders that should be achieved in order to make the project a success. Success factors on the other hand are factors that, when present in the environment of the project, can contribute to the achievement of a successful project. The study of Koops (2017) also had a wider vision and looked more at the contextual elements and came to three contextual criteria to define project success. The first one is described by the fit for purpose, the second by political and social objectives and the last element is related to meeting the needs of stakeholders and meeting the needs of shareholders as the main criteria for assessing the success of an infrastructure project.

All the theories and research findings mentioned in this section indicate that the influence of stakeholder alignment on the end result of a project should not be underestimated.

2.2. Development of Stakeholder Management

This paragraph will go deeper into the development of stakeholder management and gives a short overview of the history of this topic. Although stakeholder alignment is a more suitable term to use, since that is what one finally wants to achieve by managing them, literature mostly uses the term manage or engage.

The history of stakeholder management goes far back in time. It was first brought up in 1963 by the Stanford Research Institute (Mok, Shen, & Yang, 2015). Later on, in 1984, Freeman opened the subject with the publication of his book 'Strategic Management: A Stakeholder Approach'. From then on, the research on stakeholder management increased. The attention on stakeholder management for infrastructure started in the early nineties, with a rapid rise later on in 2006 (Mok et al., 2015; Yang et al., 2010). An advisory report requested by the Dutch government in 1991 about the quality of decision-making on large infrastructure project even concluded that in order to protect external interests, the decision-making process should be restructured. It must be aimed at ensuring that an entire weighing of interests take place when a large project is established. (WRR, 1994). The dissertation of Teisman (Teisman, 1992) is also seen as a milestone within the stakeholder alignment topic, just as the book about process management written by De Bruijn, Ten Heuvelhof & In 't Veld published in 2010 .

The definition of a stakeholder

At the start of the research period about stakeholder management, the definition of a stakeholder corresponded more with shareholders. Internal stakeholders, primary stakeholders or business actors are all used to define the same: stakeholders who had a financial interest in any case. They were included, but as soon as there was little or no leverage, this group became less relevant within the stakeholder project management approach. (Aaltonen & Kujala, 2010; Wiley, 2009). This caused the start of stakeholder management research to mostly focus on the internal stakeholders group. Aaltonen (2010) noticed this and revealed a paradox with regard to the optimal timing for including secondary stakeholders in the project's decision making processes. He concluded that the mismatch of timing in the possibility to influence and the capability to influence may result in conflict escalation during the project execution phase. Also Jurgens et al. (2016) mentions the growing importance of the secondary stakeholder group. With the coming of the internet and social media, the asymmetry of influence has changed, resulting in that secondary stakeholders should be seen as having more influence than before.

Over time, the definition and what exactly is meant with the term stakeholders has changed. Some writers took a wider definition, such as Freeman, who in his publication in 1984 defined a stakeholder as one "*who can affect or is affected by the achievement of the firm's objectives*" (Freeman, 1984; Freeman, Harrison, Wicks, Parmar, & de Colle, 2010; Mok et al., 2015). Another example is from the Stanford Research Institute who described stakeholders as "*groups without whose support the organization would cease to exist"*. This definition is more focused on the internal stakeholders. Others went for a narrower definition, such as Olander (Olander, 2007): '*a project stakeholder can be defined as a person or group of people who has a vested interest in the success of a project and the environment within which the project operates'.* The author means that with a vested interest, the stakeholder has one or more of the stakeholder's attributes of power, legitimacy or urgency.

The pitfall of a too broad or too narrow definition is the inclusion of too many stakeholders who are not important to the project, or the opposite, namely leaving out some important stakeholders. For this research the definition of Molwus (Molwus, 2014) is used, because that research also highlighted the effect of too broad or too narrow definitions and defined the stakeholder definition specifically for the construction sector instead of general project management. The definition used in this research is as follows:

"Construction project stakeholders are individuals or groups / organizations who are affected by the works either during the project or due to the outcome of the project."

2.3. We know a lot about what to do and how to do it

The fact that stakeholder alignment is an essential part of the overall project integration management is apparent in the overview given by the Project Management Institute (2013). A part of developing the project management plan is committed to plan stakeholder management and control stakeholder engagement. This stakeholder management activity can be divided in four parts as formulated by the PMI. Figure 4 shows a simplified version. As can be seen, it is known what must be done, namely going through all four phases from the left side till the right side. It starts with identifying who must be dealt with, and progresses to keeping them satisfied with work being carried out. This section pays attention to explaining what literature says must be done to align stakeholders and how that needs to be carried out.

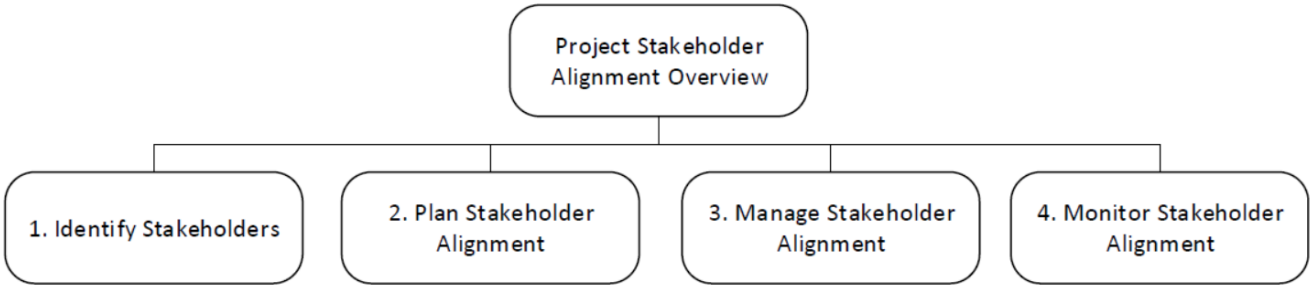

Figure 4: Main Stakeholder Alignment Components, based on PMI (Project Management Institute, 2013).

Classification

Before it is known what should be done to align the stakeholders with the project goal, it must first be known who those stakeholders are. The Netherlands Scientific Council for Governement Policy has also pointed out, in the case of the expansion of Schiphol, that a good selection of the relevant stakeholders is necessary to get social support. Selecting the right stakeholders can contribute to reaching a consensus. (Butter den & Burgers, 2003).

It seems that choosing only one general stakeholder approach does not fit every stakeholder that well. Therefore, a way to classify stakeholders is developed. Each group has its own needs regarding how to get them aligned. The salience model from Mitchell (Mitchell et al., 1997), as shown in Figure 5, and the stakeholder matrix based on dependencies from Frooman (Frooman, 1999) shown in Figure 6 are the basis of other nowadays frequently used methods to classify stakeholders. (Aaltonen & Kujala, 2010; T. S. Nguyen & Mohamed, 2018).

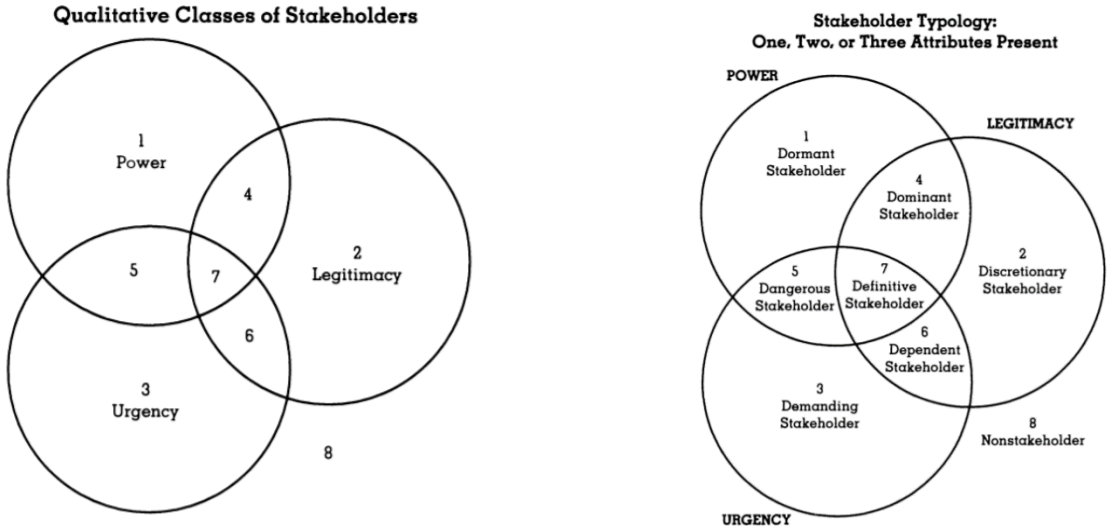

Figure 5: Salience model for classification of stakeholders according to Mitchell (Mitchell et al., 1997).

Typology of Influence Strategies

Is the firm dependent on the stakeholder?	Is the stakeholder dependent on the firm?	
	No	**Yes**
No	Indirect/withholding (low interdependence)	Indirect/usage (firm power)
Yes	Direct/withholding (stakeholder power)	Direct/usage (high interdependence)

Figure 6: Typology of Influence from stakeholders by Frooman (Frooman, 1999).

The power interest grid (Figure 7) thoroughly mentioned by Newcombe in 2003 (Newcombe, 2003) is a common method used nowadays to classify stakeholders in construction projects. Other common classification models are based on the power/influence grid, influence/impact grid and still the salience model which is based on the power and legitimacy of a stakeholder. To classify stakeholders, multiple grids can also be used. (Project Management Institure, 2013).

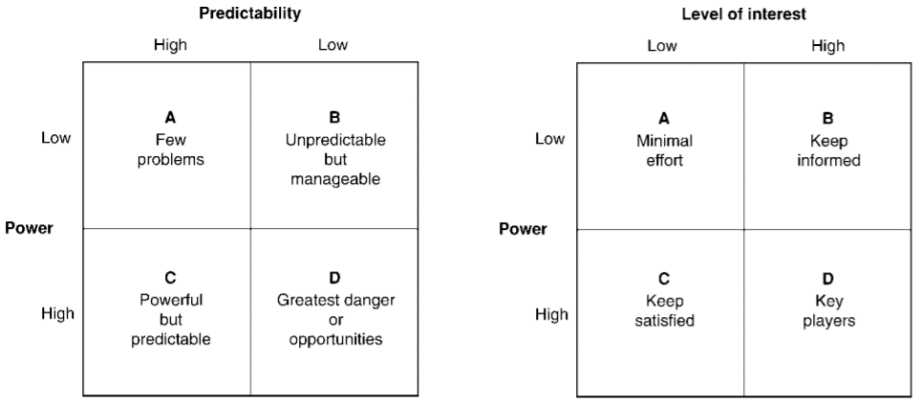

Figure 7: Power interest grid (Newcombe, 2003).

Success factors

Besides the classification of stakeholders, another researched subject which has been studied often are the success factors of stakeholder alignment.

Nguyen et al. (2004) carried out research by holding a survey questionnaire by practitioners. Factor analysis was then used to derive interrelationships and to categorize these success factors which resulted in four categories: comfort, competence, commitment and communication (Figure 8). This research was done in Vietnam, but it is mentioned in the paper that the results can be used as a guideline to successfully handle construction projects in Vietnam, as well as in other countries.

Influencing components	Principle components Component 1 First COM – comfort	Component 2 Second COM – competence	Component 3 Third COM – commitment	Component 4 Fourth COM – communication
1	Adequate funding throughout the project	Up to date technology utilization	Commitment to project	Community involvement
2	Comprehensive contract documentation	Proper emphasis on past experience	Clear objectives and scope	Clear information/communications channels
3	Availability of resources	Multidisciplinary/competent project team	Top management support	Frequent progress meeting
4	Continuing involvement of stakeholders	Awarding bids to the right designer/contractor		
5	Competent project managers			

Figure 8: Critical success factors according to Nguyen et al. (2004).

The research from Yang et al. (Yang, Shen, Ho, Drew, & Chan, 2009) also focusses on the exploration of critical success factors (CSF's) for stakeholder management in construction projects and is focused on Hong Kong. Their approach is to first identify 15 critical success factors through a literature review. Those were consolidated by interviews and pilot studies with professionals in construction industry and a questionnaire survey. A factor analysis on those 15 CSF's resulted in 5 groups; precondition factor, stakeholder estimation, information inputs, decision-making and sustainable support (Figure 9)(Yang et al., 2009). In the conclusion, the writers mention the fact that the interviews and questionnaire survey were conducted locally in Hong Kong, so that the findings may not be generalized to the other geographical locations.

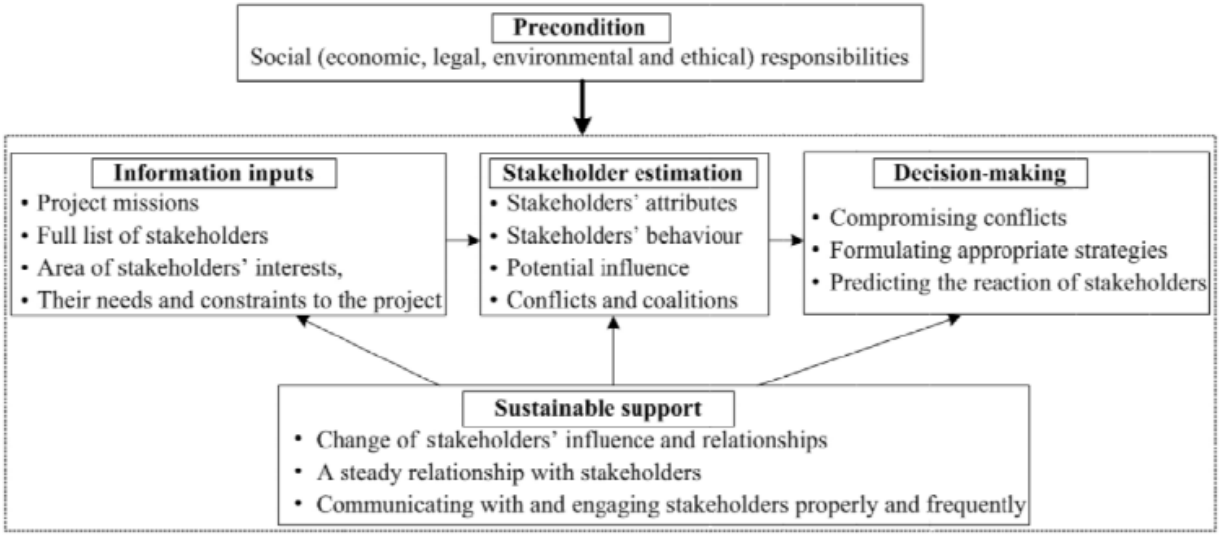

Figure 9: Framework for successful stakeholder management in construction projects according to Yang et al. (2009).

Another research by Yang et al (2010), is similarly focused on critical success factors for stakeholder management from the construction practitioners' perspective. The research approach was comparable to the research performed in 2009 and also focused on the situation in Hong Kong. It started with a questionnaire survey to collect the opinions of construction practitioners regarding the relative importance of CSF's for stakeholder management. The factor 'social responsibilities' is seen as the most important one.

An overview of the CSF's from the above-mentioned literature is summarized in Appendix A. It is clear that it is known very well *how* to classify the stakeholders from a project based on different factors. Also, which criteria should be addressed by defining *what* the strategy of keeping the stakeholders aligned is often studied.

Oppong et al. (Oppong, Chan, & Dansoh, 2017) went one step further with those factors. He used them to develop a model of how the success factors should be used. This model is shown in Figure 10. The key factor from the model of Pinto and Slevin, which was monitoring and feedback, is still a prominent action that should be undertaken as can be seen in Figure 10 below the dotted line.

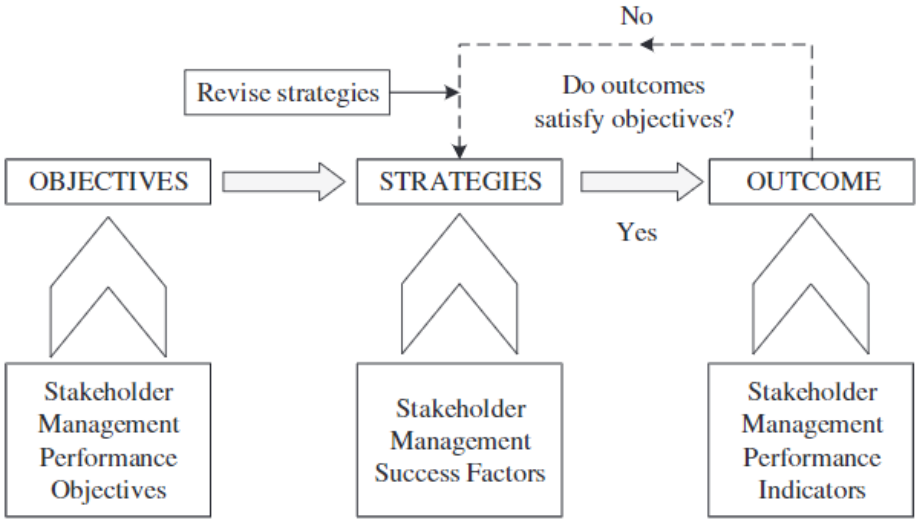

Figure 10: Model of how to use the success factors (Oppong et al., 2017).

2.4. We don't know much about when to do it

As shown in the previous sections, there is already a lot known about stakeholder alignment. However, several studies mention the occurrence of example cases with a failure in the process, which is something that is still reported by the newspapers too. The factor time is sometimes mentioned in different studies. Lifecycles and the involvement of different stakeholders during those stages is looked at by Aaltonen (Aaltonen & Kujala, 2010). What is seen is that opposing stakeholders are not provided with in-depth information about the project, nor actively engaged in the beginning in order to reach a project go-decision. The downside of this management strategy is that the effect of not engaging them will be visible later on in the execution phase when changing things agreed on in the feasibility phase is hardly achievable. This process is presented in the lifecycle scheme with its characteristics per phase in Figure 11. The project lifecycle is pretty clear and several researchers agree that the main phases can be denoted by the investment preparation phase, the project execution phase and the operations phase. It is also acknowledged that the characteristics from those phases are drastically different. (Aaltonen & Kujala, 2010).

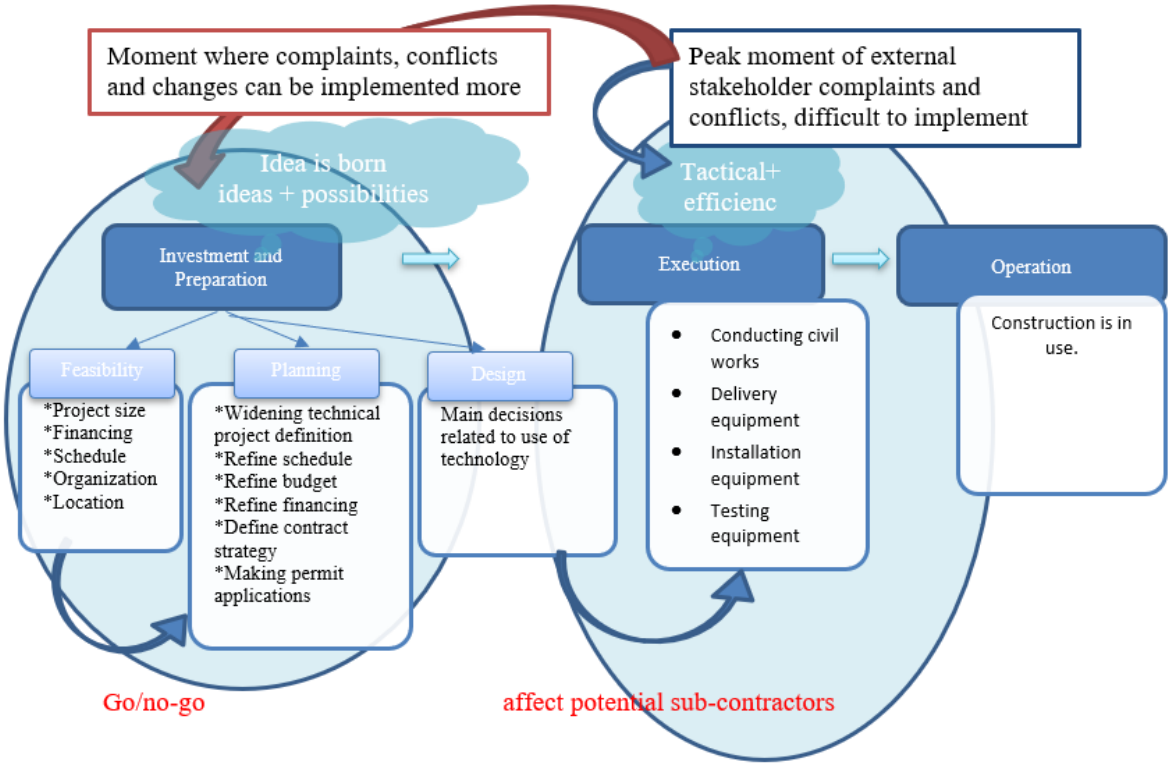

Figure 11: Lifecycle scheme with its characteristics (own figure), based on Aaltonen & Kujala (2010).

Besides the information provided to the stakeholders, the visibility of the project over time is also a factor that makes the stakeholders rise to action and speak out. This is especially noticeable during the execution phase. What is left out in most studies is how this can be anticipated in advance, to prevent problems later on. Therefore, the input of the studies which looked at the stakeholder behaviour is very useful to build on, such as the research of Rowely. (Rowley & Moldoveanu, 2003).

The general conclusion of all those studies is that it is known that the stakeholders must be involved during the project lifecycle and there are a lot of theories and practises about the ways to align them. However, the timing of those actions is related to the project lifecycle, so when those critical moments are, is not yet looked at.

The issue of stakeholder engagement over time is also pointed out by the research of Lehtinen et al (Lehtinen, Aaltonen, & Rajala, 2019). In their research background part, they mention that an in-depth overview of how external stakeholders are engaged and disengaged over time in practice, and how this interplay unfolds over time, is missing in prior literature. Their research looks at the disengagement part, so the question of the engagement over time still stays unanswered. Also, the timeline aspect they incorporated in their research was not connected to the different stages of a construction project lifecycle. This timeline was more used to illustrate the order of practice.
The change of perceptions over time is mentioned by Turner and Zolin (Turner & Zolin, 2012), and Aaltonen & Kujala (2016) mention that prior research on stakeholder management is mostly focussed on the interactions in the early lifecycle phases. Consequently, it is hard to say if and how the timeliness of the actions undertaken in those early lifecycles have their effects in later phases of the project. Those researches are timeline related, nevertheless, they are focused on one part of the moment. And that is where this study contributes, looking at the whole project time, with a focus on the engagement actions coming from the contractors' side.

It is concluded, after this literature review, that not much research has been done into the topic of when things related to stakeholder alignment are being done. Studies do mention that it is worth looking into, but it has not been done yet. Therefore, the aim of this thesis is to give a basis of a theory that explains the question of 'what we are doing when, according to stakeholder alignment in infrastructure construction projects in densely populated area's'.

3. Research design

This chapter will describe the qualitative research strategy, followed by the research methods used to collect and analyse the data.

3.1. Research approach; an empirical qualitative strategy

The selection of the research strategy determines a lot for the direction of a research. Verschuren (Verschuren & Doorewaard, 2010) uses 3 questions to decide on an approach. The first question asks if the researcher opts for an in-depth or for a broad view of the research. For this research, the focus lies on a smaller scale, so that means an in-depth view.
The next two questions are about a quantitative or qualitative approach and whether the researcher chooses for an empirical type of research. The qualitative approach fits this research because qualitative research is related to the exploration of specific thoughts or experiences through audio, visual or text documents to gain an understanding of what happens. This will be done in an empirical way.

The empirical research follows the grounded theory approach in analysing the data. Therefore, the research moves from observation to ideas and from specific to more general and thus is an inductive research (Patzelt, n.d.). This whole theory is based on an inductive analysis, so after processing a set of data, results will be looked for before going to the next part of data collection. Furthermore, when analysing the data, a lot of going back and forward occurs. New insights gained in later interviews can be of value in earlier conclusions.

3.2. Single Case Study

According to Verschuren (2010) a case study is a research strategy to gain an in depth and full insight into one or several objects or processes restricted in a certain time and space. What distinguishes a case study is that the case is studied in its natural context, so on site. Visiting the project, interviewing people on location and making observations are characteristic for a case study.

Case selection

For selection of a suitable case for this research, the idea of the research was shared with the commissioned company. After looking into the ongoing projects combined with other criteria for the case selection which were:

- ✓ The case for this research had to be a construction project which was almost finished.
- ✓ The project needed to be in The Netherlands.
- ✓ The project needed to be in a densely populated area.
- ✓ The project needed to have a high stakeholder satisfaction level.

An almost finished project was chosen so that the project's events were still fresh in people's memories. A densely populated area was required because of the dynamics with different stakeholders. To determine the stakeholder satisfaction, the score on the Stakeholder Journey is used as an indication. This Stakeholder Journey is sent repeatedly to the stakeholders to measure their satisfaction and to discover problems in an early stage. In collaboration with BAM, the Landside Infrastructure (LIS) project was chosen to be the case for this research project. This case is described more in detail in the next section.

Selected Case Description

For this research the case that is studied is the Landside Infrastructure project at Schiphol, based on the aforementioned criteria. This section gives an introduction to the case.

The ambition of Schiphol is to be Europe's preferred airport by 2025. With the expectation that passenger numbers will grow by 25% in the years ahead, they decided to build a new pier and terminal. (Capital Programme, 2016). The Landside Infrastructure project (LIS) is a sub-project of the works related to the capacity development of Schiphol airport. In detail, the tender document describes the content of the LIS project as follows: *'the project includes the construction of landside access roads for the new terminal, creating additional landside traffic capacity and installing and rerouting necessary underground utilities. Establishing the detailed design (based on a final design submitted by Schiphol Nederland BV (SNBV)) is part of the scope of work.'*(TenderNet, 2017).

The contract of the work is based on the FIDIC Conditions of Contract for Plant and Design-Build, also called Yellow Book (Project team Landside, 2017). FIDIC, the International Federation of Consulting Engineers, is known for its standard form contracts for the construction and engineering industry. Those contracts are used internationally. The motivation for this contract type for LIS was to have a balanced allocation of risks between client and contractor. It was also chosen because of the international character of the organisation. The Yellow Book is used for works primarily designed by the contractor, with the design and build contracts. However, in this case, the additional documents within the contract resulted in a construct and build type of contract. Thereby the initial design responsibility is shifted more towards the client.

Royal Schiphol Group consists of different sub-groups. Within the organisation, Capital Programme is the project group that is responsible for the projects related to the expansion of Schiphol. It is an internationally composed organisation. Building airports is not an activity that happens repeatedly in a country, so that is why people with this expertise travel to the locations where the airports have to be built. For this airport expansion project, some of those persons who have experience with developing airports were asked to be involved in this project too.

The LIS project is based in a densely populated area. An overview of the key stakeholders is shown in Figure 12. It points out that there are a lot of different companies and business divisions involved, but no residents. Most infrastructure projects do have residents as a stakeholder group, since the infrastructure passes the residential area or residents are one of the main users of the infrastructure. This is something to take into account, since the requirements of residents mostly differ from the requirements of companies.

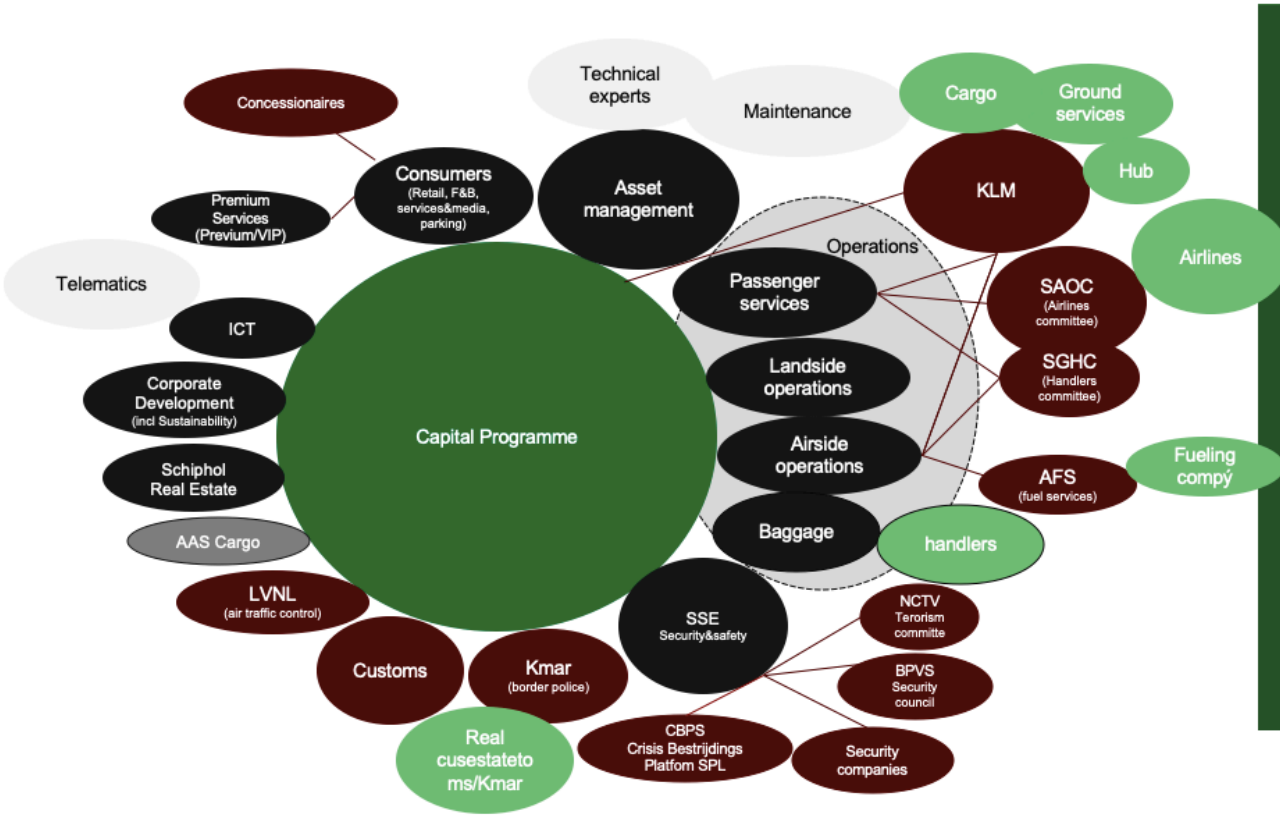

Figure 12: Stakeholder overview LIS (Messchaert & Reumer, 2019).

The objectives for the airlines, border police, retailers and employers can be summarised as minimal hindrance and disruption, and much happier travelers in the end. For the partners of Capital Programme (public transport companies, town and district planning, Infrastructure & Environment and the municipality), the objective is namely promoting understanding and tolerance of the inevitable disruptions, to minimize the dissatisfaction amongst travelers.

In the Project Management Plan, the contractor planned out how to align the stakeholders. This is done at three levels. Strategical, which is related to the question: why is stakeholder alignment is necessary? Tactical, which is related to the what question: what are we planning to do to align the stakeholders? And the operational level which is related to the how question: how are we planning to align the stakeholders? This ensures a good idea of the intended approach beforehand. Within this plan, the stakeholders are classified based on the power interest matrix.

Almost all criteria for the case selection are met. Schiphol is a densely populated area in The Netherlands. The project was planned to be finished in the beginning of 2020, however, during the project this end date was postponed till the end of October 2020.

The last criteria for a suitable case for this research was the high level of stakeholder satisfaction. To define the stakeholder satisfaction, the results of the measures of the Stakeholder Journey are used as an indication. As shown in Figure 13, the LIS project has a relatively high overall satisfaction level of the stakeholders.

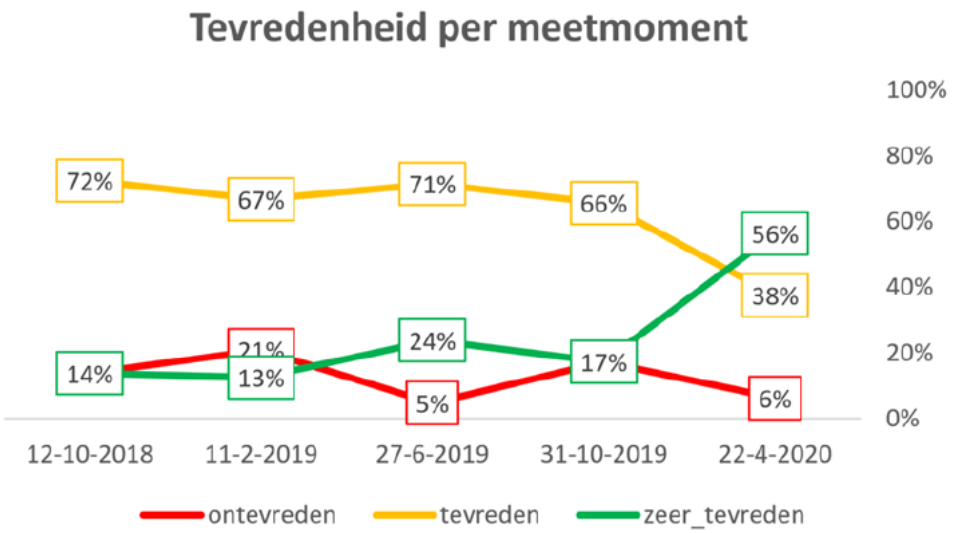

Figure 13: Stakeholder Satisfaction LIS measured every 4 months (BAM & Stakeholder Journey, 2020).

Case study design

After the selection of the case, documents of the LIS project were studied to get an overall understanding of how the project was put together and which stakeholders were involved. Also, the Stakeholder Journey results were looked at, to see which problems were addressed there. Combined with the conducted literature research this was implemented in semi-structured interviews. The interview set-up can be found in **Fout! Verwijzingsbron niet gevonden.**. Those interviews were held with people from the contractor's side and also the client to see how the stakeholder approach was done. Stakeholders of the project were also interviewed with the intention to see how the described stakeholder alignment approach was experienced.

By having different viewpoints, data about the whole project is gathered. The conclusions from processing the semi-structured interviews are compared with the observations made on site and the received documents about the project. The findings from the semi-structured interviews are send back to the interviewees to ask for their feedback.

3.3. Methods

To be able to collect data, a certain research method needs to be used. (Bryman, 2015) Qualitative research, as described in the research design part in section 2.1, is usually not restricted to only one method, but rather a combination of methods. This also applies to this research, which used the following methods: literature study, content analysis, semi-structured interviews, and observations at the location itself. This combination of methods is also known as the triangulation of sources and is characteristic for a single-case study. (Verschuren & Doorewaard, 2010). The motivation for using these methods in this research and what they include will be discussed in this chapter. Followed by a description of how the data is organised and analysed.

3.3.1. Literature Study

This research started with an explorative study into existing literature about stakeholder management and the success factors in that field. This literature study was needed to identify the current knowledge about the subject, to see where the research gap was and to orient the focus. It quickly became clear that stakeholder *alignment* was a better term to use in state of management, since that is what is actually strived for. When stakeholders are managed, it does not necessarily mean that they are also aligned with each other. After this explorative literature study, the main research question was formulated.
Subsequently, the literature study method was also used to see what earlier research has concluded about the research question and how they came to their conclusions. This is helpful to justify this research and situate it in the current body of knowledge.

3.3.2. Content Analysis

The empirical part of the research starts with the content analysis. To get a feeling for the case which the research is related to, a number of documents about the case have been consulted. This results in understanding of how the project is organised and how it is situated in the environment in which it operates. The content analysis includes a description of the project with a timeline and the characteristics of the project so that the content of the researched area is clear. The project content also helps to define the research objective. (Verschuren & Doorewaard, 2010).

3.3.3. Semi-structured Interviews

For this research, the semi-structured approach is chosen because of the more open-ended approach allowing the participants to have a discussion rather than a straightforward question and answer format. This, however, does not mean that the interviewer is not prepared at all. Topics which ought to be covered during the interview are defined upfront in preparation, however the order of the topics in the discussion do not necessarily have to match a predefined order. Another advantage of this interview approach is that it is also a good way to let new ideas be brought up, since the structure does allow one to divert. The open character gives a potential reason to ask questions which were not prepared. This makes it possible to get more in-depth information out of the interview which can also be reached with a discussion.
The interviews are held face to face and individually with people who are involved in the project studied for this research. Those persons are not all from the same company. This is done so that different viewpoints of stakeholder alignment are gathered, which is important to prevent a tunnel vision. The interviewees range from the project director to the team members, to gather information ranging from an overview of the entire project to close up insights on specific practices. The number of people for the interviews was not defined beforehand. Reaching saturation in information that came forward during the interviews was strived for. (Galvin, 2015). This saturation point was reached with 9 participants in total.

3.3.4. Observing

Although much information can be sourced from only the conducted interviews, observations of the project in person are just as important. Spoken words are not as reliable if they are not realised or at least recognised in practice. Attending meetings and working at the office location became a routine of the week. By attending multiple meetings, the differences between those meetings could be noticed and thereby the influence of different parties. A side-note has to be made about objectivity: while the primary goal of the researcher is to stay as objective as possible, the added attendance at the office resulted in more exposure to the contractor's work culture than the other cultures, and therefore may have influenced the objectivity of the total information gathered. On the other hand, the insight gained on how the teams work together is very helpful to understand the actual execution of the project plans.

3.4. Data Processing

Now the data is gathered the processing of all the information started. This was done by using a qualitative data processing program named Atlas.ti. With this program the data is coded which is prescribed by the use of the Grounded Theory Approach (GTA). Coding the data means choosing labels that act as keywords covering the contents of the data and assigning those labels to the relevant sections of the data.

Within the Grounded Theory there are three levels to analyse the obtained data. Those are from initial to advanced: open coding, axial coding and selective coding conferring to the evolved grounded theory. For this study, only the open coding phase has been carried out. This results in an overview of the most important themes.
The purpose of the open coding phase was to start the process of dissecting the data to compare incidents and to look for similarities and differences in emerging patterns in the data. Important words or groups of words were identified and labelled. Co-occurrences of codes were used to see relationships between those codes.

The interview transcripts are very rich in information. To prevent the researcher getting lost in all the data, an initial codebook is made. This table can be found in Appendix B. The codes are based on prior knowledge and literature which was read to come to this research. The research question is used to define the different glasses which with the researcher looked at the data. The research question is:

What are we ***doing***, at which ***moment*** while ***aligning stakeholders*** effectively in infrastructure construction projects in a densely populated area?

The bold and italic words were the keywords for this research. Those were used to define the most important information to look for in the data, to determine the pair of glasses the researcher put on while looking at the data. During the analysis, the code book will change. Codes obtained from the interviews will be added and codes which don't fit will be removed. The final codebook can be found in **Fout! Verwijzingsbron niet gevonden.**.

Validation

In the case of a semi structured interview there are different kinds of validation which could be used. The first one is external validation. This refers to the degree of how much the conclusion also counts for other projects. To contribute to this validity, by using the method of GTA, a high abstraction level is aimed for by using the highest codes in the code book.
Another form of validity is related to the trustworthiness of the data. This is taken care of by interviewing the persons in their own workplace, so it is a safe environment for them where they feel comfortable and do not need to adjust to a new unknown environment. Also, people belonging to different stakeholder groups are interviewed to prevent a tunnel vision.
Furthermore, the interviews were conducted one on one, with no other people in the same room, so they did not have to feel hampered in telling their story. Also, all the interviews are conducted within a short timeframe, so the stories that are told are looking back at the same project duration. This would be different if the conducted interviews were spread over a longer period.
The validity of the results is addressed in Chapter 6.

3.5. Research Ethics

When the interviewees were asked for the interview, which is on voluntary basis, they were informed of the goal of the interview, namely for research purposes. Also, the field in which the research takes place was mentioned. At the start of the interview they are asked whether they are okay with the interview being recorded. If they were not, this choice was respected. In that case, which happened once, extensive notes were made which were used to make a summary of the interview.
In the report the citations from participants are quoted anonymous to protect their right to anonymity and confidentiality. Names or references to characteristics of people in quotations are replaced with XX. The participants saying is indicated with 'R:…', whereby R stands for respondent. 'I:...' stands for interviewer, in this case the researcher, me.

4. Analysis

This chapter describes the procedure for analysing the interviews and is concluded with a graphical summary.

4.1. Analysis Procedure

The interviews are analysed using a qualitative analysis method. Therefore, the program Atlas.ti is used as described earlier in Chapter 2. For the analysis codes are used. The initial code list was made upfront, based on literature. This list is extended with new codes if the predefined codes do not fit. During this process the research question is kept in mind to prevent too much digression. The procedure of the analysis is described step by step in this section and is summarized in Figure 17.

1. Transcribe interviews
   The first step in the analysis, after conducting the interviews, was to process those interviews into written text. Therefore, it was necessary to transcribe them. This is done by listening back to the recorded interviews and typing them out word for word. This resulted in a total of 184 pages of data, which can be send on request.

2. Set up initial codebook
   For the analysis itself, codes were needed. Here, the term 'code' is defined as a descriptive label that represents the content of a piece of transcript. Therefore, an initial codebook is made up front. This was based on the literature which was used for the literature study. The focus was primarily on the *what* related to actions and the *moments*. This initial coding scheme can be found in **Fout! Verwijzingsbron niet gevonden.**.

3. Coding transcripts
   Now the preparation for the coding process is done, the actual coding of the transcripts could start. In case a pre-defined code did not match the selected text in the transcript, a new code is added to the list. This all is according to the open coding procedure. It is possible for a quotation to have multiple codes, since a text fragment can cover more than one topic. This is illustrated in Figure 14.

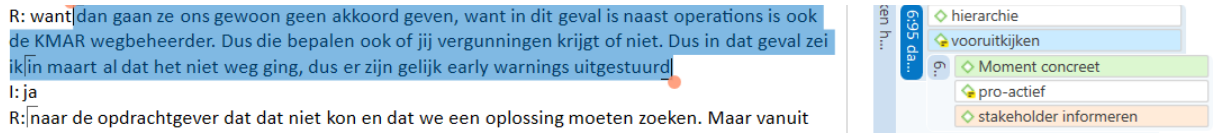

Figure 14: Multiple codes for the same text fragment.

4. Review codes, coded transcripts & refine codes during coding phase
   As the grounded theory dictates, after analysing each transcript document which reflects one interview, the researcher went over the codes and checked if codes have to be split up, could be combined or if family codes could be formed. Creating family codes is another way of combining codes. The difference is that with combining codes, two codes merge into one code, while a family code is a code in a higher abstraction level that covers the more detailed codes that belong to that family.

   The reason for 'cleaning up the code list in between' is to keep the focus and to avoid proliferation of codes. For example, after coding the first two interviews, this process resulted in a decrease in codes from 107 to 93 in total. To check coding for a possibility to merge or split, all the codes are sorted on the level of groundedness as shown in Figure 15. Groundedness means the amount of quotations labelled with that particular code. For codes with a grounded number of less than 3, the quotations are checked to see whether they could be merged with another code. This does not automatically mean that *all* codes with a density less than 3 are combined after this cleaning process. Sometimes they do not fit with another code, so they will exist by themselves.
   An example is the codes *'communiceren extern'* (communicate externally) with a density of 1. This quotation also fits together with the more general and bigger code '*communiceren'* and is therefore merged with that code.

Show codes in group **Tijdsaspect**

Name	Grounded	Density	Groups
Fases overlap	4	0	[Tijdsaspect]
Stap terug in proces	5	0	[Tijdsaspect]
tijdnood	9	0	[Tijdsaspect]
tender	29	0	[Tijdsaspect]
fase kenmerk	45	0	[Tijdsaspect]
proces~	52	0	[Tijdsaspect]
tijdlijn project~	54	0	[Tijdsaspect]
overleg~	69	0	[Stakeholder] [Tijdsaspect]
Moment concreet	90	0	[Tijdsaspect]

Figure 15: Family code, sorted on groundedness.

5. <u>Removing redundant codes</u>

The coding activity is an iterative process with a lot of going back and forward. At the end it seemed that some codings were redundant. Redundant codings are overlapping quotations that were associated with the same code. Therefore, after coding all the transcripts, the tool 'redundant codings' in Atlas.ti is used to remove those. An example of a redundant coding is shown in Figure 16.

If this step would be skipped, the groundedness of codes in the data would not be correct or less clean. What happens, is that codes are counted double, without covering a new text fragment. The result of eliminating the redundant codes is that the groundedness number and the total amount of labels used for a code is reduced. This eliminating process does not affect the total amount of codes in the codebook.

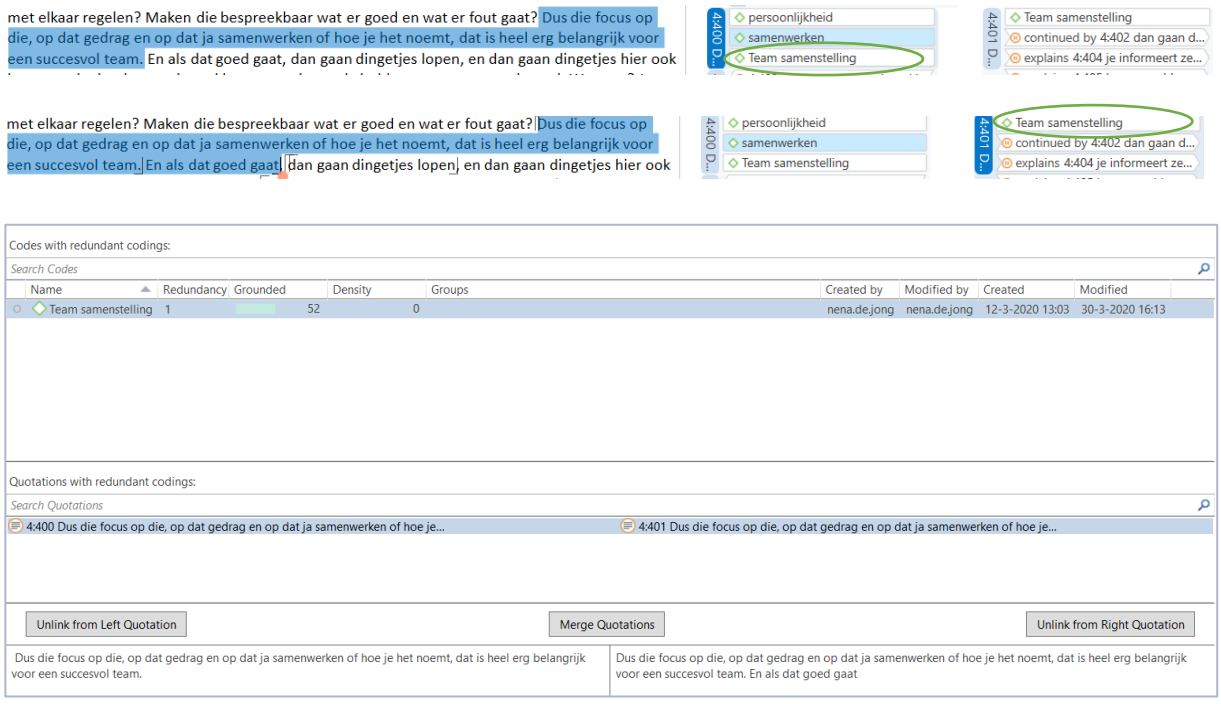

Figure 16: Redundant codings.

It is remarkable, but logical that most of the redundant codes were in the transcripts that were analysed first. This can be explained by the fact that in the beginning the transcript was interpreted very detailed. After coding the first two transcripts this seemed not to be the most useful way, because when the co-occurrence of two or more codes were looked at, this gave not much results while the codes did cover the same text part. This detailedness has been modified by the coded transcripts and the too detailed interpreting of the text is adapted for the coding process of the other transcripts. It can be named a lesson learned during the research process. For other researchers it would be useful to make use of redundant coding step earlier on in the process, so after each transcript is coded, because it helps you to have a cleaner dataset. The codebook after eliminating the redundant codings is the starting position of the next step.

6. Review codes, coded transcripts & refine codes

After eliminating the redundant codings, the codes themselves is looked at in more detail. Therefore, all the quotations belonging to that code are looked at again. In this stage of the research, not only the codes with a low groundedness number are reviewed (what is done in step 4), but also the meaning or definition of codes is revised. This leads to the following merging and splitting of the codes:

Based on groundedness

- 'Opbouwen relatie' had a groundedness of 2, that's not much. Therefore, those quotations are looked at again and it seemed they also fit with 'vertrouwen' and 'contact leggen'. This action made the code 'opbouwen relatie' disappear from the code list because its quotations were split and merged with the other two.
- The codes 'onervarenheid(2)' and 'onervarenheid gevolg(4)' also had a low groundedness number. A couple of those seemed to fit in 'issue / verbeterpunt' and 'samenwerken' or did not really add value related to the scope of this research. This resulted in eliminating the code 'onervarenheid' and a decrease of 'onervarenheid gevolg'.

Based on matching parts in the code name

- Thereafter, the code that stood out was everything with 'ervaring' (*experience*) in the description. This were 4 in total, namely: 'ervaring', 'ervaring intern', 'ervaring extern' and 'ervaring van zittende partijen'. 'Ervaring extern' is merged into 'inschakelen kennis' and 'informatieflow'. 'Ervaring delen zittende stakeholders' was merged with 'ervaring intern' + 'ervaring'. This leads to a decrease of two codes related to experience.
- The codes 'rolinvulling opdrachtgever' and 'actie opdrachtgever'. Multiple text pieces that were about the opinion Schiphol being not very up to date in their working process, were labelled with rolinvulling opdrachtgever. This seemed to have a better fit in 'project kenmerk' or 'belang opdrachtgever'. Other labels with rolinvulling opdrachtgever were merged with actie opdrachtgever because they were about actions and responsibilities from the client side. The same is done for the codes 'rolinvulling odprachtnemer' and actie opdrachtnemer' but then viewed from the contractors' side.

Based on meaning or definition

- The next code that was looked at is 'zelfkennis (7)' and 'persoonlijkheid (26)'. They are not so small as the code 'opbouwen relatie' which was split and merged, but in this case the meaning/definition of the two codes are very close to each other. To make sure there is a real difference in meaning between the codes, or that it is better to merge them together, those quotations are also looked at again. After reviewing those quotations, it seemed 'zelfkennis' can best be is split up and merged with other bigger codes such as 'verbeterpunt' and 'persoonlijkheid'. Also, this code 'zelfkennis' was removed from the code list.
- Two other codes that might raise a question because the meaning is close to each other are 'informationflow' and 'terugkoppelen'. It has both to do with transferring information. The co-occurrence table (**Fout! Verwijzingsbron niet gevonden.**) shows that both the codes had the same co-occurring codes. Therefore, after reviewing the quotations of 'terugkoppelen', this code is fully merged with 'informationflow'.
- For the codes 'signaleren' and 'vooruitkijken' the meaning is also very close to each other**.** The interpretation of those codes is substantially equal, therefore, 'signaleren' is merged into the bigger code 'vooruitkijken'.
- 'Stakeholders betrekken', 'stakeholders informeren' and 'stakeholder meekrijgen' is the next combination that is reviewed based on the meaning of the codes. 'For the quotations from code 'stakeholders betrekken, it seemed a lot could be merged with the codes 'stakeholders informeren' and 'stakeholders meekrijgen'. Stakeholders betrekken can better be seen as an overarching theme for 'stakeholders informeren' and 'stakeholders meekrijgen'. The difference between the last two can be explained as: 'stakeholder meekrijgen' then there is a dependence. So, you want the stakeholder to do you a favour. In case of 'stakeholder informeren' you provide them with information, there is not necessarily a quid pro quo that you expect, and is therefore more of a one-sided action.

- Tijd beschikbaarheid / tijdnood. 'Tijd beschikbaarheid' is about a specific moment or moments in time for a longer duration. This means this code also fits under the bigger code 'moment concreet'. Another consideration that contributed to merging those codes, was that 'tijd beschikbaarheid' only occurred in one of the transcripts, while the other text fragments with similarly content and was often used in combination with the code 'moment concreet'.

Based on meaning, not merged or split

- Prioriteren (*prioritise*) / stakeholders prioriteren. Prioritise emphasizes priorities to be made in the process. Stakeholders prioriteren is about which stakeholders are included and which are or are not involved. So, the first is focussed on the process, and the second on parties or stakeholder groups.
- Stakeholder tevredenheid *(stakeholder satisfaction)* / stakeholders botsen (*stakeholder clash*). This both has to do with the degree of satisfaction between stakeholders. The first one 'stakeholder tevredenheid' is focussed on satisfaction of stakeholders, the second 'stakeholders botsen' is related to stakeholder dissatisfaction.
- Stakeholders botsten / stakeholder eis (*stakeholder requirement*). In this case the distinction between those two codes is that with stakeholder clash we mean that stakeholders cannot agree with each other's thinking or action. Stakeholder requirement means that it concerns a stakeholder's must or necessity, so really about the stakeholder's point of view. This may result in a clash between stakeholders, which is covered by the other code.
- The difference between '*afwijking'* (deviation) and '*wijziging'* (change). In this study the term *afwijking* is used to point something out that is different than a regular situation. *Wijziging* relates to a change in the situation. The result of an '*wijziging'* can be an '*afwijking'* if the change is to something that becomes not standard. However, an *afwijking* cannot result in a *wijziging*, since there is no change in situation.
- Another label with a subtle difference is '*informeren'* (to inform), and '*communiceren'* (to communicate). The first one refers to information providing. This is mostly in a one-way direction. Communicate is not necessarily a one-way direction, but better resembles the form of a conversation. Those labels belong to the same code family, namely action. However, a distinction can also be made between internal and external communicating and informing.
- *'Pro-actief'* (pro-active) and '*vooruitkijken'* (looking ahead). In this case pro-active is related to an action. Looking forward refers to anticipating current actions with their impact on the future, so this can also be a thought or a remark.

7. <u>Analyse codes</u>

After the explanation of the codes and the use of codes, the relation between the codes is examined. With the Atlas.ti program, an overview of co-occurrences was made. A co-occurrence represents the overlap of codes in the same quotations. Also schemes of the situation and information flows are drawn. Those schemes can be found in Appendix F and show the complexity of the project.

With this information, conclusions can be drawn about which actions are related to which moments, which is what we are looking for to give an answer to the main research question of this research.

All the different steps of the whole analysis procedure are summarised and visualised in Figure 17.

4.2. Graphical Summary Analysis Procedure

The previous paragraph described the analysis procedure of this research step by step. This paragraph will conclude this chapter with a graphical summary of the described analysis procedure. At the end of the whole coding process, so after step 7, the codebook consisted of 85 codes which can be found in **Fout! Verwijzingsbron niet gevonden.**.

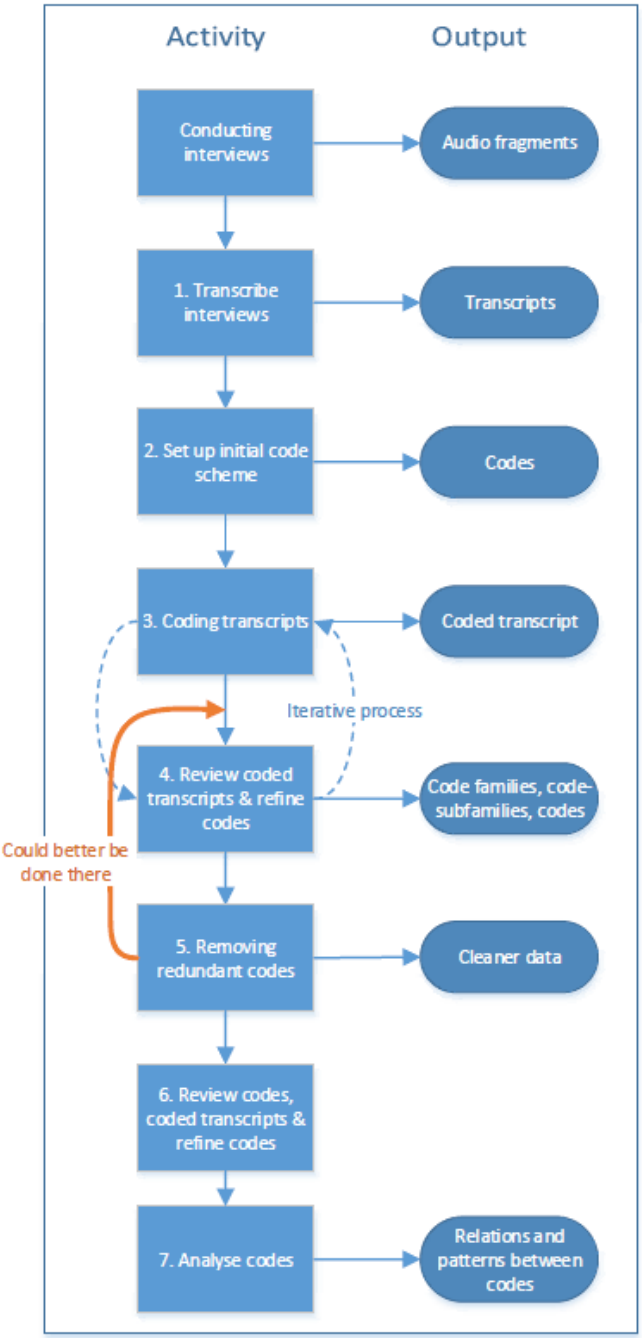

Figure 17: Graphical summary overview from analysis process (own illustration).

5. Results

This chapter captures the results of the data analysis. In addition to the interview transcripts, the data consisted of the content analysis documents, the literature study and the field observations. The main research question was:

What are we ***doing***, at which ***moment*** while ***aligning stakeholders*** effectively in infrastructure construction projects in a densely populated area?

Based on the data, three main finding categories can be distinguished. They are on the highest abstraction level: time, timing and timeliness. Those three categories are explained more in this chapter. To support the explanation, a visual overview of how the raw data led to the different code levels, which represent the finding, is used. At the end, those visual overviews are combined in Figure 24, where the connection between the findings is also visualised. Quotations from the transcripts are used whereby 'I' stands for interviewer and 'R' for respondent.

Timing

The term timing refers to the moment in time when something happens. Is this moment effective or not? Does it concern one moment or a repetition of moments? The analysis shows that timing can be split into two other terms, namely '**grabbing the opportunity**' and '**providing information'**. How those terms are defined in this research are further elaborated on below.

1. The first category that contributes to the timing of the executed works is '**grabbing the opportunity**'. This includes the activities '*To signal*' and '*To document*'. Below Figure 18 those activities are explained in more detail.

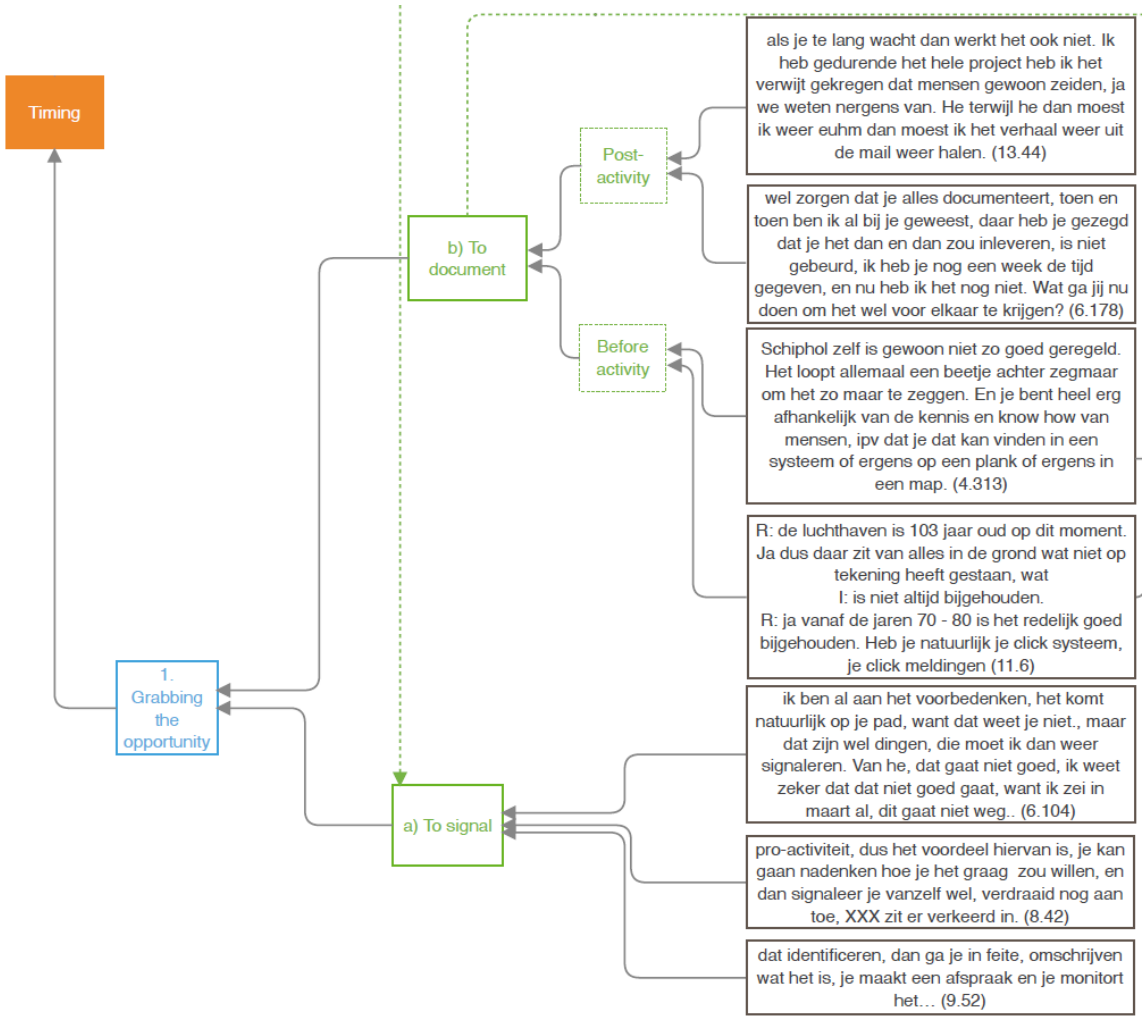

Figure 18: Analysis from raw data to aggregate code Timing part 1 (own illustration).

a) *To signal*

Timing of actions is relevant to make the outcome of the action desirable, or even effective. Therefore, one of the actions that contributes to aligning stakeholders is *picking up signals* and actually doing something with them. Picking up signals from stakeholders makes it possible to make changes in the design, before the specific design is executed. When neglecting those signals, it often occurs that a change has still to be made later on, which is more difficult. The reason why changes later on are more difficult, is that executing part of the work has already started and must be adjusted. Changing before the work has started is a lesser disadvantage.
As an addition, having a pro-active attitude, so not waiting until others have acted first but taking the lead, contributes to having less disruption from the stakeholders. Thereby they feel that they are heard and taken seriously.

From the studied case, a clear example of the added value of anticipating on signals picked up from stakeholders can best be described by the example of the ramp-up/down. The ramp-up/down is a part of the initial existing road in front of the arrivals / departures area, that was used by the Koninklijke Marachausee to get one level higher or lower with their vehicles. The initial plan was to remove this part of the road to make place for the building activities of the new road. However, signals were picked up that the ramp-up/down could not be removed due to safety requirements. By having a pro-active attitude from the contractors side and sharing this information with the client and also internally, the contractor could already anticipate and think of another approach or scenario. Half a year later, everyone indeed believed and agreed that it was no option to remove the ramp-up/down. Since the contractor knew this in advance and anticipated on this, there was already a plan B that could be used.

b) *To document*

Documenting is another activity that contributes to the timing of actions and therewith the results of those actions. Within the activity of documenting, a distinction can be made between *post-activity documenting* and *documenting before the project starts*.

First of all, post-activity documenting makes it possible to prevent redundant discussions by pointing back to earlier made agreements and action points.
Furthermore, documented information can help inform those who are not involved in the project from the beginning. This can be new employees or for example the contractor who only becomes involved from a later stage. The better the information is documented, the better it can be understood. Passing the information along to the party who is involved in the next phase makes it easier to understand why certain measures are taken. This information in both cases relates mostly to post-activity documenting, which includes making notes of meetings and events, and treatment of stakeholder requirements.
In addition, a good documentation of information also contributes to a consistent communication approach of the stakeholders. This means that the same answers are given to the stakeholders as were received before. Some stakeholders are more tenacious than others and are willing to try communicating the same ideas directly to the contractor if they did not come to an agreement with the client in an earlier stadium. Then, knowing the reaction given earlier to the stakeholders is useful to stay aligned with each other and stay on the same page as internal stakeholders. In this case, the timing of asking the questions from the stakeholders' side does not influence the answer.

Besides the post-activity documentation, if and how the processes and the area itself are documented in the beginning are also of relevance. Having this documented is important, since it provides guidance during the process itself.
Therefore, it is very helpful if the owner of the area has a clear documentation of that area. This is a source of information which is used for the execution of the works.
Also, before the real execution of the works starts, the contractor should have a clear view on why, what and how they are planning to execute the works. This likewise applies to the client, although on a different level. Those why, what and how questions should also be answered regarding the alignment of stakeholders. The three questions represent three levels of detail, starting with the strategic level,

representing the why question. Why is stakeholder alignment necessary in this project? The following, more detailed question is related to the tactical level. What are we planning to do to align the stakeholders? And the last one, the operational level which is related to the how question: how are we planning to align the stakeholders? In Figure 19, these questions are illustrated on the left side of the triangle. Starting at the blue dot in the middle of the top segment, the level of detail increases with each subsequent question, which is reflected by the shape of the triangle.
The right side shows the potential outputs which are related to the answers to the questions shown on the left. For example, the question of why stakeholder alignment is necessary is addressed in the document that describes the communication process or the stakeholder management process. Those answers are then also used as input for answering the next question. This makes the answers become more and more detailed.
Being able to answer those questions will result in a strong plan; the backbone of the project. It can be analogous to a real spine: if the spine is very weak, it is hard to stand up straight and move forward.

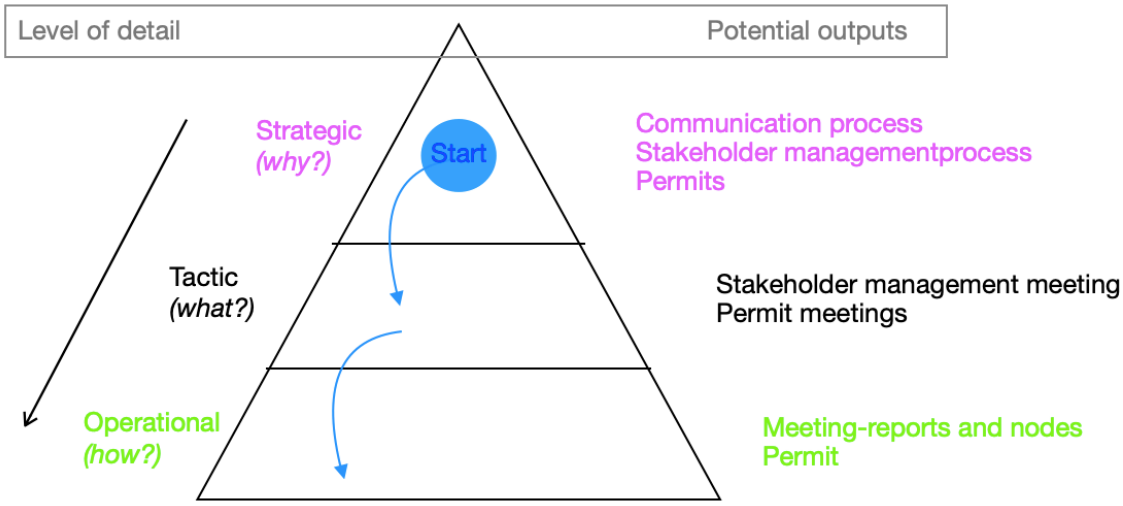

Figure 19: Pre-activity document guideline (own illustration).

The added value of good documentation is not only mentioned in the interviews, but also noted in the fieldnotes which are made during the research period. During meetings with other contractors (and the same client), notes were not frequently made. This resulted in some action points or promises having not been carried out, which does not contribute to a good alignment of stakeholders.

2. The second category that contributes to the timing of the executed works is '**providing information'**. This activity too, contributes to the degree of alignment of stakeholders, because when they are feeded with the right information on the right moment in time, their understanding of the project will grow. The information providing activity can be split into *having a meeting*, where a two-sided conversation takes place, and *sending information*, where information is sent one-sided. In both cases the problem of undertaking that action too early arises. How those actions are aggregated from the raw data is envisioned in *Figure 20*. The two actions, having a meeting and sending a message, are elaborated on more in detail below.

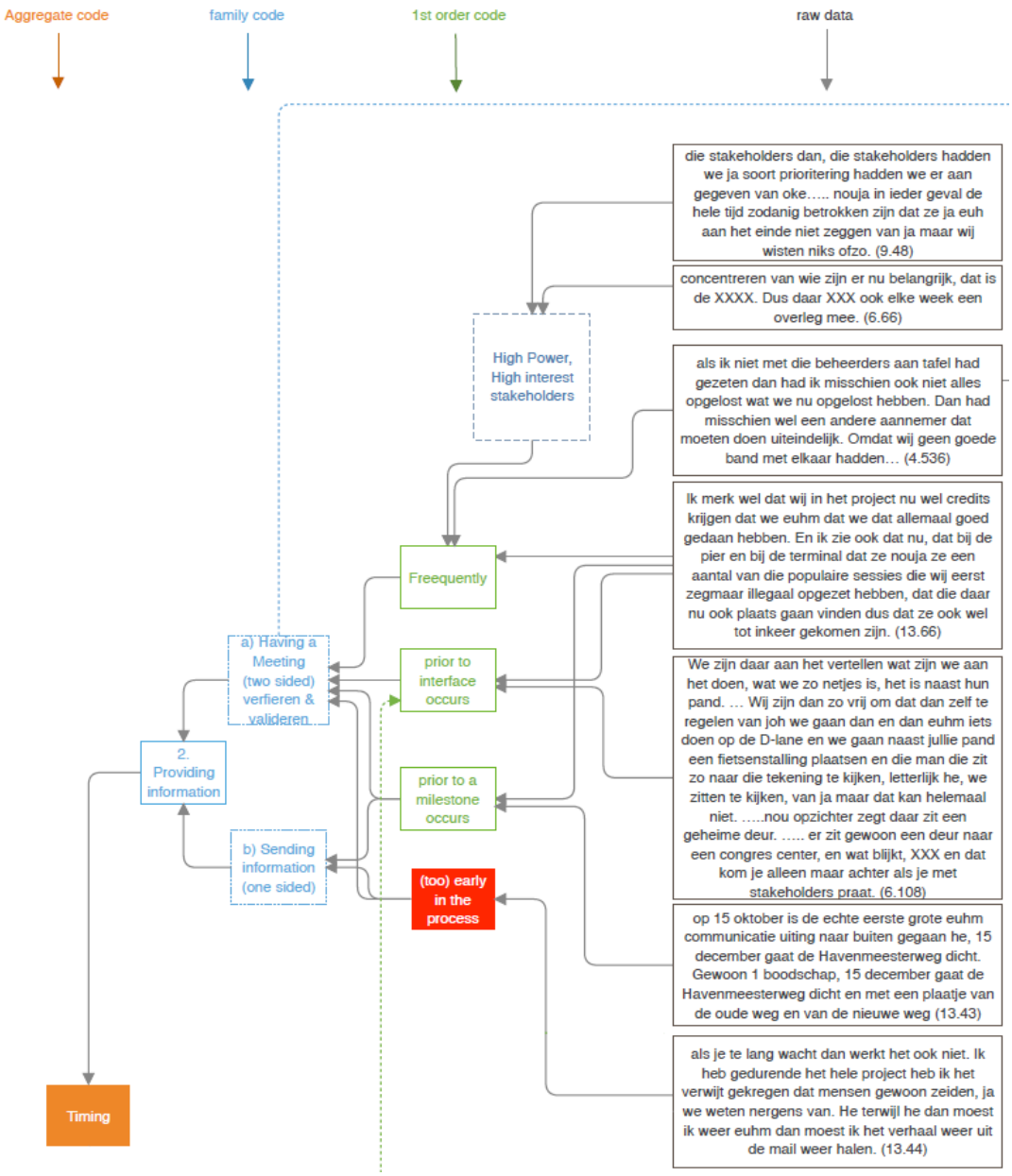

Figure 20: Analysis from raw data to aggregate code Timing part 2 (own illustration).

a) *<u>Having a meeting</u>*

The correct timing of *<u>having meetings</u>* does contribute to a clear information flow between the parties. There are several types of meetings during the project lifecycle. The type of meeting the stakeholder is invited to depends on the power and interest of the stakeholder. The stakeholders with a lot of power and a lot of interest, the so-called key stakeholders, should be invited to the *frequently planned meetings*, which are mostly planned every week. The stakeholder management plan, fieldnotes and the following quotation show it very clearly:

> *'heel erg gaan concentreren van wie zijn er nu belangrijk, dat is XXX, dat is XXX, die maakt uit of je dingen kan uitvoeren buiten. En euhm XXXX van XXX en XXXX. Dus daar heb ik ook elke week een overleg mee.'*

The frequency of the meetings is decided upfront in collaboration with the involved parties, and defining the intention of the meeting is essential. Are we talking about design, progress, the contract, the price, communication plan or do we discuss something else? Regarding the frequency, weekly is a good start for projects in a densely populated area, since there is a lot of activity there. When the end of the project is approaching and the completion of the execution starts, the frequency of those

meetings can be reduced. Reducing the frequency is always a decision that is consulted with all parties that are participating.

If an action affects a stakeholder separately, so *if there is an interface, a separate meeting* is set up with them before the work starts to inform the stakeholder about the activity. This can also be related to stakeholders who are not categorised as key stakeholders.
The effectiveness of such a separate meeting is clearly evident in the information that was gathered during a meeting where the intention was to inform the Sheraton hotel employees about the construction works taking place next to their building. During that meeting, the stakeholder shared their knowledge and said that a certain idea could not go through because it would block an emergency exit. By sharing this information, which came as a reaction to sharing the plans from the contractor's side, the contractor could think of another approach before the execution had already started. The quotation that describes this the best is as follows:

'R: We zijn daar aan het vertellen wat zijn we aan het doen, wat wel zo netjes is, het is naast hun pand. Wel netjes en dat had eigenlijk de opdrachtgever moeten doen. Wij zijn dan zo vrij om dat dan zelf te regelen van joh we gaan dan en dan euhm iets doen op de D-lane en we gaan naast jullie pand een fietsenstalling plaatsen en die man die zit zo naar die tekening te kijken, letterlijk he, we zitten te kijken, van ja maar dat kan helemaal niet.
I: ja
R: oke… nou opzichter zegt daar zit een geheime deur. Daar zit een deur, dat kan niet. Oke… hij zegt ja oke we gaan wel even verder, het moet gewoon gebeuren, maar dus wij maken het gesprek af en hij zegt loop maar even mee naar buiten. Dus wij lopen met hem naar buiten, zit een hele gevel, je zou het niet zeggen, je kijkt ernaar en denkt oke, en hij doet op een gegeven moment de deur open. Dus die hele hal die begeeft zich dan naar voren, er zit gewoon een deur naar een congres center, en wat blijkt, dat het Sheraton en dat kom je alleen maar achter als je met stakeholders praat.'

b) *Sending information*
A one-sided action that involves stakeholders who are not particularly categorized as key stakeholders is s*ending information* prior to a milestone. Too early of an involvement, so bad timing, seemed to be a problem because stakeholders forgot that they received the information and become confused by the many signals given. To avoid involving the stakeholders too early, the general time path for information providing is to start **2 months before the actual milestone date** with general information, which becomes more and more detailed when approaching the actual date. This approach seemed to work well.

What is apparent in this point of the results is that an effective regular timing of meetings and sending information does contribute to a proper information flow between internal and external stakeholders. This proper information flow makes it possible to carry out and complete activities on time, since a potential disturbance in execution is noticed upfront. The stakeholders are provided with the information they need at the right time. Then, immediate action can be taken to prevent big changes and thereby reduce delay or cost overruns. This is referred to as '**timeliness** of the work' and is explained in further detail in the next category.

Timeliness

The term timeliness refers to the punctuality of actions, and if activities are carried out or completed on their planned moments. Therefore, the ***information flow*** plays an important role. Having the right information on the wrong moment or the other way around is not useful. This term information flow can be divided into the actions of *building a relation* and therewith *trust,* and *performing checks*, the so-called *validation and verification*. How the raw data led to the codes on a higher abstraction level is visualised in Figure 21. Afterwards, the influence of the codes is explained and how they contribute to the timeliness concerning stakeholder alignment.

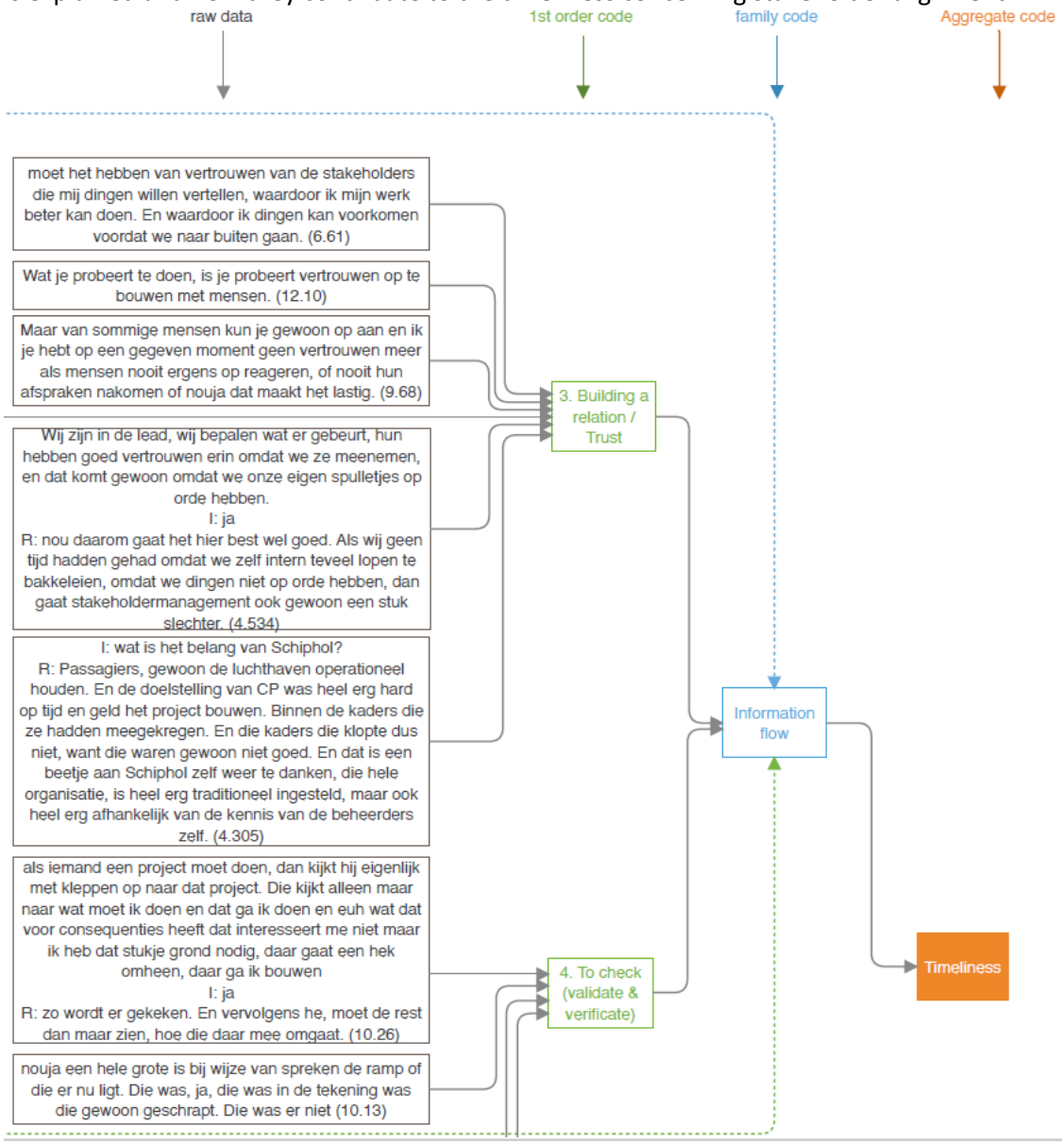

Figure 21: Analysis from raw data to aggregate code Timeliness (own illustration).

3. *Trust / building a good relation*

   Building a *good relationship* with the stakeholders is where one starts to get the information they need in order to be able to align the stakeholders with the construction of the project. The key is that people need to *trust* each other, otherwise the information flow will not start. This does not only apply to the relation with external stakeholders, but also to the internal project relation and even the team dynamics. The activities of the stakeholder manager are thus not limited to only aligning external stakeholders. The internal team management is just as important.

   In order to gain a good relationship and trust, having the same interest is crucial. Not having the same interest, based on the intentions given by the contract, is what can cause conflicts between different parties involved in the project.

4. *To Check / validation & verification*

In order to have a proper information flow, *performing checks* with the information is a necessary step, the so called *verification and validation*. The moment the information flow starts is already right at the beginning when the idea of the new work or project is born. The client has an idea and starts to gather requirements and translates those into a design, which will be put on the market. An overview of the information flow concerning how the stakeholder requirements are translated into specifications or needs and further into a design to achieve the final object, is shown in Figure 22.

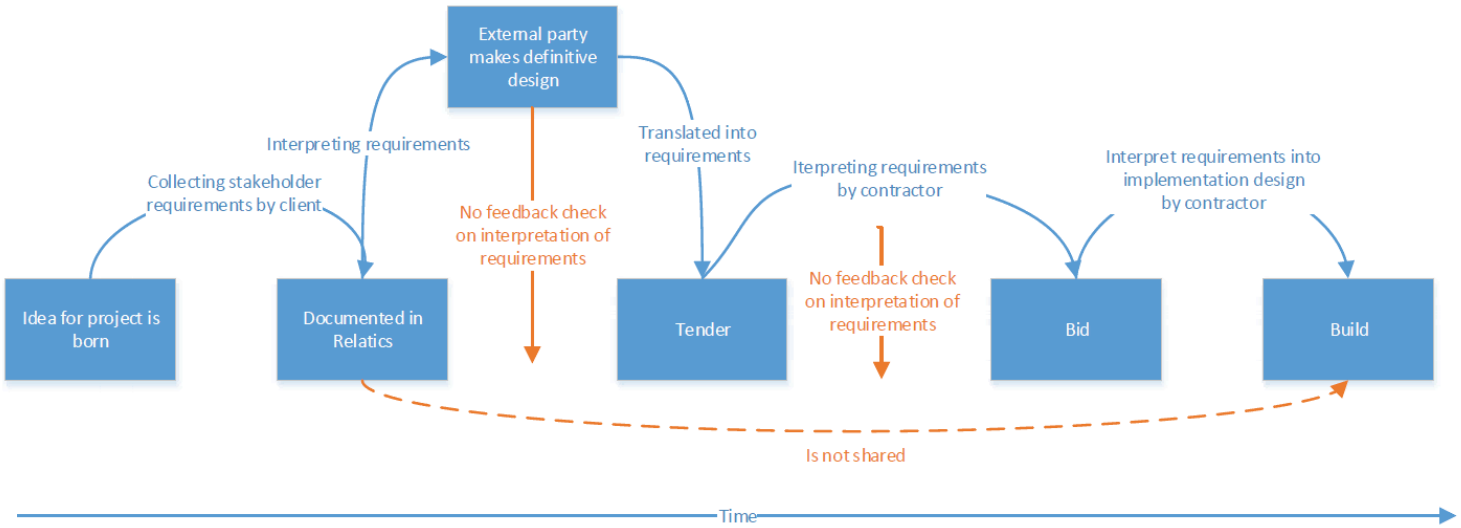

Figure 22: Interpretations of requirements (own illustration).

As Figure 22 shows, there are some critical points on the time path which relate to how the stakeholder requirements are dealt with. The information loss on the way can be compared with the children's game 'Chinese Whispers', where a group sits in a circle and a message is whispered on from neighbour to neighbour until it makes the full circle. This message is often no longer the same at the end of the circle. On the way, information gets lost or interpreted in a different way. This is also what happens over time with the early on collected stakeholder requirements. So many different parties interpret the requirements by themselves, without checking them with the stakeholders who gave them and also not with the end users.

The question then arises whether only the process was followed, or whether people also actively did something with the feedback gathered during the verification and validation. Regarding the *verification and validation* process it can be said that the box with that activity is checked, but what is done with that information is doubtful.
Furthermore, the verification and validation steps are carried out in the beginning with the project team members themselves, but not with a broader group of end users nor the ones from whom the requirements are collected. Consequently, people tend to stay focused on their own bubble. The next party who has to do the maintenance or build the next steps are not included. In this case for example, it is not only the passenger who can be seen as the end-user, but rather a group of end users consisting of more parties, such as the ones who need to keep the business running. The result of staying in your own bubble and carrying out the verification and validation only with the people who are already involved in the team results in a plan that not everyone is satisfied with. This was also fairly apparent at the beginning of the project's implementation when all parties were invited to sit around the table. This all supports that during the whole process, the stakeholders should not only be kept in mind, but also actively involved to stay aligned with each other. The sooner a misinterpretation of information is recognized, the sooner it can be corrected.

Time

The term **time** is related to the duration of activities. It can be defined as the period at which any definite event occurs such as the construction project itself or for example the period an area is closed to due to construction works. This event can also be referred to as the **process** and can be divided into the approach of the *informal* and *formal* process. Both have a relation with time since they both define how long the process takes and how it proceeds. Both those processes are elaborated on in this section. Figure 23 shows how the codes are represented by the raw data.

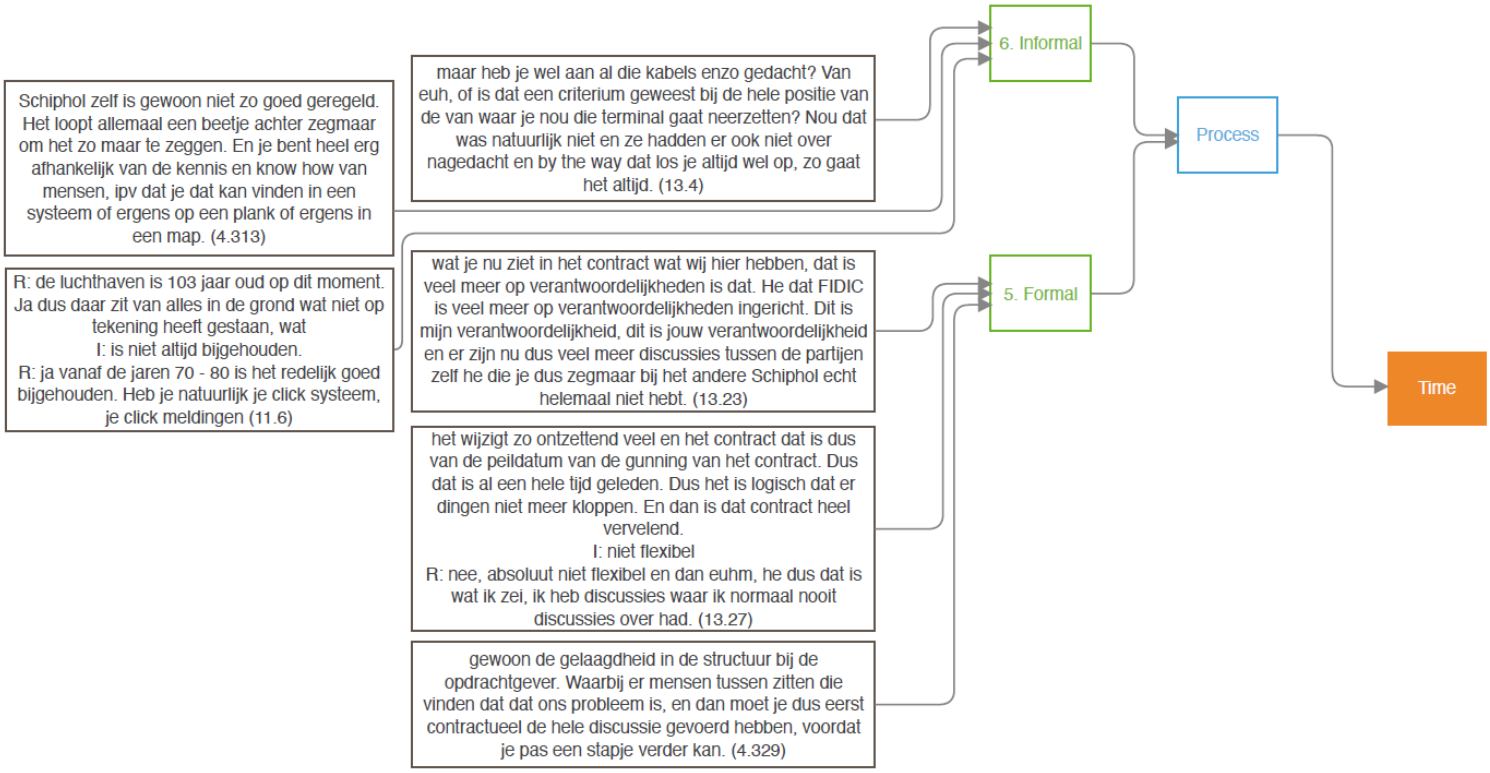

Figure 23: Analysis from raw data to aggregate code Time (own illustration).

5. The struggle of the **formal process**, it takes long.

   The formal process is defined by the contract type, in this case FIDIC Yellowbook. The contract type determines the way that the client and contractor should work together to realise the object. Requirements about stakeholder alignment are mostly included in a separate attachment and thus not a 'fixed part' of the standard contract.

   The relation and the level of trust between client and contractor defines the ease and time it takes to solve issues that suddenly pop up. This relation and trust are influenced by the type of contract and how both parties interpret the contract. This might sound strange, since a contract should be a mutual agreement and no doubts should rise. However, it seems that people look at the contract the way they want and are not always as good in looking one step further forward. For instance, the term FIDIC Yellowbook implies that it is a Design & Build contract, however, all the additions and changes make it to be a Construct & Build work. In this researched case, not everyone was aware of that difference, which resulted in unnecessary discussions and an extension of the duration of the project.

   Another issue with the formal process is that persons are placed on a role that does not suit them more frequently than one might expect. This leads to frustrations and works against the process, which makes moving to the informal network more attractive. In addition, the many layers in the organisation do not contribute to a short processing time either.

6. Power of the **informal process**, the quick fix.

   Besides the formal network, the informal network also plays a role by defining the time activities take. People regularly fall back to their informal network to solve problems instead of following the formal

procedures as described at the end of the previous formal structure paragraph. This phenomenon has different reasons.
Firstly, this is due to the lack of documentation of procedures at the location of execution. To prevent falling back to the informal network, the earlier mentioned topic about documentation plays an important role here too.
Secondly, the employees have worked together at the company for a very long time. This contributes to being able to build up a strong informal network.
The combination of these two points led to a strong informal network that built up over time, where everyone knows how to navigate their way to the information they need. People are used to working a certain way and changing that cannot be accomplished in one day. This is mainly encouraged by the fact that when something happens, the time that people have to react to such a situation is preferably not long. The formal way of collaborating to come to a solution takes long in terms of duration as described in point 5. Switching to your informal network is faster, more familiar and also solves the problem. It could be asked whether it is a bad thing that people use their informal contacts in favor of skipping the formal path in their work. At the end of the day, all the parties want to complete the project with the least path of resistance. It might be that the formal process is more often seen as a guideline, and not as a mandatory usage.
As also with other results of this research, this finding was observed and came forward multiple times in the interviews. The observations were not only during meetings, but also outside the official work hours.

Visualisation of findings

Figure 24 gives an overall overview of a part of the raw data in relation to the codes obtained. As can be seen from the green and blue dotted lines, the family codes and first order codes are also related to each other. This means that the time, timing and timeliness are likewise related to each other. By changing, for example, the action having meetings, not only will the aggregate code timing be influenced, but also the information flow and therewith the timeliness of actions. This is also the case for documenting. When that action is improved, the information flow will also change. This is something to keep in mind when changing one parameter in the process.

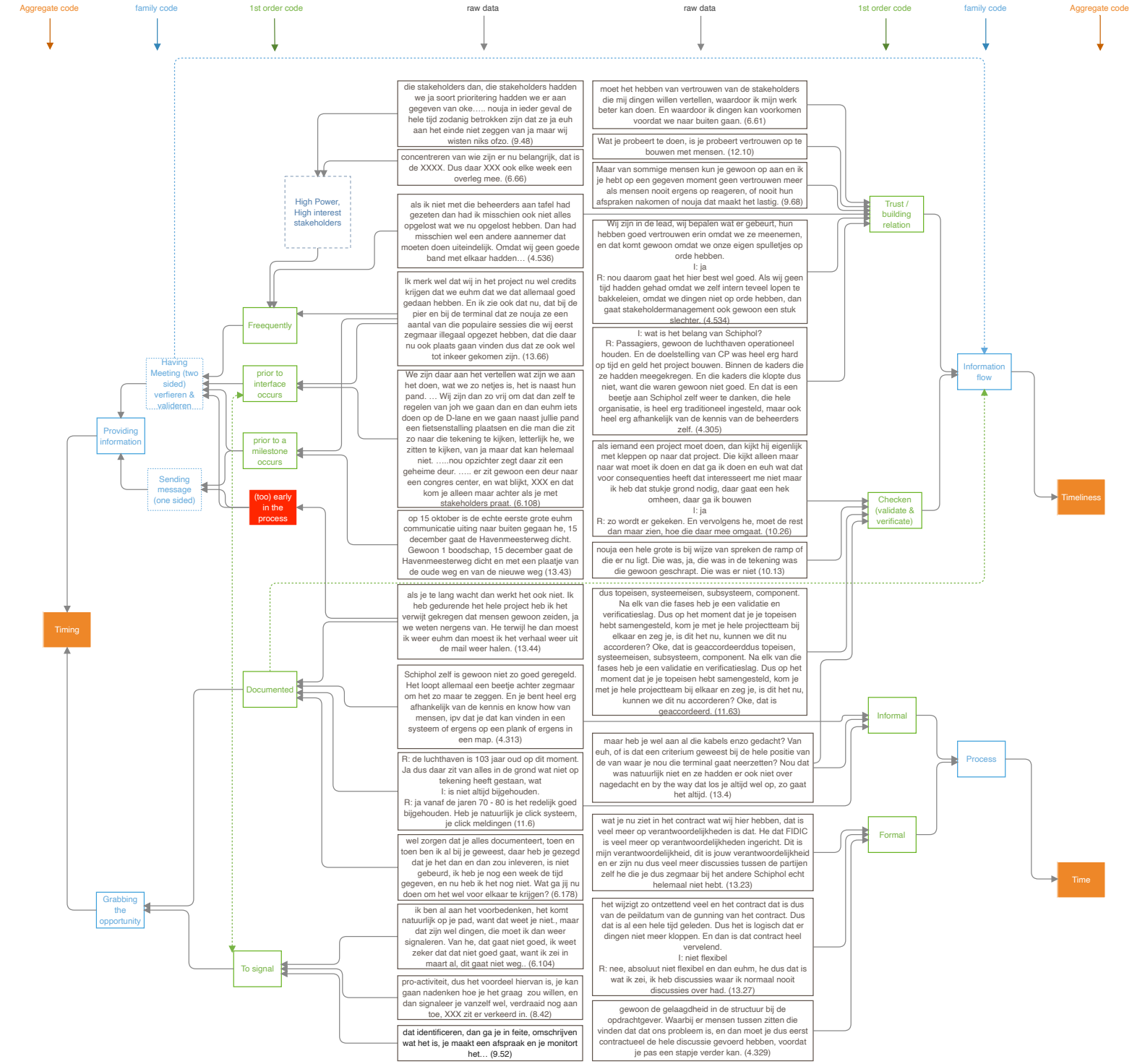

Figure 24: Visualisation of data processing (own illustration).

6. Discussion & Recommendations

The findings and limitations of the research are discussed in this chapter. This starts in section 6.1 with the validity of the results, followed by section 6.2 with reflecting on the results by using the findings of this research in relation to findings from earlier performed research. The last section, section 6.3, of this chapter discusses the limitations of this research and further recommendations. The recommendations are split into recommendations for future alignment of stakeholders and for future research.

6.1. Validation

After having analysed the data and forming them to results, the last step is to check whether the results on which the conclusion is based are correct. Therefore, the preliminary findings are used as input for the expert validation. This sections first explains the method used to validate the results, followed by the results of the validation.

6.1.1 Validation method

For the validation a summary of the results, is send to all the interviewees. The question asked was whether, in their view, they agreed on the findings, or if there were inaccuracies in the results. The reason why was also asked for, so that their opinion could be explained. They were also asked if any additions should be made, and again why. It was deliberately chosen to validate with them, since they are very closely involved with the case. However, to prevent a bias with respect to the research itself, also stakeholder managers who were not involved in this case were asked for the validation.

6.1.2 Validation result

The general feedback was that the aspects described in the content were correct; people agreed with it. However, the order and structure that it was presented in was not clear. Questions about what the researcher understood by a stakeholder were not clear. With this outcome of the validation, the results were formulated sharper and were attempted to be visualized. This helps to understand where the higher abstraction level codes come from.

One significant remark about validity needs to be made about the period that this study was carried out in, and the influence of the measures implemented as a response to the SARS-CoV-2 (coronavirus) pandemic. The interviews and observations were carried out before the measures went into effect. This means that the way that people work nowadays has rapidly changed, which has much to do with how the location shifted from the workplace to employees' homes. It is likely that after further relaxation of measures, the positive experiences of working from home will be carried over to the new standard of living and working, referred to as the 'new normal'. How this will influence the results of this research is not known yet, since it is not yet known exactly how the 'normal' will change to the 'new normal'.

6.2. Discussion of the Findings

This section reflects on the findings of this research by using earlier completed research by others. The contribution to the current body of knowledge is also addressed in this section.

Results in relation to 'early stakeholder involvement theory'

As the results in the previous chapter show, it is of importance to inform stakeholders on time. This means that the **timing of providing the information** should be correct. So far, this is nothing new. Earlier research, such as Yang, Nguyen and Molwus, also mentioned the effect of communication as one of the critical success factors for construction projects (Molwus, 2014; T. S. Nguyen & Mohamed, 2018; Yang et al., 2010). Molwus added the time factor 'frequently' by formulating it as 'communicating with stakeholders properly and frequently'. However, regarding the concept of what is on time or frequent enough, research is not clear yet. A well-known aspect related to the timing of stakeholder involvement is the term early involvement. It is always striven for, because trying to involve stakeholders after starting to execute the work is pointless. However, a clear answer on what *early involvement* exactly is, is not clear in literature. Where some say you should start as early as possible (Missonier & Loufrani-Fedida, 2014; Yang et al., 2009), others only mention the project phase that you should start involving the stakeholders to align them with your project, or simply just say "start early" (Jussupbekova & Pak, 2017).

Thereby, the added value by this research comes into view. It shows that early involvement is too ambiguous. The definition of early is not the same for everyone and besides that, it can also be *too* early. The disadvantage of too early of an involvement is that stakeholders forget the information that they already received and get confused by all the signals that are given. Therefore, the use of a clear communication scheme is recommended. The general message should be provided at the start, and more detailed information closer to the actual milestone date. This would contribute to involving and aligning the stakeholders in an effective way, since they know what they can expect. It can be seen as providing the information density based on an inverted funnel; starting small and generic, and ending wider and more detailed.

Applying the results to the V-model

The results can be discussed by applying them to the V-model (Figure 25), also known as the verification and validation model. During the whole project (**time**), there are different phases. The left side represents the design and preparation phase, which is mostly done by the client, while the right side represents the execution of the work by the contractor.

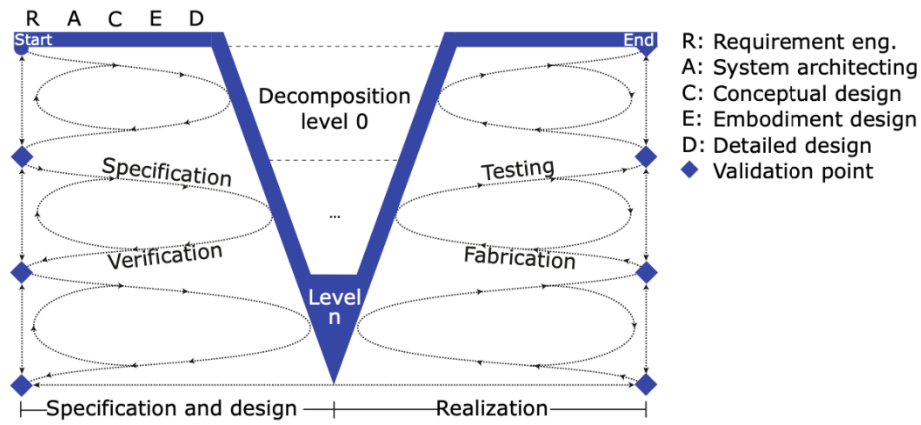

Figure 25: V-model (Wilschut, 2018).

The moments in which decisions are made or bigger events happen are crucial points. Therewith, the **timeliness**, so the punctuality, of the verification and validation of the decisions and events play an important role. Although the V-model in Figure 25 shows that those actions happen in the specification and design phase, this research shows that they are just as important in the realisation phase. The reason for this is that it is also desirable to keep the stakeholders aligned during the execution of the works, because that is the phase with the highest chance of disturbance for the stakeholders. Not having the verification and validation on time results in an incorrect information flow. An incorrect information flow does not contribute to building a good relation or trust with the stakeholders. This is something that can cause misalignment of the stakeholders with the project. The importance of trust is also addressed in earlier research, which mentions that collaborative relationships should be based on trust (Suprapto, 2016). Koops (2017) mentions the issue with a lack of trust; due to a lack of continuous open communication among the stakeholders, a good relation between all stakeholders cannot be formed. This research confirms that building trust and having a good relationship with stakeholders are important.
What previous research does not show is by which actions this trust can be gained. That is where this research comes in and contributes to the knowledge gap. A way to reach a good relation is thus by having regular meetings, even if you think that there are no major issues to talk about. There is a strong relation between having meetings, building trust and having a good information flow. These three all influence each other.

Another factor that is related to trust is that it has to be built up over **time** and is not something that can be forced in the beginning. Because of the duration it takes to build up trust, there is the risk that people will quickly revert to the informal network in tense situations. The reason for why people tend to fall back to their informal network is not looked at in detail in this research, but is a finding that stands out in the data. The article written by Bryan et al. concluded that the formal structures of companies, as manifested in their organisational charts, do not explain how most of their real day-to-day work gets done (Bryan, Matson, & Weiss, 2007). This indicates that the phenomenon having occurred in this case study is not unique. However, the reasons why people tend to prefer using their informal network is not often addressed in literature. The possible explanations based on the observations made in

this research are explained in Chapter 5, and were based on the combination of the fact that employees have been working for the same company for so long so they know what to expect from each other, and insufficient documentation. This lack of documentation can be led back to the V-model and the information flow. Not only are the actions of the verification, validation and giving feedback themselves important, but documenting those actions are also important to help align the stakeholders. As the V-model shows, the left and right side of the V are related to different phases, where different parties are involved. The client starts, and the contractor is involved in a later stadium. This does not mean that the contractor does not need to know what was communicated with the stakeholders beforehand. Therefore it is important to document the steps and decisions that are made and also share those documents.

Using classification of stakeholders
What the results also show is that not every stakeholder should be involved in the same way. Here, the stakeholder classification models come in use, such as the power interest matrix mentioned by Newcombe (2003). The key players, stakeholders with high power and high interest, should also be involved during the specification process (the next step after the validation point in the V-model). This is the phase were the decision or event is prepared. The **timing** of the meetings that facilitate this involvement should be organised frequently. How frequently depends on the complexity of the activities. A good guideline to start with is once a week, however, everyone involved should approve of the frequency. So, if someone wants to make a distinction in frequency which was defined upfront, then this should always be decided on in collaboration with the other parties involved in the meetings. It is possible that one person does not have important updates, but someone else does.
Something that is just as important as the verification and validation beforehand, is the **timeliness** of feedback given afterwards. The feedback informs the stakeholder of what the decision has become and especially what has been done with the stakeholder's requirements or concerns. This is something that is not included in the V-model, although it seems to be a very necessary action. It contributes to a better understanding of the process by the stakeholder.

6.3. Limitations of the Research

- Although the single case study allows the researcher to investigate a topic in close detail, the researchers' **own subjective feelings** may influence the analysis results. Different researchers might result in different outcomes. By describing the research process in a transparent way, this risk is narrowed. But that does not change the limitation of the way the researcher looks at the data. This might be influenced by background factors such as culture.
- **Culture** is also another limiting factor if the results are willing to be used in other boundary crossing airport projects. Although the client is a very international and multi-cultural organisation, this does not apply for the stakeholders that the organisation has to deal with.
- Due to the measures introduced in response to the **SARS-CoV-2** (coronavirus) pandemic halfway through this research, the research approach had to change a little bit. The interviews were already conducted and most of the observations were carried out. However, the validation process came after the measures. The validation would preferably be carried out in a face to face expert meeting where the findings would be discussed. Unfortunately, this was not possible.

6.4. Recommendations

6.4.1 For Future Alignment of Stakeholders in Infrastructure Projects

- What is seen to be very effective is to sit at the table with the client immediately after the tender is awarded. This relates back to Figure 22, which shows the many moments where misinterpretations may have occurred. If this is the case, it is better to clarify them as soon as possible. Making changes in a design later on in the process is more costly than in the beginning.
- For the client it, is recommended to not limit checking the processing of the requirements to only within the project team itself. Broadening the validation and verification group to also the stakeholders where the requirements were collected, and also the end users, would contribute to end result have the intended

purpose. Something that should be paid attention to, is that the end user in this case is not only the end user, but also the one who has to carry out maintenance and keep the business running.

- A project has a core team, with its core functions. A recommendation to further improve stakeholder alignment is to include the stakeholder manager in the core team. This is because this person has an essential role in passing on the correct information to the correct stakeholder. This can also be passing on information internally. A better term for the stakeholder manager could be information manager, since the activities undertaken by the stakeholder manager are not limited to only having a cup of tea and talk with the external stakeholders in the project.

6.4.2 For Future Research

In the discussion chapter, limitations of the research came to light. This indicates that there are recommendations for future research when investigating the pattern of effectively aligning stakeholders in infrastructure projects.

- The **generalizability** is considered to be low due to the single case study approach. Therefore, Future research could focus on doing a comparative case study on another infrastructure project in a densely populated area.
- During this research the importance of stakeholder involvement and alignment in the **earlier project phases** seems to be standing out. In this phase, the client is in charge of the process until they put the tender on the market. The role of the client in aligning the stakeholders before the tender is put on the market is interesting for research, since it determines in which state the alignment is when the construction starts.
- **A change in satisfaction level.** This research was focused on a case with a high satisfaction level of the stakeholders. For future research it would be interesting to select a case with a low satisfaction level of the stakeholders. By comparing the outcomes of both studies, the influence of the different possible approaches can be identified.
- A **change of perspective**. In this research, the alignment was researched from the viewpoint of the contractor. Therefore, it would be good to also investigate the clients' contribution to align stakeholders. The clients might be driven by other factors and thus result in another approach.
- In the coming years, more data is gathered about stakeholder satisfaction via the Stakeholder Journey or comparable stakeholder satisfaction measuring techniques. At that time, it would be of added value to conduct a **quantitative research** regarding the patterns of satisfaction and the characteristics of the projects.
- The time spent at the location was enough to get a rough feeling and impression of how things were done. However, to get a better overview and insight to the details, a next researcher could **spend more time at the location itself and also divide the time between the different stakeholders**. This results in a better understanding of the stakeholders and their behaviour. A good understanding was gained of the contractors' side, but the research as a whole could be improved by working at the other offices of the key stakeholders to reach the same level of understanding.
- It would be better to have a **validation session** where all the experts would come together to discuss the preliminary findings, unfortunately this was not a realistic option due to the corona measurements.
- According to the discussion, the verification and validation steps were not properly carried out. The reason therefore can be speculated on, but it would be useful to have insight in where the **bottlenecks of properly using this validation and verification** method lies. This is because a proper use, can contribute to have stakeholders aligned with the project from the start and creating added value that way.
- The discussion addresses also that people tend to prefer using the internal network besides the formal process. Why this happens and what people think the benefit of this move is regarding to their alignment, should be investigated further.

7. Conclusion

This single case study aimed at answering the following research question:

***What** are we doing, at **which moment** while aligning stakeholders effectively in infrastructure construction projects in a densely populated area?*

In order to investigate this pattern, nine semi-structured interviews were conducted. This number was reached by following the approach of Galvin (2015) and Guest (1995) about when saturation in conducting interviews is reached. To be able to answer the main research question, two sub questions were formulated. Those will be addressed first, before ending with answering the main research question.

1. *What are the main actions in order to align stakeholders?*

The main actions performed to align stakeholders differ per stakeholder group. For the key stakeholders, frequently having meetings is the main action. It is necessary to keep them involved in the process. The frequentness is the key in having those meetings. It is very important to check the information, the verification and the validation during those meetings. This can be in the form of updating each other about what is done and what is planned to be done. By sharing this information, the contractor can be ahead of a potential conflicting situation with a stakeholder.
Stakeholders who do not belong to the group of key stakeholders, should not be forgotten. This group should be informed about milestones. Here the commonly used term early involvement comes up. A period of two months before the major event is a good moment to start with the first general message, which becomes more detailed as the major event comes closer.
Another main activity is documenting. As a result of documenting, it is clear what has been talked about and agreed upon. People are therefore less likely to forget their tasks and agreements. It is also useful for potential new people, who can catch up on the history of activities, and get a better picture of what is currently going in.

2. *When do the main actions, related to stakeholder alignment, occur?*

This sub-question is related to the *when* part of the research question. An infrastructure project in this study is divided into the initiation phase where requirements are collected, followed by the design phase, tender phase, construction phase and finally the operation and maintenance phase. The initiation phase and design phase are phases where the contractor is not involved yet, so is outside the scope of this research. During the tender phase and execution phase, the influence of the contractor is noticeable. Before the actual execution of the work starts, it is wise to make a stakeholder approach based on three levels. The first level is strategically, it answers the question why stakeholder alignment is important to carry out. The second level is a tactical level and focused on what the plan is according to stakeholder alignment. The last level is the operational one, with the focus on how stakeholder alignment is carried out. Those questions lead to outputs as shown in Figure 22. Furthermore, the employees' preference to solve problems via their informal network should not be underestimated in companies where people have been working for a long time.

To conclude, the main research question is a combination of the two sub questions:

***What** are we doing, at **which moment** while aligning stakeholders effectively in infrastructure construction projects in a densely populated area?*

To align stakeholders effectively it is important to have a clear idea of what the approach will be from the very start. Therefore, a project management plan is written, including a section about how stakeholders will be aligned. This plan is based on three levels with each their own questions and output.
When the executing work starts, staying in touch with each other and knowing what is going on is very important. Therefore, different strategies, related to the type of stakeholder can be defined. The key stakeholders should be kept in touch with on a regularly basis to build trust and a good relationship which contributes to a proper information flow. The frequency of those meetings is defined together. When the project is reaching the end, this frequency can be lowered. For stakeholders who do not fit in the category of key stakeholder, providing general information 2 months before a big event is recommended. Within those two months, specifying and sending the

information frequently while reaching the date of the milestone is part of the plan. Also, when the construction works take place very close to the location of the stakeholder, a separate meeting is set up to inform this stakeholder about what will be happening there.
In all the cases mentioned above, documenting what is spoken about and which agreements are made is important.

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Appendix A

Overview of the critical success factors from literature about critical success factors in construction industry.

(Nguyen et al., 2004) A study on project success factors in large construction projects in Vietnam	(Yang, Shen, Ho, Drew, & Chan, 2009) Ranked on importance.	(Yang et al., 2010) Critical success factors for….. based on	(Molwus, 2014) Critical Success Factors for stakeholder management in construction projects
Clear objectives and scope	Managing stakeholders with social responsibilities (economic, legal, environmental and ethical)	Undertaking social responsibility	Clearly formulating the project
Commitment to project	Exploring stakeholders' needs and constraints to projects	Defining project mission	Ensuring the use of a favorable procurement method
Top management support	Communicating with and engaging stakeholders properly and frequently	Identifying stakeholders	Carefully identifying and listing the project stakeholders
Timely, valuable information from different parties	Understanding the area of stakeholders' interests	Understanding area of stakeholders' interests	Ensuring flexible project organization
Effective strategic planning	Identifying stakeholders properly	Exploring stakeholders' needs and constraints to projects	Identifying and understanding stakeholders' areas of interests in the project
Awarding bids to the right designer / contractor	Keeping and promoting a good relationship	Assessing stakeholders' behaviors	Determining and assessing the power (capacity to influence the actions of other stakeholders); urgency (degree to which stakeholders'' claims requires immediate attention); legitimacy (perceived validity of claims); and proximity (level of association or closeness with the project) of stakeholders.
Continuing involvement of stakeholders in the project	Analyzing conflicts and coalitions among stakeholders	Predicting the influence of stakeholders	Appropriately classifying stakeholders according to their attributes / characteristics
Frequent progress meeting	Predicting the influence of stakeholders accurately	Assessing attributes of stakeholders	Predicting and mapping stakeholders' behaviors (supportive, opposition, neutral etc)
Adequate funding throughout the project	Formulating appropriate strategies	Analyzing conflicts and coalitions among stakeholders	Predicting stakeholders; potential influence on each other

	to manage stakeholders		
Availability of resources	Assessing attributes (power, urgency, and proximity) of stakeholders	Compromising conflicts	Predicting stakeholders' potential influence on the project
Absence of bureaucracy	Compromising conflicts among stakeholders effectively	Promoting a good relationship among stakeholders	Identifying and analyzing possible conflicts and coalitions among stakeholders
Community involvement	Formulating a clear statement of project missions	Formulating appropriate strategies	Resolving conflicts among stakeholders effectively
Clear information and communications channels	Predicting stakeholders' reactions for implementing the strategies	Predicting stakeholders' reaction	Managing the change of stakeholders' interests
Accurate initial cost estimates	Analyzing the change of stakeholders' influence and relationships during the project process	Analyzing the change of stakeholders	Managing the change of stakeholders' influence
Systematic control mechanisms	Assessing stakeholders' behavior	Ensuring effective communication	Managing the change of relationship among stakeholders
Competent project manager			Managing change of stakeholders' attributes
Multidisciplinary / competent project team			Managing how project decisions affect stakeholders
Comprehensive contract documentation			Predicting stakeholders' likely reactions for implementing mission
Up to date technology utilization			Involving relevant stakeholders to redefine (refine) project mission
Proper emphasis on past experience			Formulating appropriate strategies to manage / engage different stakeholders
			Keeping and promoting positive relationships among the stakeholders
			Communicating with stakeholders properly and frequently (instituting feedback mechanisms)
			Considering corporate social responsibilities (paying attention to economic, legal,

			environmental and ethical issues)