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Organizational Barriers for Adopting Project Alliancing

an investigation in the Dutch public infrastructure procurement organizations

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Colophon

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Executive Summary

Problem analysis

Relationship contracting has been developed as a solution for the many challenges that complex projects face. Project alliancing (PA) is considered by many scholars as the most complete form of relationship contracting due to being a self-standing project delivery method. Unlike partnering which only relies on moral agreements, PA aligns the interests of the stakeholders and eliminates the adversarial behavior by providing the right contractual arrangements. This facilitates the development of soft skills, as early as possible, in the integrated project team.

There are many literatures devoted to project alliancing, mentioning its benefits and promoting the use of it. Yet there are little to no literatures available with regard to adopting project alliancing in the organizations. This void has caused the organizations that are convinced of the benefits of project alliances and have had successful experiments with it, to be facing difficulties in actually adopting it as an option for their project delivery.

In the Europe, the Netherlands is one of the pioneers in project alliances; three Dutch public organizations have had successful experiments with PA, the first one being in the year 1999. Yet after almost 15 years and 5 experiences, no public organization in the Netherlands has successfully adopted PA. This indicates the existence of barriers for this purpose.

Research process

With regard to the defined problem, the objective of this research is to identify the barriers of adopting PA in Rijkswaterstaat, one of the Dutch public organizations which have had a successful experiment with PA. Based on the preliminary research, it was decided to focus on the internal (organizational) barriers for adopting PA in Rijkswaterstaat. Consequently the following research question was defined:

"What are the (most critical) organizational barriers for progression of project alliancing from an experimental tool to an effective project delivery system for Rijkswaterstaat as a public entity?"

In order to answer this question, three sets of interviews, 27 in total, were conducted; an internal project personnel, an external project personnel and a validation round between the decisive functions for adoption of PA in Rijkswaterstaat. By conducting a thorough literature study, 25 theoretical barriers were identified. These potential barriers were used to design an interview protocol to be used in the interviews.

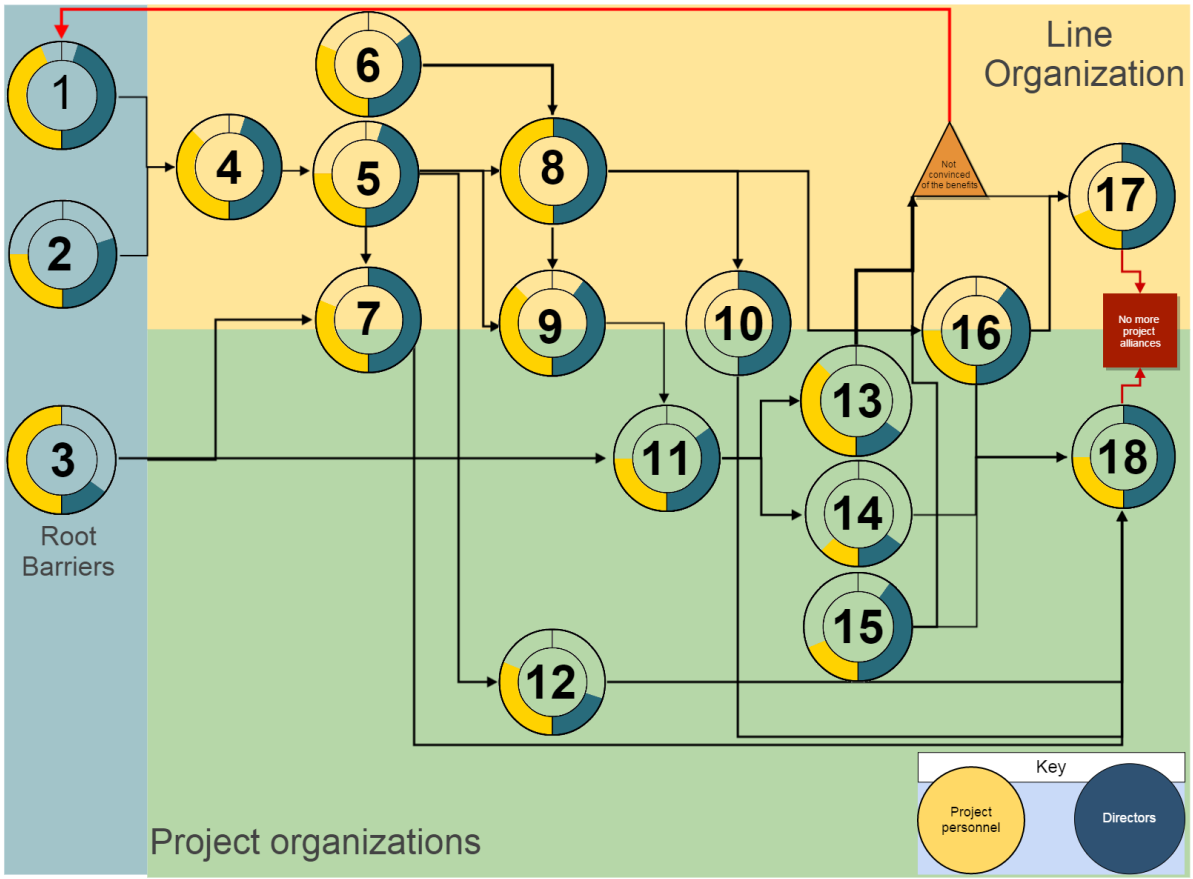
Conclusion

The results of the interviews point to 18 barriers for the adoption of PA in Rijkswaterstaat according to the project personnel of A2Hooggelegen (the pilot project of PA) and the line organization. These barriers are:

1. No clear policy towards PA
2. External influences (political)
3. Shortage of personnel
4. Not a priority
5. Not enough leadership/initiation from the directors
6. Unforeseen next step (process planning)
7. Not enough promotion for PA
8. Not enough investment in knowledge

9. Not suiting organization culture
10. No systematic development process.
11. High level of friction between the alliance and the main organization
12. No standard framework available for PA
13. Backlashes of the experiment
14. Operational problems
15. Complex observability of advantages of PA
16. Accountability concerns
17. Lack of champions
18. Not enough motivation for the project teams

These barriers have a degree of cause-effect relationship and therefore cannot be seen as isolated barriers. Barriers numbers 1 to 3 are considered the root barriers, and the rest of the barriers concern the line or the project organizations in Rijkswaterstaat as shown in the figure below.



Interestingly it can be observed that the barriers are mostly stemming from the organization itself rather than the projects; only the two barriers 'backlashes of the experiment' and 'operational problems' are directly related to PA and the realized pilot project.

Recommendations

Based on the results of the research, it is recommended for Rijkswaterstaat to clarify the true significance of the barriers and its policy towards project alliances. Furthermore it is advised to standardize the concept of project alliancing in the organization in order to avoid the lengthy

procedures currently required to acquire the mandates for it. Otherwise despite the potential benefits, and due to the tight schedule of the projects, executing a project alliance will be neglected.

Due to the relatively large number of barriers, it cannot be expected for all of them to be handled simultaneously. Therefore the author suggests eliminating the root barriers as the first step; this will provide the appropriate setting for the removal of the other barriers and mitigates their effects. For this purpose the following three step plan is suggested:

1. Investigation of the true external influence on the choice of contractual models by Rijkswaterstaat is the first step, as it is somewhat disputed in the organization. If such influences are real and defining, convincing the politicians of the benefits of PA would be the priority for its adoption. However if the influences are misconceptions, it should be clarified and effectively communicated through the organization.

2. Focus on the policy of PA in Rijkswaterstaat; without the appropriate policy, any endeavor for the application of PA will be faced with complicated authorization procedures. It should be determined if Rijkswaterstaat is indeed planning to develop such policy, and if so, it should be placed on the future business plan of the organization.

3. Overcome the problem of shortage of personnel by including other public stakeholders in the alliance. Since Rijkswaterstaat is usually representing those parties, including them directly in the alliance will not only bring in their knowledge and shorten the communication lines, it will also aid with the misrepresentation of the public parties. For this purpose, conviction of such stakeholders is necessary. Therefore it is recommended for Rijkswaterstaat to devote the appropriate resources for promoting the concept of PA for their client organizations and partners.

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Abbreviations

ABT: Alliance Board Team
ALCT: Alliance Leadership Champion Team
AMT: Alliance Management Team
D&C: Design and Construct
DBFM: Design, Build, Finance and Maintain
FTE: Full-Time Equivalent
IPD: Integrated Project Delivery
LIP: Large Infrastructure Projects
PA: Project Alliancing
PNH: Province of North-Holland (Noord-Holland) - located in the northwest of the country and is responsible for the provincial infrastructure.
PP: Project Partnering
PPC: Public Private Comparator
PPP: Public-Private Partnership
PSC: Public Sector Comparator
PTM: Primary Team Members
RC: Relationship Contracting
RWS: Rijkswaterstaat - executive agency of Dutch ministry of infrastructure and environment of the Netherlands

1. Introduction

Construction industry has always been facing difficulties with managing the resources (efficiency) and achieving the projected performance (quality). Such difficulties are considered to be due to the characteristics of project outcomes and processes in construction industry; such as immobility, complexity, durability, costliness, high degree of social responsibility (Nam and Tatum 1988), fragmentation (Lehtinen 2013, Ghassemi et al 2011), competitiveness, high risk, time constraints and etc.. Not only this has caused the construction industry to be seen as quite inefficient with regard to quantifiable criteria such as time and cost, but the quality is usually also affected as a result, especially in the case of infrastructure projects.

As investigated by Flyvbjerg, Holm et al. (2003) in a research on 258 projects in 20 nations, 9 out of 10 transport projects overrun their budget. Furthermore the majority of these projects complete later than planned and deliver less than expected (performance-wise). Another research by Cantarelli and Wee (2012) covering 78 Dutch transportation infrastructure projects reveals that the road, railway and bridge/tunnel projects have respectively 62%, 50% and 47% cost overruns on average. And this tendency of cost overruns within projects has not been improved within the last 20 years. But these are mere statistics on a large scale and realistically no snowflake in an avalanche ever feels responsible. But what everyone can relate to is their own experiences, relations, conducts and more importantly, attitude. Thus what is more important is the cause of such inefficiencies and inferiority, and how individuals perceive the current situation. Still, to keep the convention of a formal research, some more 'large scale' information about the current situation in construction industry will be provided below. But to make it useful, it is advised to compare your own experiences, relations, conducts and attitude with it and try to be a fair independent judge!

Ingram and Bennet (1997), Spang (2009) and Girmscheid (2005) characterize the typical situation in construction industry as:

- Dissatisfied clients and distrust between client and contractors
- Decrease of know-how due to "lowest price-principle"
- Increasing expenses for claim and anti-claim management
- A growing number of disputes and litigations between clients and their contractors
- Low rate of return and high risk of business failure for contractors.
- Non-cooperative relationship between the client and the contractor (Spang 2011) despite an ever more increasing need for cooperation due to interdependencies, high complexity and uncertainty in the projects. (Anvuur and Kumaraswamy 2007)

Being generally considered project-based is another characteristic of construction industry (Lung and Lung 2007). The perception of relationships lasting only for a single project causes adversarial and opportunistic behavior, as a consequence short term gains and productivity will be favored over long term business, sustainability and quality considerations (Thompson, Cox et al. 1998; Dubois and Gadde 2002).

These troubling characteristics magnify in large infrastructure projects (LIPs) and bring about even more challenges by increased scope, complexity and uncertainty. In the past two decades, public-private partnerships (PPPs) have been used as one of the most effective tools for realization of infrastructure projects. Several partnership models have emerged to tackle the challenges but most of them have focused on decreasing the involvement of the client in the projects by assigning more of its tasks to the private party. In the other words, the solution to increase the efficiency of construction projects was seen in minimizing the interaction between the parties and managing the

interface with a strictly contract-based attitude, causing discouragement of cooperative mentality and encouragement towards a transactional relationship. Nevertheless these partnership models have their advantages in low ambiguity projects by decreasing the interfaces and interdependencies. But the aforementioned negative characteristics of construction industry would escalate in complex projects which in turn would cause adversarial behavior between the key parties involved and among project teams (complex in sense of high risk and uncertainty, large scope, stakeholder involvedness, innovative and challenging nature). This adversarial behavior and distrust have been identified as a major factor responsible for poor performance of construction industry (Zuo and Zillante 2006; Pinto, Slevin et al. 2009; Cheung, Wong et al. 2011).

Modern contracting, namely relationship contract forms, are aiming to diminish the negative consequences of conventional ones, especially in the projects in which these consequences are expected based on the past experiences. However there are two issues that need to be addressed; firstly no contract form is flawless and suitable for every project, and secondly that introducing and maturing a new contract form will not be an easy task due to the long era of using the conventional contracts. It should be noted that throughout this thesis, the phrase “conventional partnership models” (or conventional contracts) is differentiated from “traditional partnership models” (or traditional contracts). The former refers to all the currently common partnership models (including but not limited to DBFM and D&C contracts) and the latter refers to the more segmented forms of collaboration such as separate tender of design and execution of work.

Due to the unique characteristics of each project, there is no fit-to-all contract form. But rather the contract form of each project should be chosen depending on the many factors in the project such as: complexity, duration, capable execution parties, finance of the project, requirements of the project, uncertainties and risks of the project, stakeholders, regulations overseeing the client (procuring party), capabilities of the client, innovation requirements and etc. Thus familiarizing a new contract form to an already existing market does not mean it will be replacing the old ones completely. Furthermore, it is likely for a new contractual model to be resisted against in the beginning. The negative facet of this resistance is mainly due to the changes that it brings, and worldwide construction is not known as a flexible industry towards change. But the positive facet is due to unproven benefits and the balance of advantages and disadvantages. This positive resistance can acts as a sort of assessment for that contract type, if it can prove to be advantageous and adding more value to the works than previous practices, then the resistance will be reduced, as it was also the case with D&C and DBFM contracts. However no matter what the theoretical researches suggest as advantage, it cannot be proven until it is confirmed through actual experiences. The proof of the pudding is in the eating!

Despite many literature and researches available on the benefits of relationship contracting and namely project alliances, little to no attention has been given to its adoption in large organizations. In the Netherlands, it has been observed that adopting project alliancing has been a challenge for a at least two public organizations. This is in spite of successful experiments with the concept. Therefore this research is focused on the transition of experimenting with to adopting of project alliancing. The objective is to provide an overview of the organizational barriers for this purpose in Rijkswaterstaat, the case study organization of this research. Rijkswaterstaat is one of the main public infrastructure clients of the Netherlands and part of the ministry of infrastructure and environment. For this purpose, the following research question has been design and will be answered by means of this report:

“What are the (most critical) organizational barriers for progression of project alliancing from an experimental tool to an effective project delivery system for Rijkswaterstaat as a public entity?”

It cannot be emphasized enough that the purpose of this research is not to promote project alliancing, regardless of the circumstances and as a goal it-self. Rather the purpose is to give it a fair chance for further development and investigating whether projects can benefit from it or not by having a consideration for it during the process of choosing the right contractual model.

There are 8 chapters in this report. This chapter was the introduction of the research. Chapter 2 concerns the research design and includes the problem definition, research objective, boundaries, questions and explains the methodology of the research. Chapter 3 concerns the first (of two) literature review of the report. This chapter reviews the different relationship contracting forms and the current progress of project alliancing in the Netherlands. Chapter 4 includes the second literature review of the report and concerns the potential (theoretical) barriers of adopting project alliancing in the organizations. The result of this chapter has been used to prepare the interview protocol used in the empirical research. Chapter 5, which is the empirical research of the report, consists of the results of 3 sets of interviews; interview with internal project personnel (Rijkswaterstaat), interview with external project personnel (ProRail and Province of North-Holland) and a validation interview with the directors of Rijkswaterstaat who are considered to be decisive for the adoption of PA in their organization. In chapter 6 the conclusion of the research is drawn. Chapter 7 includes the author's reflection and finally in chapter 8 recommendations will be presented.

Research Design

- Problem Definition
- Research Objective
- Research Boundaries
- Research Question
- Applicability of the Research
- Research Limitations
- Research Methodology

2. Research Design

This chapter describes how the research was organized and carried out by means of defining the problem, the objective of the research, the boundaries, the research questions, the applicability of the results and the methodology used for the theoretical and the empirical part of the research.

2.1 Problem Definition

The need for a change of attitude in construction industry is comprehensible and widely accepted (Latham 1994; Egan 2005; Sakal 2005; Zuo and Zillante 2006; Chinyi 2007). This has motivated the active players in construction industry of different countries to experiment with different tools towards this objective. What concerns the public works in this regard is that it should not only be feasible to practice for the public entity itself, it should also be according to the national/international procurement directives that govern the country's procurement laws. Furthermore it should also be able to achieve enough acceptances from the private parties in the intended construction market for it to be practiced frequently and effectively.

Due to the characteristics of PA, it seems to be an appropriate instrument towards the needed shift of attitude (transactional to relationship) and culture (adversarial to cooperative). It pushes the current boundaries of contracting in construction industry just enough to be feasible and beneficial. Furthermore due to the increasing complexity of the projects, it is becoming more and more difficult to anticipate and handle the uncertainties involved. Therefore the solution is seen in flexibility of partnerships rather than rigidity towards uncertainties.

In the Netherlands the application of PA for infrastructure projects is relatively new and only a limited number of projects have been realized via this partnership model (which most of them were tendered as D&C contracts with the possibility of alliancing). Regardless of these limited experiences, reassuring results have been achieved by three of the largest infrastructure project clients in the Netherlands, Rijkswaterstaat[1], ProRail[2] and province of North-Holland[3], which encourages the use of alliance contracting for future projects.

By implementing a pilot project for PA, it seems Rijkswaterstaat (RWS) had enough motives for choosing PA to realize its projects. Since A2Hooggelegen is being referred to as a pilot project in related publications (Doorn, Blok et al. 2008; Bloemendaal and Geest 2011), it is implied that there will be more alliance projects in the future, provided that the pilot project proves to be successful. However despite the fact that A2Hooggelegen is considered a successful project, from the evaluation report and the book covering the experiences of this project, no other alliance projects have been planned or implemented within the past three years after A2Hooggelegen's completion. In the meantime, three years have passed and little to no progress has been made on the development and adoption of PA in Rijkswaterstaat. This is despite the fact that by every passing year, the knowledge and experience gathered from the pilot project, fades away a little more. In other words, the organization has invested in the knowledge of its employees by experimenting with a new project delivery system but it seems that recouping this investment was limited only to the pilot project

[1] Rijkswaterstaat is the executive agency of Dutch ministry of infrastructure and environment of the Netherlands

[2] ProRail is the government agency responsible for the railway network infrastructure of the Netherlands

[3] The Province of North-Holland (Noord-Holland) is responsible for the regional infrastructure of the province.

itself. Rushing into a new project is definitely not any better but it seems that even the theoretical development of PA or planning for its possible usage in the future is also receiving very little attention. Apparently the vision which initially motivated experimentation with PA has vanished. This is also the case for ProRail with its director general aiming for half of their projects to be delivered via PA and instances of talking about this ambition, with only 3 project alliances in total up to now. These are all in spite of general enthusiasm towards promoting team working, cooperation and collaboration in Dutch construction industry. Thus it should be asked what has caused the halt of PA in Rijkswaterstaat and more broadly within public organizations in the Netherlands?

2.2 Research Objective

The goal of this research is to provide accurate insights about the obstacles of implementing more project alliances by Rijkswaterstaat in a systematic manner. Therefore it is aimed for multifaceted results that provide actionable outcomes with a consideration for the structure of the subject organization, such as the hierarchical levels and the normal practices assumed in it, such as the PDM selection procedure.

As mentioned before, the purpose is not to promote PA, but to ensure that potential benefits are not neglected due to obstacles along the way. Some of the advantageous of PA as mentioned in the literature, theoretical, and also applied from case studies, are pointed out in this research and will be explained for clarification but they will be taken as granted. Provided the aforementioned objective for this research, it can be mistaken that the author is considering PA as a goal in itself and not a tool for achieving the actual goals. However it is hoped that with this explanation, such misunderstandings will be avoided. Furthermore focusing only on the barriers does not imply that there are no drivers for adoption of project alliancing in the public organization, or the barriers are more significant than the drivers, rather due to the limited scope of the thesis, it was decided to focus on only one of these two. Additionally since drivers of project alliancing have been more extensively studied in the international literature, but less attention was given to the barriers, the decision was made to focus on the barriers. Yet it is emphasized that this does not suggest anything about the ratio and significance of drivers versus the barriers.

2.3 Research Boundaries

The boundaries of this research is defined in the following two sections; the migration (overview) and the barriers' categorization (details). In the former section a bird's eye view is given on the focus of the research by means of defining a migration route for the adoption of project alliancing in an organization. And in the latter section, the different categories of barriers ahead of this migration are mentioned and the focus is directed towards on one of these categories; the internal (organizational) barriers.

2.3.1 The migration (overview)

In a larger picture, it is acknowledged that a shift from conventional contractual models towards a dynamic partnership is needed due to the increasingly dynamic nature of the projects (this will be explained in chapter 3 of the thesis). However this transition would not be easy for relatively conservative construction industry. Departure from traditional culture of doing business to a flexible one cannot happen overnight and requires a process pulled by necessity to 'change' and founded on feasible steps. Project alliancing fits in this larger picture in a key transition phase, a large yet feasible step forward that embraces this mentality. Thus the development of PA in construction industry would not only help overcome the current shortcomings of partnerships in this industry, it would also be a turning point for a revolutionary attitude towards the public-private partnerships in a long-term.

Nevertheless, the initial challenge for this purpose for Rijkswaterstaat and similar public organizations is the progression of PA itself, from merely an experimental tool to a well-developed and effective project delivery system and adopting it in their practice. Certainly measures need to be taken for facilitating this progression optimally. The challenge ahead for PA in the Netherlands is not only improving it as a project delivery system, but it is also finding acceptance and approval for its more frequent use.

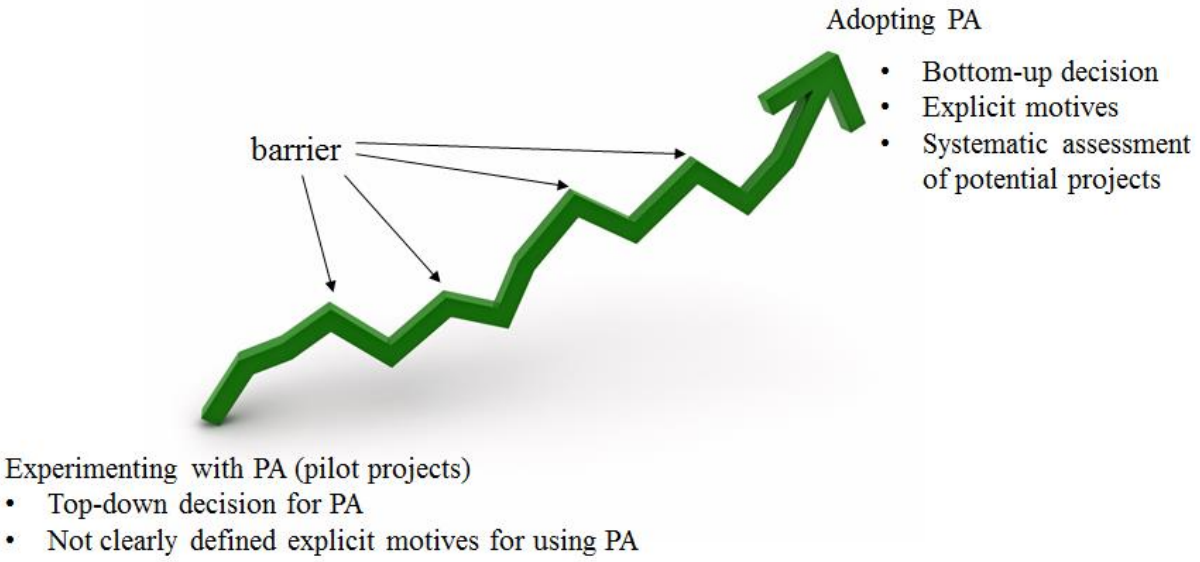


Figure 1 - Migration route for PA from experimenting to adopting

This research is focused on the aforementioned migration from experimenting with, to adopting project alliancing in Rijkswaterstaat and will seek the barriers for this purpose. But to define the state of experimenting and adopting, an identification method is required. The author suggests the identification method below for investigating whether an organization is experimenting with an idea or process, or has already adopted it as a normal procedure. This is based on the fact that currently project teams and project related personnel (such as the tender board) decide upon the contract type and details of partnership (by use of adopted tools/evaluation processes) in the case study organization and then they will run their suggestions to the higher managers and directors for approval, thus a bottom-up approach.

For project alliancing to be successfully adopted in an organization, the three following requirements are assumed necessary by the author:

1- The decision to use project alliancing should be a bottom-up decision rather than top-down order.
2- The decision to use project alliancing should be based on explicit motives.
3- There should be a systematic assessment of the projects for realizing via PA, based on the project characteristics.

In other words, the project teams and personnel should use a systematic procedure in order to assess whether a specific project can benefit from PA, have clear motives for using project alliancing as a project delivery model and decide upon doing so themselves, rather than being pressured by the higher management. This means a degree of 'standardization' should be done to the process of implementing PA.

According to this distinction, no public organization has yet reached the adoption state of project alliancing in the Netherlands (not even in the Europe, to the knowledge of author).

The main focus of this research will be objectively looking for the barriers of adopting PA in public organizations as a project delivery option; the persuasion and decision to choose PA in the first place is out of the scope of this research. In other words, this report comes in the picture if/when an organization decides that project alliancing will be a beneficial tool for their activities to achieve their intended goals.

2.3.2 The barriers' categorization (Details)

By initial investigation, the potential sets of barriers towards more frequent use of project alliancing by Rijkswaterstaat (and comparable public organizations) were identified and are shown in figure 2. As it can be seen, the barriers are set into two main groups of internal and external. External barriers are further divided into the following:

- PA system, the shortcomings of project alliancing as a project delivery system itself.
- EU/National regulations, the barriers stemming from directives governing the procurement and contracting of the public works.
- Political, the barriers due to political influences. Such as the tendency of 'Tweede Kamer' (Netherland's House of Representatives) towards the use of DBFM contracts.
- Market, the barriers to frequent use of PA from the market side (private parties).

The internal barriers only include the organizational barriers, as by definition organization barriers refer to all the (internal) barriers that stem from the organization's structure, services, resources, strategies, culture and anything else that are in direct relation to the organization itself.

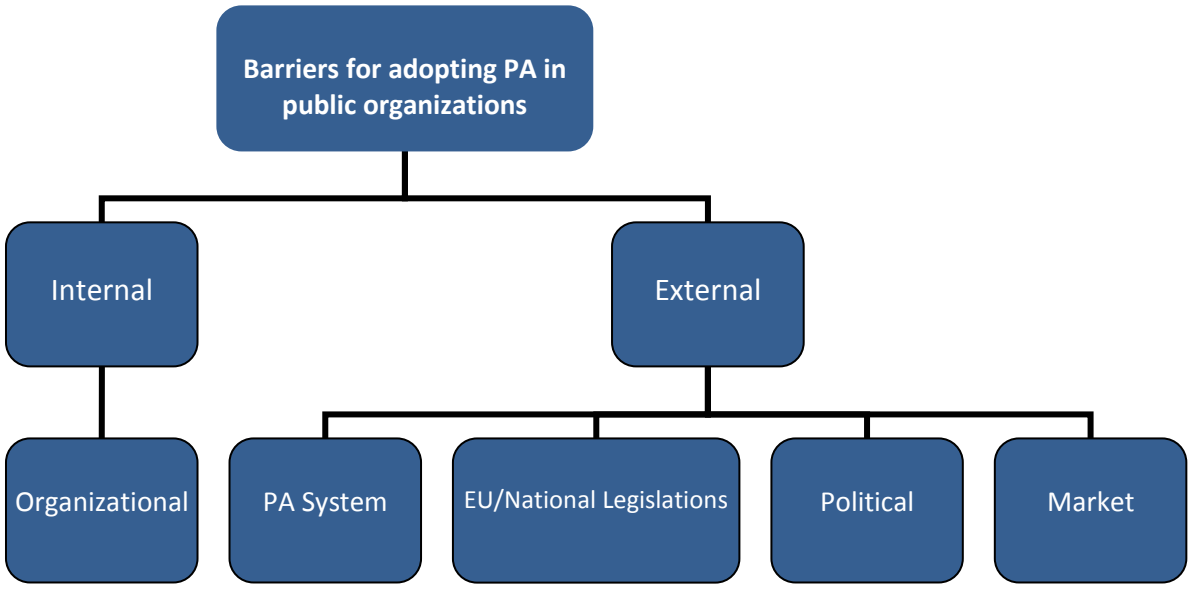


Figure 2 - The different categories of barriers ahead of frequent use of PA

Any critical barriers in any of the categories shown in figure 2 would impose difficulty to the intended progression of PA. However a logical priority order should be identified for concentrating the attention needed for solving these barriers. The author believes the most favorable order is the following:

Figure 3 - Most favorable priority order for removing the barriers

However it should be noted that:

- The shortcomings of PA system and its limitations have been covered thoroughly in the literature available about this topic and are therefore well known, these limitations will be mentioned briefly in this paper as well (appendix 5).

- The EU/National legislations do impose some restrictions to the 'pure form of project alliancing' (such as no price component included in the selection criteria for the selection of the contractor); however by the increasing number of alliance public projects in the EU, more and more insight about handling these restrictions is becoming available. And presently acceptable approaches for project alliancing within EU and national directives are known. (appendix 4 explains what is meant by pure form of PA)

- Despite the fact that political influences on procurement methods practiced by public entities affect the choice of appropriate method significantly, it is not in the direct control of Rijkswaterstaat to abruptly lessen these influences. However there are measures that can be taken to gradually alter these influences to some extent, such as giving more attention to R&D and promotion of new procurement methods by increasing the knowledge about their benefits. Furthermore by removing all the other barriers ahead of PA, such as organizational and market, it would be easier for politics to accept the intended changes once they see wide-spread support for it.

- Furthermore the reason that market barriers are mentioned after organizational barriers is that private parties will not invest enough resources in developing a new contracting model if they do not see enough effort from the client (owner) for using it (thus no guarantee that this investment will be beneficial in the near future). As a result, by initiation of the public organizations, it would be more encouraging for the private parties to also invest in this new contractual model.

Thus in practice the suggested priority order for removing the barriers of frequent use of PA by public organizations will look like this:

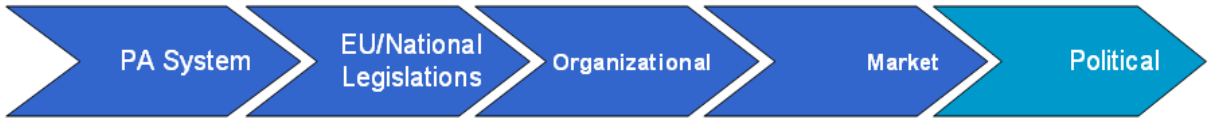


Figure 4 - Suggested priority order for removing the barriers in practice

Therefore the author believes that the present priority for the progression of PA in public organizations such as Rijkswaterstaat is focusing on the organizational barriers. This line of reasoning has also been discussed and approved during initial meetings with some of the experts within Rijkswaterstaat who are concerned with the topic.

2.4 Research Questions

With regard to the research objective and boundaries, the following main question has been defined for this research:

"What are the (most critical) organizational barriers for progression of project alliancing from an experimental tool to an effective project delivery system for Rijkswaterstaat as a public entity?"

This research question has three sub-questions embedded in it:

- What is project alliancing?
- What has already been done in the Netherlands with regard to PA?
- What are the potential (theoretical) organizational barriers for adopting PA?

These sub questions will be answered through literature review in the upcoming chapters (chapters 3 and 4).

2.5 Applicability of the Research

Even though the focus of the research is Rijkswaterstaat, the results will hopefully provide some insights for other public organizations that are struggling with a similar problem as well. In addition, ProRail and North Holland Province were also included in the research, thus the results are not solely based on a single project by a single organization, but rather on all three Dutch public organizations with experiences with PA. Project alliancing is not being widely used in any country other than Australia and New Zealand. But the high tendency for achieving the promising advantages of it can be seen in many countries. Therefore it would not be a surprise if in the near future more countries decide to experiment with such, or similar contracts. The researchers and developers of PA in such countries can also use the results of this research to learn from the experiences of the Netherlands.
Additionally, during the course of this research, it was observed that some of the barriers are not only limited to adopting project alliancing, but also apply to adopting any innovative process within organizations.

2.6 Research Limitations

Due to the very limited experiences of PA in the Netherlands, there is limited knowledge about this contract form available. As a result, the limited number of eligible interviewees is recognized as a limitation of research.

2.7 Research Methodology

As already stated, the purpose of this research is to find the organizational barriers for the application of project alliancing in public organizations. Figure 5 (page 26) visualizes the overall research design of this report and the steps that need to be taken to achieve the research objective. As it can be seen in figure 5, the research includes a theoretical and an empirical research. The theoretical research is comprised of two different literature studies; the first one on the topics related specifically to different aspects of project alliancing and will provide the answer to the first two sub-questions of the research. And the second literature study addresses the theoretical organizational barriers that could affect adopting project alliancing which will answer the last sub question and be used as a basis for the interview protocol in the empirical research. The empirical research focuses solely on answering the main research question of the report.

2.7.1 Methodology for the literature studies

The first literature study covers the different aspects of PA. In this phase it is tried to gather as much related information as possible about project alliancing, the vision it encourages, the advantages, the shortcomings, its feature, boundaries and etc. For this purpose, keywords such as relationship contracting, project alliancing, alliancing and partnering were used to find the appropriate literature mainly from the google's scholar section (scholar.google.com). In the first instances, the most cited literatures were reviewed. When necessary, the references in these literatures were also reviewed for further enlightenment and confirmation of the references. Then a draft from the gathered data was drawn and the potential areas with missing information were identified. In the second instances, focus was on finding appropriate literature for those missing information, to ensure that the report has a complete storyline. For example, whenever the different components and processes within project alliancing were not explained enough, those components were searched separately; such as the partner selection and competitive dialogue as the main awarding procedure used for PA. Another approach adopted, was finding literature according to the published year, in order to gain any potential insight in the progress of knowledge in the field of relationship contracting.

To avoid a bias view and a tunnel vision, an extended separate search was conducted to gather critical views about project alliancing.[4] However very limited literature was found and almost none of which was written in the past 10 years.

Finally a search was conducted on the library and repository site of the three main technical universities of the Netherlands; technical university of Twente, technical university of Eindhoven and technical university of Delft. The purpose of this search was to find project alliancing literatures which were based on the Dutch infrastructure and market; thus providing a better view of current status of PA in the Netherlands.

The second literature review covers the potential (theoretical) organizational barriers inhibiting PA from being practiced. The purpose of this literature review was to provide a basis for the data gathering and analysis of the empirical research.

By searching different combinations of organizational, internal barriers and project alliancing, obstacles and etc. it was observed that no literature is already covering the topic of this research. Thus the potential barriers were found on the basis of the lack of requirements for successful development and utilization of PA. For this purpose, project alliancing was defined from the scientific perspective as a process innovation that might require some changes within the organization. This provided the opportunity to investigate the potential barriers of process innovation and organizational change that can also be applied to utilization of PA. Another two categories were later on added to ensure a multi-facet approach that covers the most important potential barriers; these two are barriers of utilization of research and frequent use of PA. It should be noted that these four categories have overlaps with each other but the main purpose of creating them was to have a benchmark for the literature review. Subsequently, the keywords for each of these categories were searched for finding the appropriate literature. These keywords include, but are not limited to: barriers to innovation, process innovation implementation, innovation management, applying innovation, change management, barriers to organizational change, organizational barriers to innovation, research utilization, barriers to applied to research, barriers to project alliancing and etc.

[4] This search was mainly based on the following keywords: disadvantages of project alliancing, shortcomings of project alliancing, shortcomings of relationship contracting, limitations of partnering and etc.

2.7.2 Methodology for the empirical research

This research is focused on the identification of (organizational) barriers, thus it is an exploratory-qualitative research. As Stevens, Loudon et al. (2006) point out, for exploratory researches, it is important that the researcher digs beneath the surface of what can be seen. To do so, flexibility in data gathering is very important, especially if the subject of the research is as complex as an organization. One of the most recommended methods for data gathering of such researches is personal interviews (Rubin and Rubin 2005; Flick 2006; Marshall and Rossman 2006). Qualitative interviews help find the answer to questions that cannot be answered simply or briefly by providing the opportunity to discuss and receive proper explanation (Rubin and Rubin 2005). Such approach helps cover both a factual and a meaningful level (Kvale 1996).

Additionally by considering the definition of an organization from Oxford dictionary, "An organized group of people with a particular purpose, such as a business or government department", it can be concluded that the people are the main elements of an organization, thus their perception of barriers is of significant importance for this research.

Having flexibility during the interviews and going off at tangents, which is encouraged for a qualitative exploratory research, would also give more insight into what the interviewee sees as relevant and important (Bryman 2004). In other words, simply learning about the topic is not enough, it is also important to learn what is important to those being studied (Rubin and Rubin 2005). Therefore the choice is made for semi-structured interviews, based on an interview protocol (already prepared discussion points) and yet providing flexibility to explore any upcoming opinions and ask follow up questions.

Another reason for choosing semi-structured interviews is that the different aspects of project alliancing is not well-known and clearly defined, thus this could affect the outcome of the interviews. However by ensuring that the participants have a clear understanding of the intended topic, the quality of the collected data will be improved.

Before each interview it was asked for the permission to record the interview, which all the participants but one agreed to it. This was done to ensure all the exchanged relevant information is considered in drawing conclusion at the later stage, however the confidentiality of the interviewees will be ensured upon publishing the data to comfort and encourage the interviewees for opening-up during the interviews. This is due to the fact that in order to identify the organizational barriers, the organization should be looked through critical lenses, which could make it a sensitive topic. But it is still understood that in some cases, due to the low number of eligible interviewees, the data gathered are traceable. This was also explained to the interviewees beforehand.

A good recommendation from Rubin and Rubin (2005) for such interviews is the rough following of the steps below during an interview session that was considered during the data gathering of this research:

- Introduction of the interviewer, the topic and the interviewee
- Asking the easy questions, showing empathy
- Asking the tough questions
- Toning down the emotional level and encouraging good feeling of the interviewees for their assistance and participation in the research
- Closing while maintaining contact for possible future follow-up questions

As it is shown in the research design diagram (figure 5), there are two separate groups of interviewees; Rijkswaterstaat's interviewees who were involved in the A2Hooggelegen project (8

interviewees), and the other two public organizations' interviewees (ProRail and province of North-Holland) who are/were involved in a PA project (9 interviewees). In total 17 participants were interviewed from the project personnel of the aforementioned organizations. Separate but compatible interview guides were prepared for these two groups and the results were first analyzed separately, and then compared with each other.

The interview guide and the data analyzing method is based on the recommended guideline provided by (Rubin and Rubin 2005), as it is similar to most data analysis methods used in qualitative researches (Flick 2006; Marshall and Rossman 2006).

In the first instance, several potential barriers were extracted from the literatures. These potential barriers were coded and then translated to discussion points/interview questions for the interview protocol. For each interview, additional questions were prepared according to the expertise, field of activity and experiences of each interviewee, as this helps to match the questions to what the interviewees know or are willing to share. This way each discussion point in the interview guide is either relating to one or more coded potential barriers or is an open question for discovery of what the interviewee finds important and exploration of that. A standardized version of the interview protocol can be observed in appendix 6.

It is important for the interviews to follow a logical fashion as a normal conversation to ensure the interviewee is not confronted with an out of context question. Thus each interview, as an ordinary conversation is invented new each time it occurs (Rubin and Rubin 2005).

Important notes for the interviews are as follows:

- Trying to make the interviewees as comfortable as possible by taking measures such as: Choosing the language that the interviewee prefers for the interview (English/Dutch), conducting the interviews at the office location of the interviewees, a couple of minutes of small talks before the interviews and a little introduction of the interviewer and the research, ensuring the interviewees that the recorded interviews will not be publicly shared and etc.
- Non-suggestive questions in order to avoid influencing the interviewees' responses.
- Open ended questions and giving chance to the interviewees to introduce new topics of their own in the interview.
- Achieving non-direction by having all forms of questions: unstructured, semi-structured and structured. Thus specificity of the questions increased in the loop of the interviews. This technique not only ensured that the interviewee is given enough flexibility to steer the conversation towards what they find most important in the beginning of the interviews, but also provided the right background for the structured questions at the end of the interview.
- Flexibility in letting the interviewees to make their point in an issue that is brought up and then referring to sub-issues in it that is considered important later on. This will ensure the interviewee is not interrupted and his/her train of thoughts is not lost.
- Use of probes after responses of the interviewees, respecting the three second rule (a short period of not asking further questions between each response for the interviewee to have the opportunity to explain him-/her –self more.
- Showing explicit interest in what the interviewee states in order to promote their initiative in bringing up related issues.

A summary of the data gathered during the interviews was written, from the notes taken during the interviews and by listening to the recorded interviews. This summary should be a good representation of the whole interview, including all the points discussed and all the data that can possibly be used in the analysis phase. Each interview was analyzed separately as soon as possible to

find the barriers (data units), either the already coded barriers from the literature or the new barriers discovered during the interviews. This provided the opportunity to investigate the new barriers during the next interviews. After conducting and analyzing all the interviews, the data concerning each of the codes were separated and put in a single file. Thus at this stage, all the data linked to a specific barrier was in a single file, ensuring a complete overview of that coded barrier and making a complete analysis of that barrier possible. Discovering and forming concepts, themes and interpretation of the data was done in this stage. It should be noted that in the process of analysis, some of the coded barriers were combined or clustered together since they had a strong link, this way a coherent narrative was made possible and a more comprehensive concept/theme was formed.

In the meantime it should be noted as Schatzman and Strauss (1973) have pointed out in their classical work, qualitative data are exceedingly complex and vary in level of abstraction, in frequency of occurrence and in relevance to central questions in the research. Also they vary in the source or ground from which they are experienced. Keeping this in mind and the diagnosis nature of the research, if an issue is brought up by an interviewee which in the first instances might seem irrelevant, more digging into it was done to observe their perception of relevance to the topic.

For the analysis, since the gathered data, even after organizing were voluminous, a heightened awareness of the data, a focused attention to those data and openness to the subtle undercurrent is required. Each theme or concept that is identified within the data was marked and recurring ideas or languages and patterns were simultaneously investigated. Such patterns helped develop a broader concept that might have become difficult to achieve due to limited resources for the data gathering. Finally by linking the findings together and making sense of the concepts by explaining the underlying notions with a complete overview, a conclusion is drawn.

The same was done for the second set of interviews. And after the separate analysis, a cross-analysis was conducted to compare the results and extend the information regarding each barrier.

This concluded the preliminary results of the research. The conclusion is a set of barriers, with detailed information about each that is inhibiting the use of PA. As the final step of the research, a validation round was conducted with the decisive functions within the organization for the future use and development of PA. In this validation round, the results were presented to the 10 identified eligible interviewees to investigate whether the barriers are recognizable to them or not. Additionally, the perception of the directors (and the decisive functions) concerning the barriers was also investigated by asking for their remarks about each barrier (appendix 10).

At the end, the conclusion of the report was drawn based on the interviews of project personnel and directors.

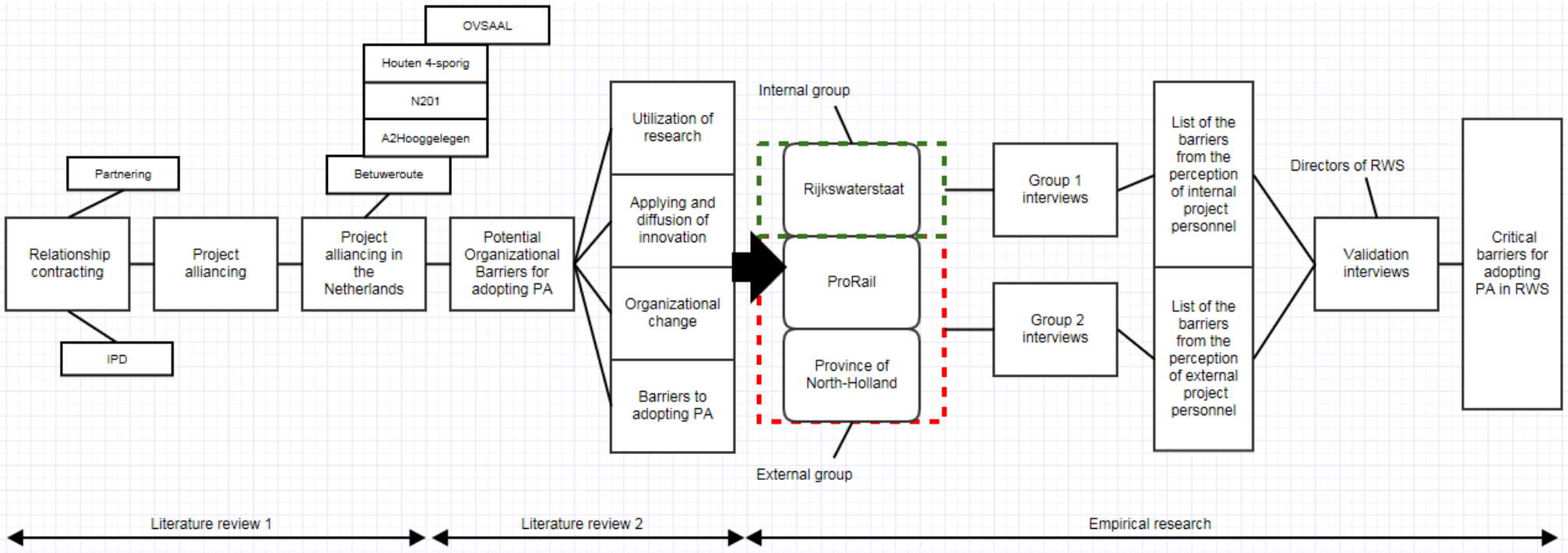


Figure 5 - The research design

Theoretical Background

- Relationship contracting and project alliancing
- Project alliancing in the Netherlands
- Potential (theoretical) organizational barriers for adopting PA

3. Literature Study (1): Relationship contracting, Project alliancing and the Dutch experiences

In this chapter, the first two sub-questions will be answered. For this purpose, relationship contracting is briefly defined and the different wide-known forms of it will be explained. Since the two sub-questions are only meant to provide the required background for the empirical research and are not the main focus of the research, a separate literature study has been conducted for them, thus the title literature study (1).

3.1 Relationship contracting - Dynamic projects, dynamic partnerships

This section briefly explains the different types of relationship contracting in order to document the similarities and differences they have with each other. Then by explaining project alliancing, as one of the three widely known relationship contracting forms, the author has tried to avoid any confusions with regard to the 'concept to be adopted' that the empirical research is focused on. However since defining and explaining project alliancing is not the main focus of the research, some of the information in this regard is placed in the appendixes (3 to 5) and can be referred to for further information. The information provided in this section will answer the first sub-question of the research.

As projects get more complex and with higher risks, the need of a partnership model which optimizes the management of risks, diminishes the adversarial behavior (explained in appendix 1) as effectively as possible, promotes the development of soft skills and encourages innovation gets more crucial. Dynamic environment and society demand dynamic projects, *"with 'change' being an inevitable part of it"* (Sakal 2005). Relationship contracting has been developed to answer this increasing demand. *"Unfortunately most contracts do not embrace change, but instead treat it as an anomaly by trying to specify every possible contingency and assign liability in the event change occurs"*, thus *"acting as legal shields instead of focusing on maximizing project outcomes"* (Sakal 2005).

The relationship contracting has been developed to acknowledge the dynamic nature of projects and mitigate the shortcomings of more conventional contractual models by giving more attention to the relationships between the involved parties rather than just on the project-specific requirements and enforceable contractual clauses. In other words, the relationship domain (how the job is to be done) is just as important as the task domain (the job) (Quick 2002).

There are currently three widely-known forms of relationship contracting; project partnering (section 3.1.1), integrated project delivery (section 3.1.2) and project alliancing (section 3.1.3). The first two forms will be briefly explained but more attention will be given to the third form, project alliancing, as it concerns the rest of the research.

3.1.1 Project Partnering

The terms project partnering (PP) and project alliancing (PA) are usually used interchangeably to describe a similar concept. They both aim for less conflict in a cooperative partnership between the principal and the agent, achieving shared goals, enhancing team spirit, improving communication and information flow, commitment and etc. However the distinction is on how they attempt to achieve these principles; project partnering relies on a moral agreement for this purpose but project alliancing, as it will be further explained later, puts more stress on the contractual arrangements.

In PP, the loss of a party should not be the win of the other. Scott (2001)'s definition of Partnering is: *"a relationship between two or more companies or organizations which is formed with the express of intent of improving performance in de delivery of projects."*

In general, partnering is aimed to enhance the levels of cooperation and collaboration between the parties by encouraging alignment and commitment to achieving common goals based on the interests of all the partnering parties.

In the literature, it is clearly agreed upon that partnering is focused on improving cooperation (via development of soft skills) but is based on traditional contractual models (Scott 2001; Walker and Hampson 2003; Ross 2004; Yeung, Chan et al. 2007); thus it is merely a collaborative procedure and not an actual construction procurement method (Lahdenperä 2009). This can also be seen from the literature review (appendix 3), where the different elements of partnering, project alliancing and integrated project delivery are brought together in one table.

3.1.2 Integrated Project Delivery

AIACC (2007) defines IPD as a project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to reduces waste and optimize efficiency through all phases of design, fabrication and construction. Matthews and Howell (2005) mention two main principles that govern the IPD, firstly all the primary team members (PTM) are responsible for all provisions of the prime contract with the client, and secondly PTM share the risk and profit for total project performance. It should be noted that the prime contract, the contract that binds the parties together, can have any form as long as it is compatible with the principles of IPD.

IPD can be considered either a philosophy or a project delivery system (NASFA 2010). In its second meaning, IPD is quite similar to PA. This is also observable from the literature review in appendix 3.

3.1.3 Project Alliancing

In this section project alliancing will be explained through the definitions provided in the literature. Afterwards a working definition, based on the literature, will be presented for project alliancing to be used in the case study organization as a mean of defining the concept and avoiding any potential confusion.

By studying project alliancing in details, it can be observed that there is no single definition for it in the literature. There is however a general definition that can be observed similar in many literatures: *"project alliancing is a project delivery method based on a joint contract between the key actors to a project whereby the parties assume joint responsibility for the design and construction of the project to be implemented through a joint organization, and where the actors share both positive and negative risks related to the project and observe the principles of information accessibility in pursuing close cooperation."* (Lahdenperä 2009)

Simply put, project alliancing can be seen as a joint-venture, but no legal entity is formed and the duration of the partnership is limited to the project's preparation and construction.

Scott (2001) distinguishes project alliancing as a variation of project partnering (project-specific partnering) with incentive scheme, whereby the rewards of the contractors and indeed the owner are linked directly to actual performance during execution phase of the project.

As it was pointed out before, project alliancing aims to achieve partnering objectives by stress on the contractual arrangements. However these contractual arrangements are not to shield the parties from each other, like conventional contracts, but they are arrangements that actually facilitates the realization of partnering objectives.

Hutchinson and Gallagher (2003) put forward a clear definition of a project alliance: “an integrated high performance team selected on a best person for the job basis; sharing all project risks with incentives to achieve game-breaking performance in pre-aligned project objectives; within a framework of no fault, no blame and no dispute; characterized by uncompromising commitments to trust, collaboration, innovation and mutual support; all in order to achieve outstanding results.”

(Ross 2003) defines project alliancing as: “… where an owner (or owners) and one or more service providers (designer, constructor, supplier, etc.) work as an integrated team to deliver a specific project under a contractual framework where their commercial interests are aligned with actual project outcomes.”

Koolwijk and Geraedts (2006) identify three main elements for PA: formation of an integrated project organization, working on the basis of mutual objectives and proportional sharing of risks, benefits and losses.

This being said, the exact domain, structure, incentive mechanism, soft skills required and etc. are more difficult to find in the literature, but this is not due to lack of research, rather it is due to the flexibility and dynamic nature of PA. This has an advantage and a disadvantage: the advantage is that project alliancing is considered to be tailor-made for each project separately, ensuring that it will offer the best for the project according to its unique specifications and characteristics, but the disadvantage is the confusion that comes with it, making it difficult to comprehend and thus apply. This confusion about PA not only has restricted its use, but has also been observed to cause project teams considering their project an alliance project, only due to having some partnering elements (soft elements) embedded in it. This phenomenon is considered a threat to PA and would cause organizations expecting the benefits of project alliancing, from a non-alliance project (Ross 2003). And when these expectations are not met, it will demotivate interested parties in using project alliancing. Thus the problem of having project alliancing expectations from a project that only has the label of PA but with a different structure can also be traced back to unclear definition of PA.

Another aspect associated with unclear definition and structure for project alliancing, is the development of variants. Despite these variants all being considered project alliancing (at least to some extend), there are differences between them that might have significant effects for the project; such as the domain of the alliance in the project.

To avoid confusion and set a benchmark, the “pure” and the “minimum” project alliancing form will be explained. The pure form is based on the Australian experiences, as is the minimum form. However it should be noted that by calling it the pure form, the author does not imply that this is the ultimate form of PA, but rather this is the ultimate form that is feasible within the current legislative regulations on public projects procurement in Australia and is considered by a number of scholars to deliver the most benefit from the other variants. However some adjustments might be needed in order to apply this form in different countries with regard to their construction industry regulations. As it is briefly explained in the appendix 4, with the right adjustments this form is feasible within the EU legislations. Yet, this can change, against or in favor of PA, in the future by new regulations being put in place or old ones being abandoned. Thus the term pure project alliance is used loosely to refer to a structure of project alliancing that is believed by many scholars to provide the most advantages while being yet legally feasible.

Furthermore with the help of literature, a minimum set of requirements will be defined for a project to be considered project alliancing. These minimum requirements can be seen as a filter in order to avoid projects being considered PA by incorporating only a few non- crucial/-decisive elements. Thus

both ends of the project alliancing spectrum (at least till now, since this range might be broaden in the future, due to the mentioned dynamicity of PA) will be defined. It is however emphasized that this endeavor is to have a common view on what project alliancing is (and what it is not), on a higher level in an organization to help lessen the confusion associated with it. Having a degree of flexibility in the definition of PA is very useful since it can be interpreted as required by the project and the circumstances. However, adopting it in an organization requires a common view on it on a higher level than the project teams. Therefore here it is tried to composite a "working definition" for PA that still leaves enough room for the interpretation of project teams but yet sets a boundary for what can be labelled as PA and what not. In doing so, the many definitions from the literature were considered together and pieces were glued together to form a complete working definition. There are some overlaps on the elements used in this definition but this has been done deliberately, to provide more information about such elements. Thus building on the first definition of PA that was brought in the beginning of this section and adding some of the important elements from the literature review of appendix 3 and 4, the following working definition is suggested to be used in the case study organization:

A **Project delivery method** based on a **joint contract** (legally binding), involving the **key public and private actors** respectively as **principal and agent, as early as possible in the process** for a **single project** whereby the parties assume **joint-responsibility** for the design and construction of the project to be implemented through an **integrated project team** and **joint organization** (not a legal entity), and where actors **share both positive and negative consequences** via a **pain/gain sharing mechanism** that **aligns their commercial interests** and **ties it to the end result of the project**, thus is founded on the basis of **best for project attitude** and aims to create a **win-win situation** through **optimized teamwork** and **proper platform for the development of soft skills**.

In an effort to provide a clear distinction between PA and similar "collaboration processes", this working definition is composed to set a benchmark for whether a project can be considered PA or not. However it should be noted that a lot of details from the literature review is intentionally not included in this working definition to avoid limiting its use.

Further Information: Elements of Project Alliancing and the Success Factors

Appendix 3 provides an overview of the elements and features associated with PA in the literature. It was observed that no clear distinction could be made between the critical success factors and the critical soft-features of PA, meaning what was referred to as a success factor in a number of articles, was referred to as a requirement in a number of other articles. To overcome this dilemma, the most cited literature were selected as the basis for deciding which elements are considered requirements and which are success factors. For this purpose, it was observed that in many cases, an element was mentioned as a success factor in the earlier articles (according to the published year) but in later articles that same element was considered a requirement. This can be related to the dynamic nature of PA; if there is critical success factor, such factor should be implemented in the model of PA for the future projects. This proves the evolution of PA model over the years. On the other hand, there were also cases that despite some elements were mentioned as a requirement in the earlier articles, it was again considered a success factor in the later articles. This can be explained either as a disagreement between the scholars, or as a lag in adopting such elements in the model of PA. Nonetheless it should again be mentioned that there is no clear distinction and agreement between such elements. Thus what is shown in appendix 3 can be seen as a conceptual distinction of the clusters of elements associated with PA which can be changed not only over-time but also with review of different literature.

It should be emphasized that the intention of bringing the different elements assigned to project alliancing in this section is not to try to define a solid definition for it (since this can be an impossible task!) but the intention is that by doing so, an approximate image of the different features of project alliancing will be created that helps with the design of the future project alliances.

An observation about the table of PA elements (appendix 3) is the distinction in the articles before and after the year 2006, as a noticeable drop in the identified elements can be observed, exactly opposed to what was expected from the reasoning provided in the above paragraph. However through closer review of the articles after 2006, it is understandable that the authors did not mention some of the elements explicitly but they are completely in line with the concept of PA that they refer to. This can also be due to the fact that a large number of most cited literatures regarding PA were published before 2006 and thus the associations of those elements with PA were already known between the scholars. This can mostly be seen in the clusters of "supporting elements" and "soft elements". On the other hand, for the cluster of "hard elements", a consistency can be seen throughout the years. The author believes this consistency is due two issues:

1- By properly implementing the hard elements, development of other factors would be possible, therefore there is emphasize on the hard elements.

2- The concept of partnering is far better known than PA between the practitioners. Therefore initially many practitioners confuse partnering with PA. Aware of this confusion, the scholars have emphasized on the hard elements throughout the years to show the distinction between the partnering and PA.

Despite further investigation in finding pattern from the literatures study, no noticeable trend is observed with regard to the development of PA throughout the years. What is clear is that many of the literature are based on the Australian experiences and thus it could be the case that the identified elements in these literatures are closely related to the characteristics of the aforementioned market and governing legislation.

3.2 PA in the Netherlands

This subchapter documents what has already been done in the field of project alliancing in the Dutch infrastructure sector, answering the third sub-question of the research. There are two sections in this subchapter; (3.2.1) the concept: project 'design' alliancing and (3.2.2) project alliancing experiences in the Dutch infrastructure sector. Section 3.2.1 describes the model of project alliancing used in the Netherlands and proposes the label of project 'design' alliancing for it. Section 3.2.2 refers to the Dutch experiences in this regard and provides a brief description of the projects realized via this model.

Before starting this chapter and the following empirical research, it is important to point out that this research is focused on finding the barriers for adoption of project alliancing as a PDM in public organizations, and to find the barriers, the current status was looked through critical lenses. That of course is critical yet realistic. Therefore it should not come in as a surprise if positive experiences and facts are not covered as extensively as negative ones. A great number of managers, personnel and researchers have contributed to reach the current state of development for PA in the Netherlands and making it a pioneer in the Europe for this contract type. Positive experiences and results have been achieved. And the author by being critical does not question their efforts and achievements,

but rather tries to provide constructive insights for further development of the model. To read more about these achievements, it is advised to refer to the books, evaluation reports and related documents that were published after each experiment, such as (Bloemendaal and Geest 2011) (ProRail 2005; Betuweroute 2007).

3.2.1 The Concept: project 'design' alliancing

Project alliancing in the Netherlands is relatively new and is considered to face many struggles for its further application such as lack of clarity with regard to the definition and content of PA, lack of enough practical experiences and lack of trust between the parties (Koolwijk and Geraedts 2006).

Since the start of first infrastructure project alliance, almost 15 years have passed. In total there have only been 5 infrastructure projects in the Netherlands labeled as project alliances (emphasize on labeled as one, this will be explained further ahead). However 3 of these projects were tendered as D&C contract with the possibility of project alliancing, which was applied after the tendering procedure. Yet all of these 5 projects are based on the same model of project alliancing that includes a conventional D&C contract and an overarching alliance contract as a partnership model that defines the gain/pain sharing, establishes relationships and explains the shared domain. In other words, all 5 PA's (even the ones tendered as PA), have a regular D&C contract with an extra option for forming a project alliance. For 3 projects, this option was discussed and implemented after the awarding of the contract but for the other two this option was seen as a default which could still be canceled through a fallback option to a regular D&C contract.

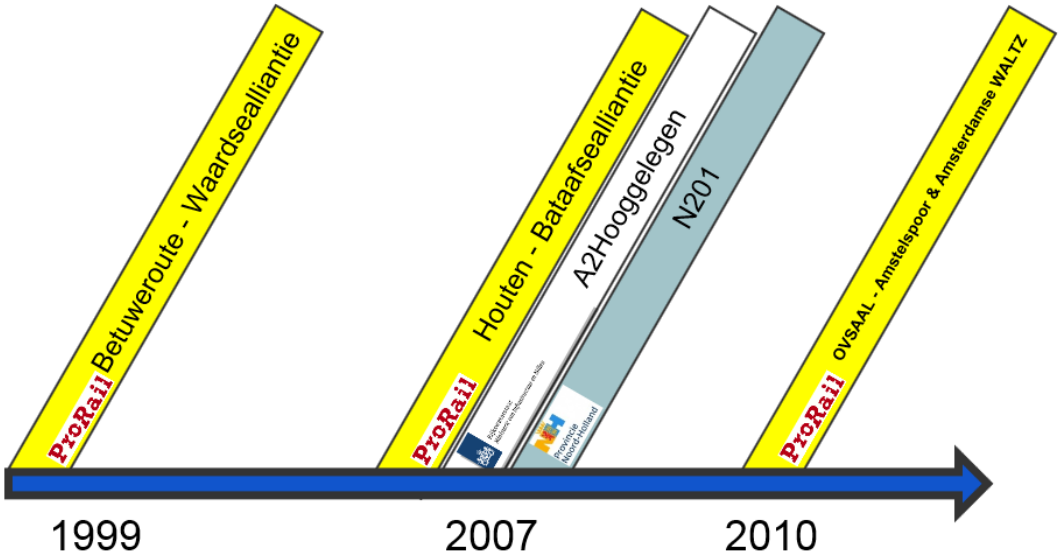


Figure 6 - The Dutch infrastructure sector project alliancing timeline

In this model, the design related risks are shared between the owner and the contractor, but each party also carries separate risks which they are perceived to manage better, such as the execution risk by the contractor and acts of god and acquiring the required permits by the owner. Thus, the practical domain of the alliance is limited to the design and design related matters. As a result, the author believes these alliances should all be considered "project design alliancing" instead of "project alliancing", since the latter refers to the project entirely. This being said, in the Dutch model, the alliance team is still formed 'as early as possible' (yet not before a reference design) and would be involved in the project till the final delivery by managing the execution team of the contractor. But

the alliance organization in this case will act as the client for the construction team, which is part of the winning consortium. The figure below will demonstrate how the domains of parties will be with and without PA. In principle, the goal is to transform one large problematic interface between the domain of activity of the parties, to two smaller and smoother interfaces, via creating a virtual middle-organization that is made of both parties.

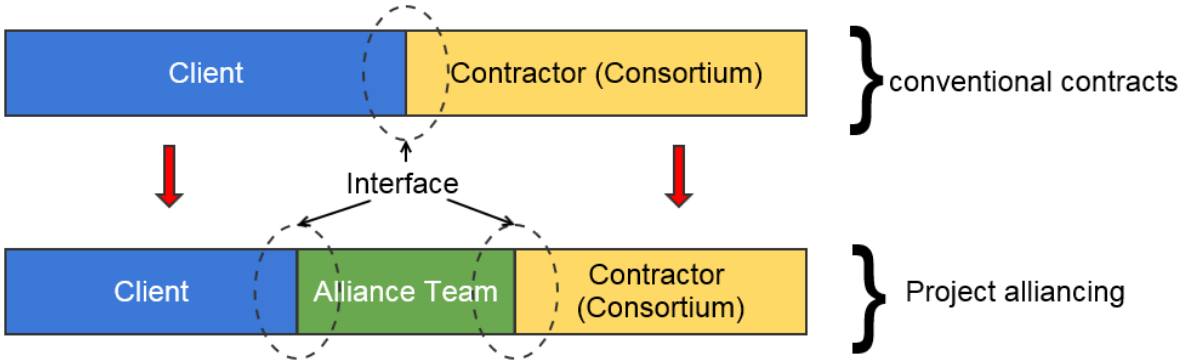


Figure 7 - The interfaces comparison between conventional contracts and project alliancing (source: interview with Henrico Plantinga, ProRail)

Another attention point with the current PA models in the Netherlands is that as mentioned, due to having a typical D&C with an overarching alliance contract, the construction cost is submitted by the bidders during the tender phase and is regarded as fixed price. Then by allocating some of the risks and tasks to the alliance, a portion of this cost will be determined to be put in the alliance fund. The client will also provide an additional equal amount to be put in the alliance fund. This way the mutual fund will be created. Furthermore the bidders submit a reference pricing sheet during the tender, which eventually the client will use as a reference point after that the contract was awarded for any additional/extra work.

Therefore in this model, despite having a degree of clarity about the costs of the project, open-book accounting as envisioned in the literature is not the case. Thus the 3-limb model suggested in most of the PA related literature is replaced with a more systematic and old-school mechanism. First the motives and benefits of using such mechanism will be explained, then the drawbacks.

According to EU regulations, having a price component in the tenders is required. Thus awarding the contract and developing a price with the contractor later on, is not acceptable (Nygård 2014) (However there are also cases that the projects were tendered with no price components in the European Union, as long as the tendering procedure is completely clear and predefined). Furthermore, such arrangement will ensure the client of a “ceiling price” before the contract is awarded and stimulate competition (hopefully to a healthy degree). On the other hand, this approach might be considered completely against the principles of alliance contracting, since this way, the client is still forcing the contractor to submit a sharp price, thus bringing the financial advantages to its own side, then after a contract, sharing the rest of the financial advantages.

Therefore the contractor needs to come up with two sets of optimizations; first optimizations to submit a lower price than the competitors thus winning the contract, then optimizations to lower the costs and share the benefits with the client. As a consequence, this mechanism can be seen to be in favor of the client. This is especially the case for ProRail and province of North-Holland, as they focus more on a cost-benefit analysis rather than multi-criteria analysis for their partner selection

procedure. In their case, the quality criterion is converted to amount of euros, and then the most financially beneficial will be chosen. But in the case of Rijkswaterstaat, the focus was more on multi criteria analysis, including criteria such as team-working and chemistry between the parties. Yet, the price component had a considerable weight of 40% in the evaluation.

From appendix 4, it can clearly be observed that this model cannot be considered a "pure project alliancing" approach, which on itself is not necessarily a negative point but as pointed out in Elferink (2010), even though at the first instance allocating uncertainty risks to the client (such as acts of god, UXO, etc.) and realization risks to the contractor seems fairly clear, there can be instances which might bring out conflicting opinions about the boundaries of such risks. One example was in A2Hooggelegen about the maintenance of a bridge; the risk supposedly lied with the contractor but the contractor could have looked for other approaches of doing the maintenance job which would in total be more expensive but would bring the risks out of their domain (Elferink 2010). This means that such separation of risks, even within an alliance, might still undo the anticipated benefits.

Despite the above discussion and the distinction made between project alliancing and project 'design' alliancing, for simplicity of writing, the experiences in the Netherlands are in this report referred to as project alliances (thus not project design alliances).

Further information: Is project design alliancing (vs. full project alliancing) chosen as a consequence of regulation's limitations?

Unfortunately there is no published work regarding the legal feasibility of pure form of project alliancing in the Netherlands. Lack of literature shows the absence of scientific research in this area. However there are different segments written about the legal limitations and opportunities for project alliancing in the Netherlands. One (and perhaps the only) report that looks thoroughly to this issue and is aimed towards the use of project alliancing by a specific public agency and at their request, is "(Verkenning van de mogelijkheden tot toepassing van ALLIANTIES door Rijksgebouwendienst)".

In this report by discussing the concerning provisions from the governing regulations such as the 'Comptabiliteitswet', a government accounts act overseeing the finances of the public budgets, different aspects of setting up a project alliance is tested from the legal point of view. According to the aforementioned report, and the Comptabiliteitswet (clauses 32 to 39), as long as the alliance is not a legal entity itself (joint venture, SPV), not only it is possible to adopt project alliancing, but the Comptabiliteitswet even has less restraints for setting up a joint-venture than mentioned in (DTF 2006).

Another possibly related regulation on this subject is the participation policy act of Dutch government 12 December 2001. According to the report, the following points are important for project alliancing from this act:

1- The roles and responsibilities of public organizations and businesses should be distinct clearly.

Comment: Despite forming a single team (alliance) responsible for the project delivery in PA, as a principle in the project alliancing itself, the distinction of roles and functions is necessary. Meaning this provision will not be violated as a consequence of executing the right alliance. Pooling the resources and forming a single project team does not necessarily mean blurry roles and

responsibilities of the parties involved.

2- Aware risky investments are not governments function.

Comment: sharing the risks in the project alliance is not necessarily a risky investment. Depending on the project, it can even mean less risk for the client than using a conventional contract.

3- Financial win should not be the intention of the public organizations in performing market activities.

Comment: the financial benefit of the public organizations in an alliance, as a result of dividing the remaining amount of mutual risk fund between the parties, is actually a form of cost saving and not benefit as it is for private companies. Meaning what the public entity receives from the pot at the end of the project, is not an income but rather the budget not spent.

There are more issues discussed in the aforementioned report but since they refer to setting up a legal entity, or a joint-venture, they are not brought here because even in the current pure project alliance form (explained in appendix 4), creation of a legal entity is not necessary, nor common. Rather it can be seen as inadequate and redundant. However the main point is that for creation of a public-private legal entity or joint venture, the permission of senate and house of representatives is required, which can be a time consuming and lengthy procedure.

To ensure the correctness of the information provided in the report, since it was not written for publication purposes, three different meetings were arranged with legal experts (one academic individual and two individuals from private construction law firms). However since it would be out of the scope of this thesis, it is advised for further studies in the legal aspects of pure project alliancing.
By considering the results of this report, it seems that having a pure project alliance is not inhibited by the regulations in itself. However one aspect that poses restrictions is the fact that in a pure alliance, the design and project cost are determined after forming the alliance (thus after the partner selection) and partner selection ideally does not include cost consideration. This is due to the fact that with open book accounting and transparency, it is perceived that the best interest of the principal will be safeguarded and competition on cost for the partner selection is not necessary.

Nevertheless in this approach, setting a ceiling price is acceptable and also there is another mechanism that avoids private parties to take advantage of no price component in the selection: after that the price of the project is estimated, the client has the ability to accept the project, meaning giving green light for the project, or reject it and cancelling the agreements. This approach is not accepted within the EU and Dutch legislations since having a price component in the selection criteria and a verbal comparison of criteria between the bidders is necessary to promote competition between the private parties and avoid violation of equality law (The directives 2004/17/EC and 2004/18/EC).

This means, in order to avoid such problem, a cost component needs to be implemented in the tendering procedure. As a mechanism to solve this problem, Lahdenperä (2009) suggests the use of 3-limb compensation model and provides an extensive step by step model for the partner selection (please refer to the reference).

Thus the hypothesis that all the project alliances in the Dutch infrastructure industry are modeled to exclude the construction from the alliance domain and choose what can be named a “design project alliance” is due to governing regulations, cannot confidently be accepted, but rather more research is required in this field to avoid any potential confusion.

3.2.2 Project alliancing experiences in the Dutch infrastructure sector

As illustrated in figure 6, five experiences can be observed in the Dutch infrastructure sector with project alliancing. These experiences are briefly explained below in order to provide the required background for the interviews conducted in the empirical research. This research is conducted at the request of Rijkswaterstaat, the Executive agency of Dutch ministry of infrastructure and environment of the Netherlands. However due to the very limited experiences of PA in the Netherlands, in order to improve the results of the research, the experiences of other public organizations, ProRail and province of North-Holland were also used as case studies.

Waardsealliantie (1999 – 2006)

A section of the famous project Betuweroute was realized via PA by Waardsealliantie. This was the first PA in the Dutch infrastructure projects. The contract was tendered and awarded on the basis of a conventional D&C contract, and was later converted to PA. The project was realized via 3 different contracts for different sections; traditional (RAW) contract, D&C and project alliancing.

The section realized via PA is located between Sliedrecht and Gorinchem with a length of 22 km. (Betuweroute 2007) and included18 kilometers of pavement structure and 45 kilometers of rail work. 25 million euros were saved as a result of forming a project alliance. Figure 8 illustrates the end scores on key success factors.

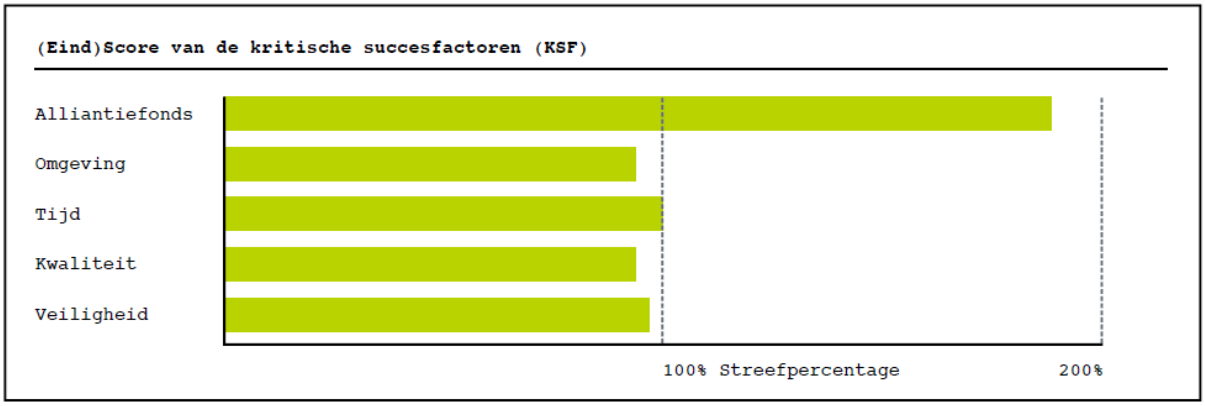


Figure 8 - End scores of Waardsealliantie on KSF of the project

(Translation of the diagram, from top to bottom: alliance fund, surrounding/stakeholder, time, quality, safety)

Betuweroute	
Participants	HBSC (**H**eijmans, **B**oskalis, **S**trukton Groep, **C**FE Netherlands) + ProRail

(ProRail 2005)

Bataafse alliantie (2007 – 2010)

The project 'Houten 4-sporig' was initially tendered as a traditional D&C contract and later converted to PA.

Between others, one of the reasons of choosing PA for this project was to have a pilot project for PA to see if it will also deliver benefit for much smaller projects (a budget of less than 50 million euros), and also to gather related experience within the organization. This project included the construction of understructure for the expansion of railway between Lunetten – Culemborg v.v. over an approximate length of 5 km (CFE retrieved 2014).

Realizations of the following civil works were in the scope of the project:

1- Two railway viaducts (approximate dimensions of 120x12x6 m)
2- Two underpasses under the 4-track section
3- Railway bridges over the existing public roads
4- Station roof with bikes' station
5- Pedestrian/bicycle bridge (De Vijfwal)
6- Staging platform
7- Noise barriers
8- Moving of a 120 years old station building to approximately 150 meters away

It was acknowledged from the beginning that the success of the project alliance depends on adequate staffing of the alliance organization. For this purpose two measures were agreed upon:

1- ProRail and the contractor should staff the alliance organization with people who can make it a success via their attitude and behavior.
2- ProRail is prepared to staff the alliance organization with extra capacity compared to a regular UAV-GC contract. This extra capacity was estimated to be 2 FTE (full-time equivalent).

Houten 4-sporig	
Participants	CH4 (Mobilis, CFE Netherlands, KWS Infra) + ProRail

According the evaluation report, 2.5 million euros were saved as the result of forming an alliance and through the optimizations due to innovation.

A2Hooggelegen alliantie (2007 - 2011)

Rijkswaterstaat
Ministerie van Infrastructuur en Milieu

Rijkswaterstaat's first and only (up to now) experience with project alliancing was A2Hooggelegen project, 2007 to 2011. This section of the report consists the highlights and summary of the book by Bloemendaal and Geest (2011), thus for further information please refer to this book. This project was labelled an experiment and a pilot project for project alliancing. The goal of such experiment was to find another approach with the private parties in order to improve the partnership, decrease the required time for realizing a complex project and to achieve positive results for all the stakeholders involved in or influenced by the project. These goals led to the following mission statement for the project:

"A2 Hooggelegen becomes an example project for successful delivering of an integral project to and by the surrounding"

A2Hooggelegen is a section of A2 Holendrecht-Oudenrijn nearby Utrecht. For this project, a covenant was signed by Rijkswaterstaat and three innovation programs and supporting organizations to realize this project in half the estimated time schedule by improvement of processes in the project. Another statement in covenant A2 was to spread the knowledge and experiences of this project in order to benefit the future projects. An impressive action with regard to this project was the agreement of 50 private firms to contribute to the ambition of the public authorities by providing them more freedom in the tendering via holding back on submitting claims for the contract awarding decision.

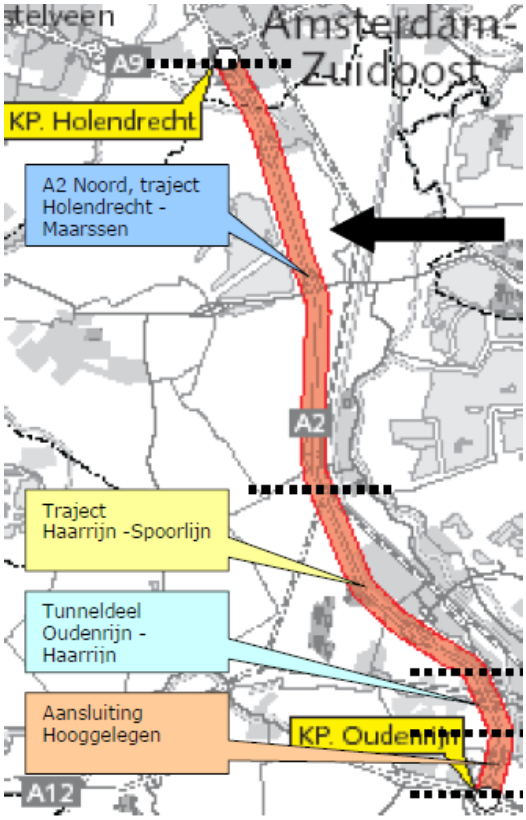


Figure 9 - A2 Holendrecht-Oudenrijn project map
(Doorn, Blok et al. 2008)

As it can be seen in the map above, this widening project is divided into 4 sections (Hooggelegen is at the bottom of the map). In order to increase the learning opportunity from this project, for each section a different contractual model was chosen. Respectively from top to bottom of the map: D&C, E&C, RAW and project alliancing.

The technical complexity of 1.7 km long A2Hooggelegen section of this project was not much different than the rest of the project, however due to very limited space and busy surrounding; this section was seen as one of the main challenges of the project. Additionally, the time pressure and planning of the project added to this challenge. Thus the decision of choosing an alliance-like partnership was made (in the beginning it was called project alliancing partnership however due to some adjustments to the model, the term alliance-like partnership was chosen for it).
The contracting process of A2 Hooggelegen started with a briefing on November the 3rd, 2006. Competitive dialogue was chosen as the contract awarding procedure. By means of prequalification criteria, 5 parties were selected for the next round. In March 2007 the first phase of dialogues, including two dialogue rounds, was conducted which resulted in selection of three parties for the next round. In this stage, these three parties had to conform to the ceiling price of 140 million euros. It should be noted that this ceiling price was an “approve or reject” criteria, with no quantifiable point for the bidders. Thus any price lower than this, would be acceptable by Rijkswaterstaat. The

second phase of dialogues which contained 5 rounds of talk and a workshop started in May. The assessment in this round was based on the MEAT criteria (40% price – 60% quality). The results of the workshop also served as part of the quality criteria. The final awarding of the contract occurred in November. The contract was tendered and awarded as PA, based on a conventional UAV-GC contract.

A2Hooggelegen	
Participants	Trajectum Novum (VHB, KWS Infra, Mourik Groot-Ammers, Vialis, Boskalis) + Rijkswaterstaat

Key results of the project are as below:

- Time:
  - 2 years and 10 month (for comparison: 3 years and 2 month demanded by the contract, 4 to 5 year estimated as normal practice)
- Budget:
  - within the maximum budget allocated to the project
- Traffic hinder:
  - main road < 4% increase in congestion severity (< 5.5% demanded by the contract)
  - secondary roads: no extra travel time (< 25% demanded by the contract)
- Safety:
  - One accident (a broken finger), normal practice: 2% of the workers per year (equals to 6 incidents in this case)
  - No road user accident due to the project
  - No safety violation according to the inspectors or client
- Quality:
  - Quality management system CMMi level 3, as demanded by the contract
  - 6 shortcomings, maximum shortcomings allowed by the contract 20
- Image and reputation:
  - 95% Stakeholders satisfaction rate (demanded by the contract: 70%)
  - 91% Road users satisfaction rate (demanded by the contract: 70%)
  - 114 complaints received (normal practice: 450 complaints) and 98% solved within 5 working days (Doorn, Blok et al. 2008)

N201 Alliantie (2007 – 2012)

Provincie Noord-Holland

Aalsmeer-Uithoorn is a project within the domain of N201+ master plan. This master plan is aimed to improve the accessibility, quality of life and safety in the area between A4, A9 and Uithoorn in order to keep the areas around Schiphol and Flora Holland economically vital. Aalsmeer-Uithoorn project is itself divided into 7 subprojects which were all realized via traditional contracts (RAW) except for one part which was realized via alliance contracting. The drivers for choosing project alliancing for this part were the expected complexity of the project during the relatively long construction period, the construction of a tunnel under the ring canal and the perspective of potential design optimizations that could lead to a lower construction cost.

The tendering of the project was on the basis of a D&C contract, one of the first D&C contracts in the provincial road projects. The possibility of forming an alliance was mentioned in the tendering documents but took place after awarding the contract.

This project alliancing was influenced by the following factors:

- All the parties had very little experience with new contractual models, let alone with project alliancing
- The experiences of Waardse Alliantie (Betuweroute) were studied and considered
- There was enough time for the negotiations required for alliancing
- There was enough time to mutually bring the risks and optimizations in the picture

According to the evaluation report of the project, the optimizations and chances were measured too generously and the risks too positively. However in the end, € 3.2 million was saved through the optimizations done in the alliance (PNH 2013).
The result of the evaluation report is positive and the conclusion is drawn that realizing the project via PA, was a success.

Project Alliance N201	
Participants	Heijmans, Boskalis + Province of North-Holland

Alliantie Amstelspoor and Alliantie WALTZ (2010 – 2016 expected)

OVSAAL is a railway project between the areas of Schiphol, Amsterdam, Almere, Lelystad (SAAL) to increase the capacity of the rail network due to the increasing number of travellers. Since the project is located in a very busy area, a challenge is the surrounding and stakeholder management for the project.

This project is part of a larger program which is planned to be realized in three phases:

1- Short-term to be realized till 2016 (what is currently being done)
2- Medium-term to be realized till 2020
3- Long-term to be realized after 2020

One interesting action by ProRail regarding this project was to put the project for tender in two separate segments, despite being considered one for ProRail itself. This way not only they tried to benefit more from the competition between the market parties, but also they intended for more private parties to get the chance of working in PA partnership. This means, despite allocating one project to be realized via PA, the experiences would virtually be doubled.

OVSAAL	
Participants (South-east section) – "alliantie Amstelspoor"	BAM combination (BAM Civiel, BAM Rail, BAM Wegen, BAM Infratechniek, BAM Infraconsult) + ProRail
Participants (South-west section) - "Alliantie WALTZ"	Nieuwe Meer Sporen combination (VHB, VolkerRail) + ProRail

Observations:

- All of the aforementioned projects use the same model of project alliancing; a D&C basis with an overarching project alliance contract that puts the design and the surrounding/stakeholder management in the domain of the alliance but the construction is still kept in the domain of the contractor alone. The public actor also has its own separate risks such as unforeseeable incidents and etc.
- Three of the 5 projects started in the same year, right after the completion of the first PA experience. The year 2007, can be seen as the most popular year for PA in the Netherlands.
- The motive for three different project alliances in the year 2007 can be due to success of the Betuweroute or due to the parliamentary enquiry regarding the construction fraud of 2002 which motivated public authorities to use new partnership models for repairing the damaged trust between the parties.
- A2Hooggelegen and OVSAAL projects were tendered as project alliances from the beginning, however the other projects were tendered as D&C contract but PA was implemented after the awarding procedure.
- All of the above mentioned projects, except for OVSAAL which is still in the construction phase, have received positive feedback in their evaluation reports and are in general considered successful projects.
- 5 of the private companies mentioned as participants in the above projects, were involved in at least two PA's (KWS, VHB,Boskalis, Heijmans, CFE Netherlands). This is regardless of any international experiences that the private companies might have with PA. This can be seen as a factor in the rapid experience gain by the private parties. In other words, it should not be assumed that due to the much higher number of private parties (compared to public parties), the knowledge in the private side is scattered. Since all of the PA's in the Dutch infrastructure sector were realised by combinations, rather than a single private company, the learning opportunity was increased for the private parties.
- According to Plantinga and Dorée (2013), for ProRail, the changes and choices made in terms of the particular alliance domain (the responsibility domain of the alliance organization) are mostly implicit and only sparsely explained by motivations. However it should be mentioned that this observation is based on a broader definition for project alliancing than it is considered in this thesis. In their definition, Plantinga and Dorée (2013) considered 'real gain-/pain share' the sole determiner in identifying project alliances. With this definition, ProRail is considered to have 8 project alliances (versus the 3 project alliances introduced in this research).

Chapter Summary

Relationship contracting:

- In response to the shortcomings of conventional contracts, relationship contracting is created and focuses more on the process (relations) and how this process can be optimized to improve the results of the projects.
- There are three widely known branches for relationship contracting; project partnering, integrated project delivery and project alliancing.
- All these three focus on the development of soft skills and alignment of the interests, however PA is the only one that is considered a full PDM, with a clear hard structure that is designed to facilitate such development.
- Project Partnering (PP) is considered to be a moral agreement between the parties to enhance the levels of cooperation and collaboration between the parties by encouraging alignment of interests.
- Integrated Project Delivery (IPD) is a project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to reduces waste and optimize efficiency through all phases of design, fabrication and construction.
- Project Alliancing (PA) is a project delivery method based on a joint contract (legally binding), involving the key public and private actors respectively as principal and agent, as early as possible in the process for a single project whereby the parties assume joint-responsibility for the design and construction of the project to be implemented through an integrated project team and joint organization (not a legal entity), and where actors share both positive and negative consequences via a pain/gain sharing mechanism that aligns their commercial interests and ties it to the end result of the project, thus is founded on the basis of best for project attitude and aims to create a win-win situation through optimized teamwork and proper platform for the development of soft skills.

Project alliancing in the Netherlands

- There are to this moment 5 projects realized via PA in the Dutch infrastructure sector.
- All these 5 project alliances are made of an integrated alliance team which is responsible for the design and surrounding/stakeholder management of the project. However the contractor is still fully responsible for the execution. As a result, it is suggested to use the term ‘project design alliancing’ for the experiences in the Netherlands.
- Only three public organizations in the Netherlands have had at least one experience with PA; ProRail, Rijkswaterstaat, Province of North-Holland.
- All of the completed project alliances are considered to be successful, according to the evaluation reports and publications regarding them.

4. Literature Study (2): Potential Organizational Barriers for Adopting PA

In the second chapter (research design), the line of reasoning behind starting this investigation from the organizational barriers is explained thoroughly. In this chapter however, the focus is on finding the theoretical organizational barriers for adopting project alliancing. The results of this chapter will form the theoretical basis for conducting the empirical research and will answer the last sub-question of the research.

In order to ensure the interviews would run smoothly and open up opportunity for in-depth investigation of barriers, an interview protocol was prepared. Since the interviews are semi-structured, it is only required to find some potential barriers as discussion points and discover the rest during the interviews by giving room to the interviewees to steer the conversation towards what they find most important.

For this purpose, a literature study was conducted with regard to the potential barriers. The first step to find the appropriate literature was using the information gathered from a handful of meetings and discussions conducted by the author within the Rijkswaterstaat. Since these meetings were conducted in an early phase of the research, they would only provide general information about what sort of barriers could be expected along the way. Another source for finding the appropriate literature was the different aspects of Project Alliancing and how it will affect the organization if practiced on a regular basis.

Consequently the following four main categories of potential barriers were found: barriers of utilization of research (section 4.1), barriers to applying and diffusion of innovation (section 4.2), barriers to potential organizational changes required (section 4.3) and finally barriers to adopting PA (section 4.4). The first three are on a more general level and to some extent can also be the case for other innovations or new procedures. But the last is specifically faced towards PA. It should be noted that these categories were only developed to find the appropriate literature for drafting the interview guide by having a multi-façade approach and do not define the final results of the research.

4.1 Utilization of research

Before getting into the details of potential barriers that can be put in this category, first the lack of proper researching should be introduced and explained. It is important for organizations to spend enough amounts of resources in their R&D before committing to a new process, tool or technology. Conducting proper researches would ensure that the organization has enough knowledge about what it should expect and what the challenges ahead can be. On the other hand, the lack of it causes even small challenges to be handled without enough knowledge and thus becoming substantial problems. **[Lack of proper researching]**

Applying the findings of researches to practice has always been facing challenges. This is mainly due to research-practice gap. Although this gap is far more for theoretical research, challenges for actual translation of findings of applied research to practical measures are also noteworthy. Since the development of PA has been done as a response to the practical problems in the construction industry, it is considered an applied research. Applied research can be broadly distinguished from theoretical research through its requirements to meet specific information needs and its potential for actionable outcomes (Huberman and Miles 2002) And the success of an applied research is its contribution to the solution of specific practical problems (Roll-Hansen 2009). This success has been acknowledged for PA according to the successes achieved by it in Australia and a number of projects in the Netherlands. But what makes the application of project alliancing more complicated is that it is

not only a new tool, it has strong collective elements embedded within it, requiring behavioural, relational and cultural changes.

Thus PA in construction industry (namely in the countries and markets not used to such a way of doing business) can be seen not only as an innovative tool, but also as an innovative policy. By requiring relatively large change in the current state of partnerships, the organizations seeking to practice PA, must also be willing to accept a policy change. This policy change in the broad sense can be defined as a change towards more collaborative partnerships, with trust and transparency.

Therefore the translation of PA, from research to practice, also includes a policy research. It should be noted that if the practices in the construction industry were more alliancing/partnering oriented, the policy research for PA was not as essential as it currently is. This policy research applies the social scientific findings, in order to change the problems currently being faced in the construction industry. A policy research in principle will focus on actionable or malleable social factors to a greater extent than theoretical research (Marshall 1998).

As Corwin and Louis (1982) argue, a key reason that research findings frequently do not seem to have a discernible influence on administrative practices is that they are conducted in a policy vacuum. Corwin and Louis (1982) further explain policy vacuum as the absence of the following 5 measures:

1. An organizational constituency of policy makers
2. Identifiable policy issues and research questions
3. Consistent policies and clear policy options
4. Coordination among the independent agencies responsible for a policy area
5. An ongoing, operational program that can make use of the findings **[Policy vacuum]**

This means that if a new concept is being researched on, it is important for its administrative practice that the concerning policies for its application is also included in the research. Putting this in the context of this research, it should be investigated whether the appropriate policy for practicing and adopting PA is developed within Rijkswaterstaat or not.

A potential opening for the policy development for PA within Rijkswaterstaat, is building on the policies regarding the “co-creatie” or co-creation concept, introduced a couple of years ago but currently being on the spotlight. By co-creation Rijkswaterstaat aims to increase smart collaborations, smart coupling and integration of approaches with other parties. As explained by the director-general of Rijkswaterstaat, true “co-creatie” can only be achieved by vertical integration of projects in the construction chain. This will lead to a culture were the interests of clients and contractors are in balance and transparency, trust, mutual respect and knowledge is the binding link for their relationship (Dronkers 2013). Since these are also the values promoted by PA, it seems using PA falls right into the framework of “co-creation”, thus the policy research and development for these two concepts will most probably have a lot in common. However since the concept of “co-creation” is still in the beginning phases of forming, it might be a couple of years before a clear policy with regard to it is shaped.

Furthermore a number of writers have lamented that applied social research typically does not have a clearly discernible impact on administrative practice (e.g. see Bernstein and Howard (1975); Lindblom and Cohen (1979)). These writers have also proposed numerous reasons to help account for the failure of funding agencies to use organizational and other types of research. Most of these explanations focus on individuals rather than on organizational characteristics. For example some

writers point to the fact that many administrators don't really want the information they ritualistically commission (Downs 1965; Knorr 1977) **[Ritualistic behaviour].** Others stress the poor quality of much applied research (Wilensky 1967; Bernstein and Freeman 1975; Perrow 1986) still others blame the researcher for being insensitive to the personal cognitive and decision-making needs of the practicing administrators or for lacking necessary inter-personal skills (Argyris 1972; Pettigrew 1975; Lindblom and Cohen 1979). **[Research deficiencies]**

Furthermore it should be investigated whether the research and development of PA, are generating actionable outcomes for organizations willing to practice it. However this process should not be seen as a one way measure, but rather if the outcomes are reasonably feasible, the organizations should also apply the necessary modifications within their structure and policy in order to be able to benefit from them. A smart organization is an organization constantly improving through changes. (Matheson and Matheson 1998) **[lack of actionable outcome/steps]**

4.2 Applying and diffusion of innovation

Before getting into details of innovation diffusion and the barriers that can obstruct the path towards it, first it should be explained why project alliancing should be considered an innovation, despite that it has been used for more than a decade in some parts of the world.

In their book,O'Sullivan and Dooley (2009) describe innovation as a process that helps organizations grow. This growth can be in terms of monetary and measurable terms, such as profit or turnover, or in terms of knowledge, human experience and quality. They define innovation as "the process of making changes to something established by introducing something new". This process can be radical or incremental, and can be applied to products, processes or services in any organization. Furthermore by considering the definition of innovation according to the Webster dictionary (retrieved May 11th 2014), "the act or process of introducing new ideas, devices or methods", it can be concluded that not only innovation is seen as a process, but also this process can be for the purpose of developing a new method. O'Sullivan and Dooley (2009) continue to build on the definition of innovation and eventually propose the following definition for applying innovation:

"*Applying innovation is the application of practical tools and techniques that make changes, large and small, to products, processes, and services that result in the introduction of something new for the organization that adds value to customers and contributes to the knowledge store of the organization.*"

Furthermore by distinguishing the three categories of innovation; products, processes and services, O'Sullivan and Dooley (2009) define process innovation as 'the introduction of a new or significant improved method for the production or delivery of output that adds value to the organization.' Additionally, Davenport (1993) discusses process, in the context of process innovation, as what implies a strong emphasis on how work is done within an organization, in contrast to a product focus's emphasis on what. Moreover Davenport (1993) makes a distinction between process improvement and process innovation; the former referring to slightly improving the current processes and the latter refers to radical changes in the current processes. As it will be explained in the next section, project alliancing does not require radical organizational change, but does bring substantial process change. Additionally Rogers (2003) points out that that the newness in an innovation does not just refer to new knowledge of it but also to its persuasion or a decision to adopt it.
These definitions perfectly fit the current status of Project Alliancing, as a project delivery system, in the Netherlands. PA is a new method for the delivery of construction projects, that adds value to

both the client's and the contractor's organization by offering flexible remedies to the problems caused by other, more conventional project delivery systems. And most importantly, by improved public-private cooperation, the users will also benefit more due to aspects such as life-cycle consideration, innovative solution seeking, better stakeholder management and etc. Thus by studying the barriers towards applying or diffusion of innovation, and focusing on the ones applicable to process innovations, a good sense of barriers with regard to development of PA can be achieved.
Now that project alliancing has been defined as a process innovation, it is noteworthy to consider two more differences Davenport (1993) mentions between process improvement and innovation;

- Process improvement usually requires only cultural change but process innovation requires both cultural and structural changes.
- Process improvement is usually done by bottom-up participation but process innovation by top-down. **[Not enough initiative from the directors]**

In order to avoid confusion, it should be noted that adopting project alliancing as a project delivery tool in an organization, is process innovation but project alliancing itself is a continuously improving process, thus after its adoption , the focus will go to process improvement.

Rogers (2003) uses the term "diffusion of innovation" when noticing that getting an idea adopted, even when it has obvious advantages is difficult. He defines diffusion of innovation as the process which an innovation is communicated through certain channels over time among the members of a social system. What concerns the adoptability of an innovation in view of Rogers (2003), is that the greater the following attributes of innovation, the faster it will be adopted (or diffused).

- Relative advantages: the degree to which an innovation is perceived as better than the idea it supersedes. **[insignificant relative advantages]**
- Compatibility: the degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of potential adopters. **[incompatibility]**
- (Less) complexity: the degree to which an innovation is perceived as difficult to understand and use. **[high complexity]**
- Observability: the degree to which the results of an innovation are visible to others. **[complex observability of the benefits]**
- Trialability: the degree to which an innovation can be experimented with on a limited basis.

It is implied that high complexity and low relative advantages, compatibility, trialability, observability would lead to slower adoption, thus can here be used as potential barriers. However trialability is not included in the interview guide as it is clear since PA is a project delivery system, experimenting with it means practicing it on a project. And the relative high level of commitment this requires makes trialability an obvious barrier.

One interesting pitfall that Rotmans (2006) finds troubling in applying innovation is the occurrence of backlashes, whereby too soon or thoughtless applying of an innovation can cause wide spread lack of acceptance, support and commitment. This phenomenon occurs when due to rushing into a new path, the potential obstacles ahead have not been anticipated beforehand. Thus after applying the innovation in a single or even several cases, the problems become visible and by not being ready to manage them, the applied innovation gets a bad reputation despite the fact that all those problems could have probably been prevented with simple measures beforehand.

To prevent such backlashes, it is important to give enough room for learning about the new path in advance and only going towards it after gaining enough confidence. In the context of this research,

the possible backlash might be seen with regard to pilot projects. Despite being considered successful, there is a possibility that the pilot projects have not been living up to the expectations, thus causing the backlash of PA. One example for this purpose can be the gradual growth of the scope of the projects, leading to increase in budget required. Despite the rational reason for this increase in project cost, it can still be viewed as "cost overrun" by some, thus questioning the success of the project in this regard. However since this growth of scope was due to associated operations with the original scope and were added as a result of their potential negative effects on the schedule of the project if handled otherwise, with the right planning it could have been foreseen. **[backlashes of the experiments]**

Another interesting potential barrier for applying innovation in large organizations is having an isolated innovation department. This means that the innovation to be adopted, is not spread in the organization effectively, or as explained by Tucker (2008), the rest of the organization consider themselves not having any stake in the innovation or the new idea. As a result, they will not be adopting or applying that innovation. **[An isolated innovation department]**

4.3 Organizational change

As a result of applying innovation, changes in the organizational procedures/process might be required. Thus as O'Sullivan and Dooley (2009) point out, there is an overlap between change management and innovation management within the organizational context. By definition, a process innovation requires changes in the processes of an organization.

Organizational change is the process of converting an organization from its current state to some future desired state. In the context of this research, organizational change is the change of current state of affairs to the one embracing the PA mentality. However due to the fact that simply put PA is a new project delivery system, the organizational changes needed for embracing PA will most likely be concerned with only a few limited aspects of the organization, thus dramatic changes might not be the case for this purpose. In other words, organization redesign or reengineering is not the case. But still the importance of investigating the barriers towards change is obvious.

Furthermore it should be noted that organizational changes, however small, can be crucial for opening the way for use of new methods, such as PA. Angehrn (2005) mentions resistance to organizational change as the most important factor for the failure of large organizational change projects. But resistance to change, as a barrier, can be caused by several other barriers, thus it needs to be studied and analysed in order to find its root causations.

As Ning and Ling (2013) put it, compared to the private sector, the public sector shows greater reluctance to make rapid changes and they usually prefer to select the traditional routines even if they agree with the RC in theory. They further quote Eriksson, Nilsson et al. (2008) in this context: "conservative industry culture inhibits changes and encourages preservation of the status quo". Or as Tucker (2008) puts it, the aggressiveness toward breakthroughs or towards incremental innovation depends on the "industry clock speed", which is basically the rate of change that the intended industry is experiencing and the pace at which products, services and even business models are becoming obsolete. This industry clock speed is quite slow for construction compared to most other industries, as it can be observed from only limited or small changes over the past two decades. **[resistance to change in the industry]**

Furthermore Rotmans (2006) explains that integrated innovation processes rise resistance due to the established interests, values and norms during its proceedings. Translating this to organizational process changes, the resistance can be caused due to issues such as people feeling threatened by the changes that might affect their position or function. By long era of using conventional contracts, organizations have invested in skills that are inappropriate for project alliancing, such as dealing with issues on a contractual basis. Thus any change that might devalue such expertise might be resisted against (Scott 2001) **[resistance due to interests, values and norms].** Even though this might not be such a large scale change and only require some adjustment, but still perception and sensitivity of people about it can be exaggerated.

Tucker (2008) points out that '… resistance is palpable, but subtle, and you may not even be sure where pushback is coming from'. That's why Rotmans (2006) suggest changing the dominant perspective of people with regard to the intended theme as one of the most important conditions for it to be realized. And this can only be done by increasing the awareness and knowledge of the people in the organization. In a smart organization, changes occur due to awareness and not due to hierarchical commands.

Another reason why resistance to change might occur is having a long era of past success. This can cause every decision to change to be resisted and eventually refused without even investigating it thoroughly, since the current way of operating has been proven to be successful; despite the fact that the organization might be losing a golden opportunity. In this case, the past successes would become a barrier themselves and hinder the organizations growth. **[Long era of past success causing resistance]**

A barrier for organizational change identified in the literature, is the unfitting organization culture (Smircich 1983; Schneider, Brief et al. 1996; O'Sullivan and Dooley 2009). Tucker (2008) defines culture as what *'… refers to an organization's values, beliefs and behaviours. It is transmitted through subtle cues, through employees sharing their interpretations of events, and largely through the behaviours and attitudes of leaders that signal what is expected.'* The organizational written and unwritten culture could be different; the latter can only be observed from the inside and is what everyday decisions are affected by. Thus just for the reason an organization is promoting risk taking and innovation on the written documents and statements, it does not mean that this attitude is actually being practiced or even truly encouraged within it **[Unfitting organizational culture, risk averse culture, etc.].** It is easy to promote innovation by words and discourage it by signals such as lack of support, harsh consequences for failure and etc. An organizational culture that promotes "go along to get along" mentality will hold back improvements that require change. Scott (2001) mentions the following cultural barriers for adopting project alliancing:

- Little low-level empowerment
- Little peer group contact
- Blaming not sharing
- Reluctance to communicate freely
- Ingrained distrust
- Investment in inappropriate skills
- Avoidance of personal accountability
- Rigid roles and procedures

As Rotmans (2006) mentions in his book, Path-dependent development can be an important barrier for large scale society changes. However this barrier could also be extended to the developments within organizations. Path-dependent developments says that the choices made in past, provide a

particular path of possibilities for the present. Examples of the causes for this barrier that concerns the process change of project alliancing are entrenched mind-sets, thinking and ingrained behaviours due to long time use of DBFM and D&C contracts. This might have caused the two aforementioned contract types to become the 'norm' and shape the decisions of Rijkswaterstaat with regard to aspects such as expertise, resources and procedures. By more and more entrenching of these two contract types within the written and unwritten culture of the organization, the development of other contract types would become more difficult, especially if people seem stuck in their ways of operating and perceptions.

As Rotmans (2006) further mentions rowing against the stream can be difficult and therefore requires a momentum for it to be successful. This momentum for project alliancing in Rijkswaterstaat could have been the A2Hooggelegen project. But due to not practicing project alliancing in the past three years after the pilot project, this momentum has been slowly fading away and making the intended transition of PA more difficult. **[Path-dependent development]**

Short-term thinking is another potential pitfall which is worth to explore within this research. Even though it is important to consider both the short-term and the long-term gains for an innovative process, it is seen that short-term thinking causes more attention to be given to short-term gains. For a dynamic process such as project alliancing that requires development and constant improvement over time, this short-term thinking can be a huge barrier. The cultural and mind-set change that distinguishes PA from other PDMs, cannot happen overnight and require time; Especially if the organization has been working years and years in the mental framework of a completely different, and even opposing, PDMs. Therefore it would be unreasonable to expect full potentials of PA to be achieved within the first experiences. However short-term thinking is, and probably will be, a realistic problem for the development of not only PA but any other similar new processes within an organization. **[Short-term thinking]**

4.4 Barriers to adopting PA

In their article Ning and Ling (2013), identify 23 barriers to the adoption of relational transaction practices (such as PA). These barriers were further categorized into 10 categories. However despite the fact that Ning and Ling (2013) developed these barriers for the failure of RC projects, some of them can be adjusted to the long-term use of RC. It should be noted that here, the concepts of these barriers are adjusted such that to reflect what concerns the scope of this research and thus the definitions can be a bit different than the referenced article. Furthermore some of the barriers mentioned in the referenced article are not included here as they were directly concerned with the execution of alliance projects, within the scope of a project, and not the process of practicing PA.

1- Incompetence: Client's lack of knowledge, contractor's lack of capability and improper planning are included in this category. However what concerns the scope of this research (internal barriers) are the client's lack of knowledge and the improper planning. It is clear how lack of knowledge within the client's organization with regard to PA can be a hindrance for practicing it; firstly it could mean that the client simply does not have enough knowledge about what PA actually is thus not motivated enough to spend resources for its development and secondly it could be that the client's organization has some limited knowledge about PA and thinks it knows what PA is but has the wrong impression or misguiding knowledge that negatively affects their perception of PA. The latter could be much more difficult to overcome as it will cause any further efforts for research and development of PA to be disapproved or simply discouragement towards investigating the potential possibilities it has to offer. On the other hand, there is the problem of lack of related skills (such as project

management skills required) that might give the client the perception that they cannot practice PA. However as Scott (2001) points out, this problem can simply be solved by supplementing the owners organization with external consultants and experts. Ultimately the concern for lack of skills would diminish by more related experiences.

Improper planning, on the other hand can occur even when the client has enough knowledge of the subject matter. This has to do with the competencies of an organization to develop a feasible plan that would guide them towards the intended destination and ensures that the organization can act collectively when necessarily. Without such plan, the organization's efforts might not be aligned and with the right direction, also by not having a clear guide, the destination can be seen as a farfetched concept. **[Lack of Knowledge and skills] [improper planning]**

2- Commitment: three issues in this category are important to this research; lack of top management support, lack of client's initiative and lack of real commitment for improvement.

   a. Top management support is essential for a new process to be embedded in the procedures of an organization. But as Gilmore (2009) points out, the statement "need for senior management support" has been widely used in publications without clearly defining it. Furthermore lack or existence of support from managers is more complex to grasp than imagined in the first instance. There are several implications other than managers simply not providing support due to their informed decision, most importantly managers can consider themselves providing the required support but in reality the opposite could be true. This can happen mainly due to three reasons: firstly managers not comprehending the full scale and impact of the issue in need of support, and secondly managers might intellectually understand the issue at stake but not connecting to it on a deep level to consider it as a priority. And finally due to the fact that they merely do not have any good reason to reject the issue at stake but on the other hand are also not committed to it, thus accepting it without believing in it. Real support from the managers means devoting enough resources, preparing the conditions and convincing the other roles within the organization to get on board with it. This indeed would be done only if the managers are "fully committed" and provide "real support" for the matter. Anything less could mean a lack of buy-in from the management and could be a significant initiative killer.(Tucker 2008) **[lack of top management support]**

   b. Client's initiative in PA has already been mentioned in this thesis as a reason to focus on the internal barriers first, since without it the private parties will not feel secure enough to spend resources on the development of PA. But what concerns the client's initiative as a barrier in this research is not just initiating an alliance project, but is to increase awareness for a need to change, provide resources for investigating the possible solutions and finally increase knowledge of the solutions found. **[lack of client's initiative]**
   c. The traditional working environment has not encouraged a commitment to improvement. Specially in hierarchical organizations, there are several problems contributing to this; difficult vertical communication, suspicion on managements real willingness for change, fear of resistance and etc. **[lack of real commitment]**

3- Adherence to rules and codes of conduct: Ning and Ling (2013) point out that public sectors accountability concerns and attempt to avoid possible allegations of corruption arising from close relationships between the client and other contracting parties can be seen as a barrier to practice RC. Ling, Ong et al. (2014) state that the close relationship, partly required and partly achieved as the result, which is one of the main reasons for good outcome, may lead to allegations of corruption. This concern is indeed needed but combined with lack of knowledge might prevent the public organizations to practice PA, despite the fact that with the right adjustments, PA can be practiced completely within the existing regulations and legislations. Thus making this a false concern. However the perception of people with regard to it can still be misguided. **[accountability concerns]**

The adoption of project alliancing can impact the traditional procurement functions in an organization. Traditional procurements, maintained a power distance between the client and the contractor, by means of the contract. This gave the client formal power dominance over the contractor. However as mentioned before, project alliancing is looking to decrease the power distance between the parties in order to stimulate teamwork and cooperation. Thus this loss of formal power can be seen undesired (Scott 2001). In this respect, the already explained trust-control dilemma plays an important role; whether the client's organization is willing to move towards trust on this balance or not. Consequently, in addition to the above mentioned potential barriers, wanting full control over the projects can be identified as a barrier as well. **[control vs. trust]**

Chapter Summary

Potential Organizational Barriers for Adopting PA:

From the literature review, the following 25 potential barriers were identified. These barriers were used to design an interview protocol to be used for the empirical research.

1. [lack of proper researching]
2. [Policy vacuum]
3. [Ritualistic behaviour]
4. [Research deficiencies]
5. [lack of actionable outcome/steps]
6. [Not enough initiative from the directors]
7. [insignificant relative advantages]
8. [incompatibility]
9. [high complexity]
10. [complex observability of the benefits]
11. [backlashes of the experiments]
12. [an isolated innovation department]
13. [resistance to change in the industry]
14. [resistance due to interests, values and norms]
15. [Long era of past success causing resistance]
16. [Unfitting organizational culture, risk averse culture, etc.]
17. [Path-dependent development]
18. [Short-term thinking]
19. [Lack of Knowledge and skills]
20. [improper planning]
21. [lack of top management support]
22. [lack of client's initiative]
23. [lack of real commitment]
24. [accountability concerns]
25. [control vs. trust]

Empirical Research

- Findings of group 1 interviews
- Findings of group 2 interviews
- Validation round interviews

5. Empirical Research

In this chapter, the findings of empirical research will be presented. The empirical research was conducted by means of interviewing the public organizations' personnel (in the first instance, the project teams/project specific personnel and later for a validation round, the directors) who had experiences in project alliancing.

The reason to start with the project specific personnel is that due to their involvement in the experiment on a daily basis, their perception of the barriers can be more detailed. And also since communication is more frequent from directors to the project teams (than project teams to the directors), starting with the project specific personnel would provide an opportunity to overcome the potential one-way communication about the barriers.

In order to include a complete range of interviewees and acquire good insight, the potential participants were searched from the very beginning of the project (preparation phase) all the way to the project delivery. This ensures that the different experiences and perceptions are included in the research and the barriers are not based solely on one specific function group. Tender managers, alliance managers, surrounding and stakeholder managers, and contract managers were the main focus since these are the domains that public organizations are concerned with the most.

Afterwards, by interviewing the directors, it is tried to complete the overview of the barriers by interviewing diverse functions on the different levels of the line organization. For the validation round, all the interviewees are internal (from Rijkswaterstaat), and their eligibility was based on their function and how they can influence the adoption of PA within the organization.

Interviews

In this section, the findings from the interviews will be presented and explained. As already mentioned, the main interviews are divided into two groups; group 1 includes the internal interviewees (from Rijkswaterstaat) and group 2 includes the external interviewees (outside of Rijkswaterstaat). The findings of each group are separately analyzed and for each group, a schema of the barriers for adopting PA will be presented. The structure of the analysis is the same for both groups, firstly a general view of the barriers is provided and then each barrier is explained. The findings are based on the interview quotes, which are all marked in the results between curly brackets ({}) and a number following the letter Q (e.g. {Q1} refers to quote # 1). These quotes are to be observed from appendix 7.

These findings will conclude the initial results of the research, afterwards with the validation round, the final conclusion will be drawn. The result of this research is based on 27 interviews in total. The following table demonstrates the different interviewees of the research.

Table 1 - The interviewees

Interview Group	Interviewee #	Organization representing	Project involved
1	1	Rijkswaterstaat	A2Hooggelegen
	2	Rijkswaterstaat	A2Hooggelegen
	3	Rijkswaterstaat	A2Hooggelegen
	4	Rijkswaterstaat	A2Hooggelegen
	5	Rijkswaterstaat	A2Hooggelegen
	6	Rijkswaterstaat	A2Hooggelegen
	7	Rijkswaterstaat	A2Hooggelegen
	8	Rijkswaterstaat	A2Hooggelegen
2	9	Province of North-Holland	N201
	10	Province of North-Holland	N201
	11	ProRail	Houten 4-sporig
	12	ProRail	OVSAAL
	13	ProRail	OVSAAL
	14	ProRail	OVSAAL
	15	ProRail	OVSAAL
	16	ProRail	OVSAAL
	17	ProRail	OVSAAL
Validation	18	Rijkswaterstaat	-
	19	Rijkswaterstaat	-
	20	Rijkswaterstaat	-
	21	Rijkswaterstaat	-
	22	Rijkswaterstaat	-
	23	Rijkswaterstaat	-
	24	Rijkswaterstaat	-
	25	Rijkswaterstaat	-
	26	Rijkswaterstaat	-
	27	Rijkswaterstaat	-

5.1 Findings of Group 1 interviews

Group one interviewees consist of project team and personnel of Rijkswaterstaat involved in A2Hooggelegen. In total, 10 people were identified as eligible for this group. 8 out of 10 eligible candidates agreed to participate in an interview session. The interviewees had different roles in the project and it was tried to cover at the very least, the tender manager, surrounding/stakeholder management, contract manager and the alliance manager. The reason for this was that these roles, not only cover the starting point of the project's process in the organization (tender and contract manager), but also are the main fields of activities of the public organization in the alliance team (surrounding/stakeholder and alliance manager).

Table 1 demonstrates the different cluster of barriers for adopting PA from the perception of project teams. As it can be seen, these barriers are categorized into four groups; root barriers, project organizations, line organization and finally shared between the last two. The names of all the categories but one are self-explanatory; however the root barriers need more insight to be understood. Root barriers refer to the barriers that are considered to be more dominant and concern the whole organization. The root barriers influence the rest of the barriers and are on a more general level than the other categories. In other words it can be said that all of the barriers identified are somewhat affected by the root barriers. However this does not imply that by eliminating the root barriers, the other barriers will abruptly be eliminated, yet the appropriate setting for the removal of other barriers will be provided.

The relationships between the barriers are more complicated than can be observed from the following table. Thus this table should be seen as a simplified way of bringing all the barriers together. Later a diagram will be used to demonstrate the relationship between the barriers (figure 10).

Table 2 - Findings of group 1 interviews

Barrier	Category	Counts (out of 8)
Shortage of personnel	Root barriers	8
Not enough investment in knowledge	Line organization	8
No clear policy towards PA	Root barriers	7
Not a priority	Line organization	6
Not suiting organization culture	Shared	6
Backlashes of the experiment	Project organizations	6
Unforeseen next step (process planning)	Line organization	5
No standard framework available for PA	Project organizations	5
Not enough promotion for PA	Shared	5
External influences (Political)	Root barriers	4
Not enough leadership/initiation from the directors of line organization	Line organization	4
High level of friction between the alliance and the main organization	Project organizations	4
Not enough motivation for the project teams	Project organizations	4
Accountability concerns	Shared	4
Lack of champions	Line organization	3
Complex observability of advantages of PA	Project organizations	3
Operational problems	Project organizations	2
Unsuitable project sizes	Root barriers	1

A point of attention is that, this research is not a quantitative research, thus the counts of barriers mentioned should not be seen as a strong indicator but rather as a soft indicator showing the general opinion. Furthermore the criticality of barriers is not based on the counts of barriers, but rather on the argumentations provided. This is due to the fact that a specific barrier observed only by a single interviewee could be a “show-stopper” but since it is not in the function domain of other interviewees, it is not observed by the rest. However since the interviewees have different domain of activities, if a barrier is identified by a number of interviewees, it is an indicator of that barrier being observable in different functions’ domains. And if a barrier is only identifiable by a single interviewee, it shows that the identified barrier is limited to the domain of activity of that interviewee and not the rest of the organization. In other words, the higher the counts of a specific barrier, the more widespread it is being experienced in the organization.

Furthermore the author noticed that the barriers identified from each interviewee, had a direct relation with the function of the interviewee; e.g. surrounding and stakeholder managers had more insight about the barriers related to the interaction of alliance with the main organizations, while more technical personnel had more focus on backlashes. This remark is logical since each function can experience barriers relating to their own field of activities. However the classification of barriers according to different functions is avoided for two reasons; firstly due to limited number of participants having such classification makes the information provocatively traceable, and secondly since such classification was seen to deliver no added value to this research.

Figure 10 demonstrates the relation between the identified barriers. It should be noted that the relationships between the connecting barriers are causal to some extent but they are not necessary a direct cause and effect relation. Also as it was mentioned, no quantitative conclusion should be made from this research, however the diagram shows percentage of repetition for each barrier to provide a soft indicator of its importance according to the interviewees.

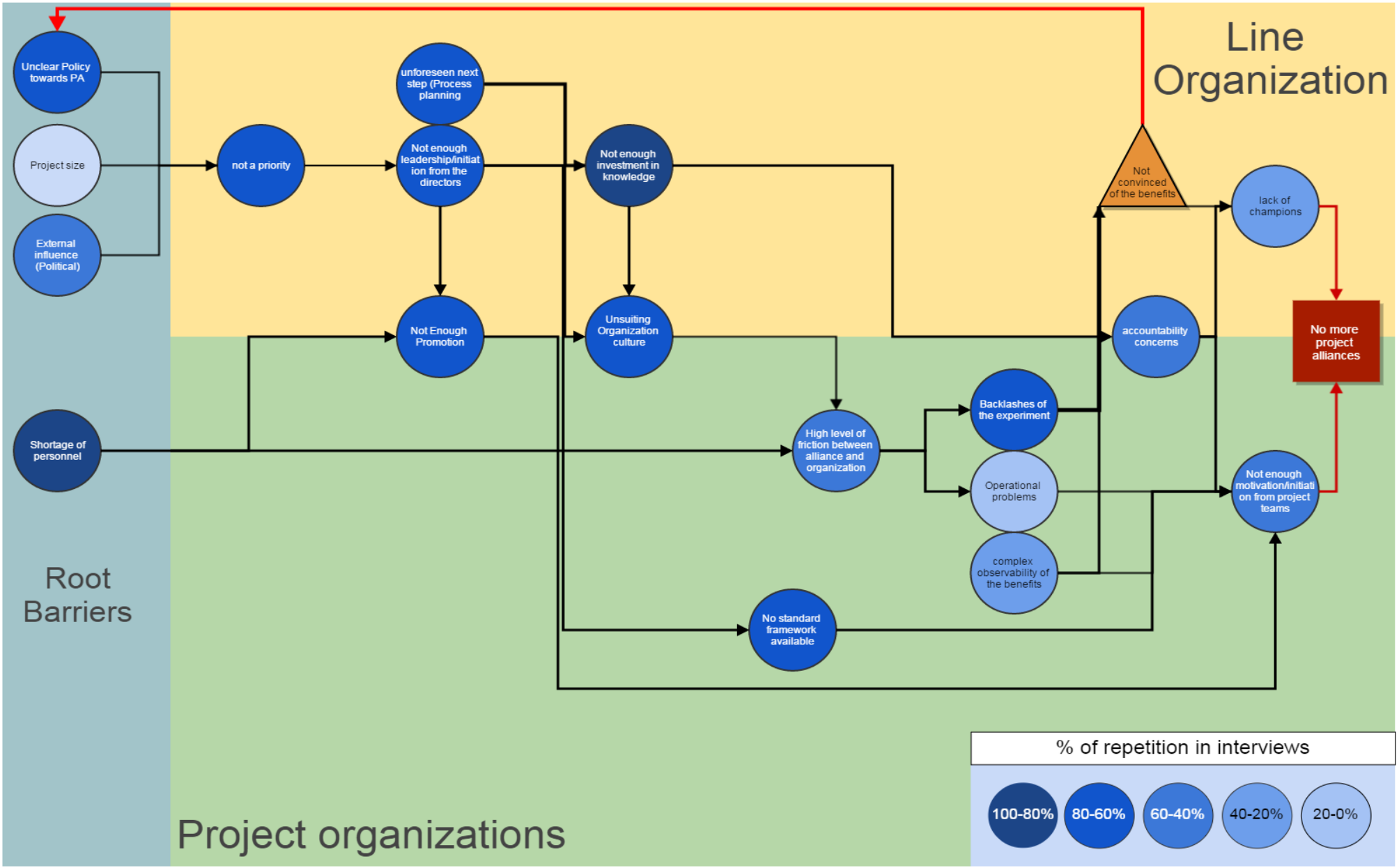


Figure 10 - The barriers schema of group 1 interviews

In total 18 barriers were identified from the interviews of this group. These 18 barriers (which are to be observed from table 2 or figure 10) are explained below.

5.1.1 External influences (Political)

This criterion, concerns the barriers that stem from the influences outside of the Rijkswaterstaat's organization. The reason for including the cluster of external influences in the internal barriers, is that none of the participants knew of the actual influence or effect but presumed it exists, therefore it should be investigated within organization whether this is really the case or not. If this is not the case, then a wrong presumption might be inhibiting the organization from development. If this is the case, the results should be communicated correctly through the organization to avoid wasted resources and dependent on the significance of such influence, the policy should be adjusted.

As the executive agency of the Dutch ministry of infrastructure and environment, Rijkswaterstaat is regulated via different legislations, just like any other public organization. This includes not only accountability regulations but a great deal is due to the financing of the projects.

It is a global struggle to provide the finance of large projects via private cooperation; this also applies to the Netherlands. Furthermore the overarching EU legislations also affect the financing of projects. An example of accountability regulation is that Rijkswaterstaat cannot invest in "high risk" projects or businesses, or that financial wins should not be the purpose of partnership (Comptabiliteitswet). These issues were already explained in the literature review section and seemingly do not pose limitation on adoption of PA.

But the issue of private financing will be discussed by considering statement {Q1} from interviewee #2; the influence of politics on not supporting PA is due to the preference they give to DBFM contracts. And this preference is due to the private financing of projects which is currently only possible by DBFM contracts. According to interviewee #2 the main reason that the private financing is currently considered extremely important for Rijkswaterstaat and public sector in general is the Brussel's budget deficit agreement.

Brussel's budget deficit agreement (European Fiscal Compact):
European fiscal compact, or also known as Treaty on Stability, Coordination and Governance in the Economic and Monetary Union (TSCG), is an intergovernmental treaty that bounds the member states to a balanced budget or surplus under the treaty's definition.
In the Brussel's agreement in 2011, the new fiscal rules reset the macroeconomic convergence criteria established under the 1992 Maastricht Treaty that launched the European Monetary Union (EMU). This obliges the member governments to conform to a budget deficits surpass of maximum 3% of the GDP, or face automatic penalties. This measure has been done as a response to the yet fragile recovery of global financial crisis. (Bartlett 2011)

Despite a record budget deficit of 5.60% of GDP in 2009, with the right measures, the Netherlands seems to be conforming to Brussel's treaty quite good, (tradingeconomics.com retrieved 2014)

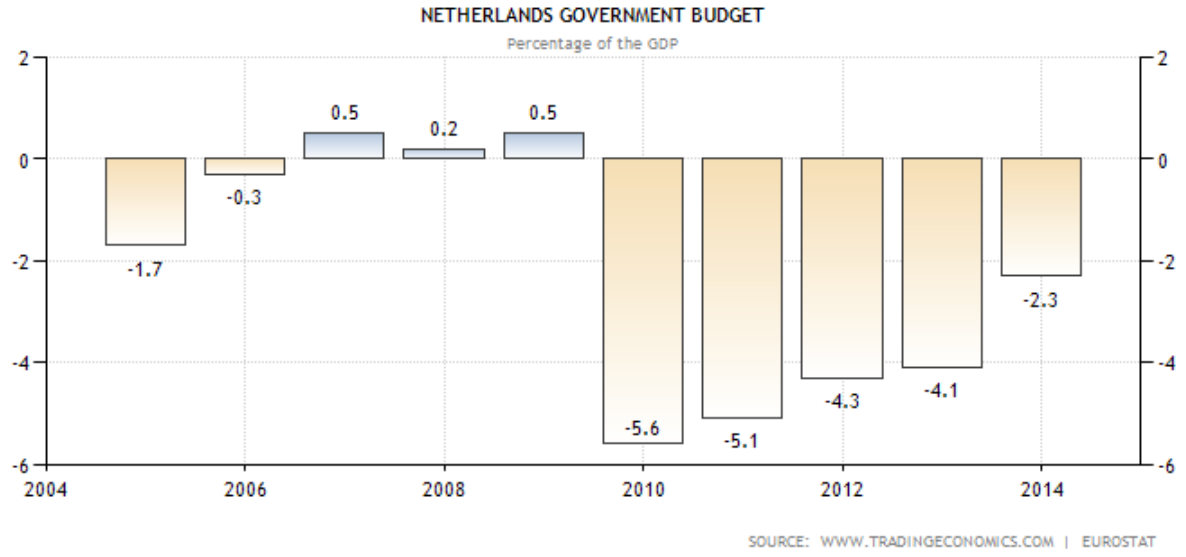


Figure 11 - The Government budget of the Netherlands

Another related issue that makes DBFM and private finance of the projects more attractive for policy makers is the payment for service rather than the project, despite being understandably more expensive, due to higher loan interest rates for private than governmental parties {Q2}. Interviewee #3 finds this the main reason for politics not being in favor of PA.

As a result of heavily being inclined towards DBFM contracts, arguably other contract types receive less chance to be adopted within the organization, even for a fraction of projects. It should be noted that not all the projects require private financing, thus the question is why PA is not being used for projects that are financed by public parties themselves? Something that interviewee #5 saw as a problem of not having enough knowledge {Q3}.

According to interviewee #8, external influences can show themselves in another way as well; the politics do not have to be necessarily against PA to negatively influence the decision of adopting it, rather by not putting pressure on its application, they are gesturing the limited use of it {Q4}.

What can be concluded is that there is no single cause for potential external influences but there could be a mixture of causes. With this in mind, another possibility is what is referred to as 'mere-exposure effect'; a psychological phenomenon by which people tend to develop a preference for things merely because they are familiar with them. (Zajonc 2001) This mere-exposure effect not only can be a direct barrier for anything new by creating a resistance for it but also could cause lack of drive for it, even without there being any resistance.

From the 8 interviewees of this group, 4 found external influences a separate barrier while the rest found it to be just a matter of not knowing.

As a conclusion for this cluster, it should be investigated what exactly are the external influences regarding Rijkswaterstaat and their policy of adopting a new PDM. Since the existence of such external impacts, could be defining for the organization's development of this PDM. But also it is noted that the concern of politicians is not directly about which PDM to be used, but rather the consequences that it can have for them. Thus informing them about the benefits of PA can provide the needed support for it. For the accountability regulations, only one research has been found that

provided insight about the legislative boundaries of PA, and the results of this research show a good flexibility in this regard, even more than the regulations in Australia as it was mentioned in the report (Chao-Duivis, Janssen et al.). Additionally, the author has conducted several meetings with the experts in this field (from Rijkswaterstaat, TU Delft and a private law firm with specialization in the related industry) and the general opinion is that as long as the selection procedure and the arrangements are clearly defined and also the alliance organization is not a legal entity, the accountability regulations impose no limitations. This will be further explained in the cluster of 'accountability concerns'.

Furthermore, as it was already mentioned, private financing is not included in D&C contracts as well, thus considering this issue to be the main barrier for adopting PA as an option seems to be not entirely accurate. But still this can be a good reason for PA not being a priority in the organization.

5.1.2 No clear policy towards PA

Rijkswaterstaat started A2Hooggelegen in the year 2007, however the possibility of using PA for an unspecified project was considered in Rijkswaterstaat since 2005. This year seems to be an important milestone in the policy of the organization within the next years since around the same time the use of DBFM contracts for large projects was being considered. However for DBFM contracts, there was a push from the external parties that stimulated more investment in developing and adopting it, something that was lacked for PA.

Following the years after 2005, it is clear that a path-dependent development formed around DBFM contracts; as more projects were realized via DBFM, more experience and knowledge was created for it, making it the main PDM used in Rijkswaterstaat. Focusing mainly on DBFM contracts would not necessarily cause a barrier for adopting project alliancing, as it should only be used for projects that can truly benefit from it, however if this focus causes little to attention to be given to other contract types, then it would become a barrier. {Q5}

But external push should not be considered to be the only reason why the current policy of Rijkswaterstaat is more directed towards contracting from distance rather than close cooperation with the private parties. Another issue is the policy shift from being a technical to a procuring organization. Such policy not only affects the number of personnel provided for each project (relating to the barrier "shortage of personnel"), which will be explained later, but also means that the risks and responsibilities will be transferred to private parties as much as possible. {Q6}

Transferring of risks and responsibilities is best done via DBFM contracts, where the client pays for the provided service instead of the construction or maintenance of the project. On the other hand in PA, the client and the contractor will share the risks through assuming a joint responsibility. This makes PA against the mainstream of the organization, and DBFM, D&C and performance contracts the norm. {Q7}

One of the reasons that adopting PA is lacking the appropriate policy, can be seen with a more general view; Rijkswaterstaat is trying to have a uniformity in approaching the market, this according to one interviewee means focusing on one PDM. {Q9}

Lack of uniformity in approaching the market has been and still is a critic point for Rijkswaterstaat. As mentioned before, RWS is the executive agency of the ministry of infrastructure and environment, thus different public stakeholders give work orders (projects) to RWS for it to realize via cooperation with the private parties. Having different principals with different demands and approaches has

made RWS to have difficulty with uniformity in approaching the private parties, causing critics from the market. Consequently, recently Rijkswaterstaat has tried to centralized its communication and maintain a uniform approach towards the market parties to overcome this issue. Such measures are implemented in the 2015 business plan of the organization, thus it is a new policy that Rijkswaterstaat is pursuing. However it should be seen if uniformity in approaching the market is truly meant as focusing on one PDM or not. After A2Hooggelegen, project alliancing was included in the 'contracts buffet' of Rijkswaterstaat; that is in theory. But in practice, no more applications for this contract form have yet been observed. What {Q9} refers to is that adopting PA is seen as introducing a new PDM for approaching the market, which is not aligned with the current "hot topic" policy of the organization.

As a result for this cluster, it can be concluded that in the beginning years of the experiment with A2Hooggelegen, the current policy was not formed yet, thus a struggle in choosing the appropriate contract type can be seen. In the years later however, more investment in DBFM contracts was done within the organization, making it the main focus of Rijkswaterstaat. To name an example, not only Public-Private Comparator (PPC), that is being used to assess whether projects should be realized via DBFM or a public reference (such as D&C), is considered to be in favor of DBFM but also you can see the project scope (according to monetary terms) for activating a PPC study is lowered from 112.5 million euros in 2008 to the current 60 million euros. Of course this on itself is not necessary a negative action, but it is an indicator of the policy focus of Rijkswaterstaat. If the outcome of PPC is to choose DBFM contracts, then a Public-Sector Comparator (PSC) will be conducted to get insight about the total costs over the lifecycle of the public version of a project and to assess whether a public-private partnership (which is always DBFM in this case) is indeed more beneficial. However interestingly enough, there was not even a single case where public-sector comparator rejected a DBFM. This is due to the fact that the assessment criteria in PSC are more in favor of DBFM than PPC.

In such circumstances, it appears that the development and adoption of PA is faced with policy vacuum in Rijkswaterstaat (one of the criteria in the literature study section). This barrier also has an overlap with the description of another potential barrier from the literature study called "research deficiencies". Since being insensitive to the decision making needs of directors, could have also caused a policy vacuum for it in the organization. Despite the fact that PA should not be seen as a full replacement for DBFM contracts, adopting a new approach even for a fraction of the projects seems to be facing problems due to the current organizational changes and also what was already referred to as "path-dependent development" of the policy. Therefore it is clear that until adopting such contract forms find an appropriate place in the policy decisions making of the organization, it will not become of great concern of the organization.

5.1.3 Unsuitable project sizes within Rijkswaterstaat

This barrier is identified according to only one of the interviewees, but what should be noted is that the interviewee used the link between project size and the finance required as the argument for this purpose. {Q10}

The interviewee did not claim that Rijkswaterstaat only has very large projects, but stating that having mostly large projects, leaves less attention for contract forms that do not provide private financing of the projects, thus making it a barrier on itself.

On the other hand, none of the other interviewees considered project size relevant in the case of Rijkswaterstaat, since there are at any given moment a large variant of project sizes. But what all the interviewees agreed upon was that the project scope should be considerable to provide room for

improvement in the alliance. Otherwise, the potential benefits can be outdone by the challenges of setting up a virtual organization.

5.1.4 Shortage of personnel

This cluster concerns the barriers that are related to the availability of human resources in the organization, whether before, during or after the experiment.

In principle, public and private parties each make up 50% of the alliance organization. However in none of the project alliances in the Netherlands, there was a balance between the numbers of the personnel. It is however noticeable that in all the alliance management teams, the balance was present, however on the lower levels there was a significant misbalance of around 15% of Rijkswaterstaat's personnel vs. the 85% of the private parties. {Q11}

As interview #1 points out in {Q12}, one reason for such misbalance in the number of personnel provided by the public party, can be due to having the mentality of conventional contracting, that public parties are only responsible for the supervision of the work and will not perform other activities within the alliance, thus the same role as conventional contracting.

Including the public parties in the alliance organization of PA, is not for supervision purposes but rather is for their contribution to the actual work. Therefore there should be enough personnel to deliver that work. The "supervision" in this case falls under the responsibility of the alliance board team. On the other hand as mentioned before, due to policy changes Rijkswaterstaat has become a procuring organization. And their field of expertise and knowledge is reduced. Thus involvement in the projects for contribution to the 'actual' work, is mostly restricted to stakeholder and surrounding management domain {Q13}. This is also acknowledged by another interviewee but with further claims that more positions within the expertise domain of Rijkswaterstaat were available that could have been filled with public personnel. {Q14}

This misbalance can also be due to the public sector cutbacks in the recent years that has caused a considerable drop in the number of personnel within all the public organizations as well as Rijkswaterstaat, thus not being able to provide for the projects {Q15}.

Another issue that interview #5 refers to is that recruiting people from the organization to alliance was a difficult task, since people did not have enough information about PA. Therefore promoting the pilot project within the organization in order to find people who are interested to work on it was a challenge as well.

As it is considered by most of the interviewees that PA requires more personnel than the currently adopted PDM's in Rijkswaterstaat, shortage of personnel is considered a direct barrier. However having a misbalance in the alliance organization has secondary effects as well, that were also the case in A2Hooggelegen; due to a low number of Rijkswaterstaat's personnel in the alliance organization, and the main organization saw it as an entirely external party, not a party representing them. This issue will later be explained in the cluster "High level of friction between the alliance and the main organization". {Q16}

But another important secondary effect is that due to lowered number of personnel, and yet the same amount of work load, there is less resource available for experimenting and innovating. The main focus has been doing the duties through already proven concepts and business as usual. Coinciding reorganizations with developing a process innovation has had a negative effect on the resources available for this purpose.

Governmental cutbacks have definitely inhibited Rijkswaterstaat in some aspects regarding PA, it should however be noted that adopting PA in Rijkswaterstaat most probably means using it for realization of a small fraction of the projects, or sub-projects. The eligible projects for this purpose standout among the others due to their complexity and necessity of innovation. And it seems only reasonable to provide more staff for such projects than the usual 5-6 personnel, even if they are being realized via conventional contracting. Additionally, since only very limited number of the projects will be realized via PA, providing more personnel for them, even if they are hired-in staff, also appears feasible.

In the first instance, shortage of personnel might seem to be a very small barrier for adopting PA within Rijkswaterstaat (or any other public organization), but the secondary effects that it brings are far more significant than initially considered. The fact that all the interviewees agreed on this barrier shows its importance. However the secondary effects will be explained in the concerning clusters of barriers; high level of friction between the alliance and main organization and not enough promotion of the concept.

5.1.5 PA is not a priority of Rijkswaterstaat

The construction of A2Hooggelegen project started in 2007, after more than 7 years it appears that the priority level in adopting PA has been decreasing over this timespan. Several issues could have influenced this decreasing attention, but it can confidently be said that the most important factors are stemming from the two clusters of “no clear policy towards PA” and “external influences”. The effects can be clearly observed from the description of aforementioned barriers. However to clarify, the reason that shortage of personnel, despite reasonably having a degree of connection to not being a priority (due to what was already mentioned; focusing on fulfilment of duties rather than giving attention to experiments and innovation), was not connected to this cluster is that such relation can be justified through the connection of external influences and policy of Rijkswaterstaat.

Therefore it can be argued that due to the external influences that also have effect on the policy of Rijkswaterstaat, the attention level for PA has been decreased over the past number of years. Too many changes in the policy and organization can be seen as a main reason for this barrier. As an example, developing DBFM contracts within the past 10 years can be seen as one of the changes in the policy that diverted the attention away from PA. {Q17, Q18, Q19}

Not being a priority is itself an effect of the previously mentioned barriers, but has a direct connection with the barrier “not enough initiation/leadership from the directors”, which will later be explained.

5.1.6 Unforeseen next step of the experiment (process planning)

When the experiment of A2Hooggelegen was conducted, it appears to be unclear whether the next step of the experiment was already planned or not. It is logical that for such a large scale experiment, at least two black and white scenarios of achieving successful results or failure should have been considered. And then what would be the next step in each of these scenarios. If the failure was significant, PA could have been crossed off the organization’s agenda, at least for now. But if it was successful, it is logical to continue with the next step of the experiment. What can be observed is that despite claims of being a successful project (not only public announcements but also from the evaluation reports), no next step was implemented {Q20}. Despite being only about the planning and not technical aspects of PA, this barrier is related to one of the barriers found in the literature study section, improper planning.

A good next step could have been opting for more experiences via appointing another pilot project in order to ensure enough investment in the knowledge of the organization in this regard {Q21}.

If the evaluations of the experiment were negative, it would have been easy to explain the stoppage of PA, however as mentioned before, due to the positive reviews and still no next step, the dilemma arises whether there was a well thought out plan to begin with or not.

5.1.7 Not enough initiation/leadership from the directors of line organization

It is clear that if an issue is not high on agenda, less commitment to it or perseverance will be resulted. The desire to achieve something provides perseverance for it. And as adopting any new process within an organization, commitment is an important success factor. This can also be seen from appendix 3. Thus it is important that if there is/was a tendency for adopting PA in the organization, as it can be seen from starting a pilot project for it, it would not be realized until there is enough perseverance for it. As mentioned before, an organization is a complex network of people, working towards the same goal. By definition it is expected from the directors and leaders to lead the way towards the goal. And therefore the commitment of an organization starts with the commitment of its leaders. A leader can start a movement towards a goal but if there is not enough perseverance for it, this movement will not have large scale effect. {Q22, Q23}

As it was mentioned earlier in this thesis, in the experiment phase the decision for using PA has to be top-down (it cannot be expected for this decision in the experiment phase to be bottom-up since that is one of the indicators of reaching the adoption phase). The main reason for this is that the lack of knowledge about it will cause resistance for it. Such knowledge can partly be achieved through theoretical aspects but the great deal is dependent on practical knowledge, thus experiences. Therefore the following loop will be resulted.

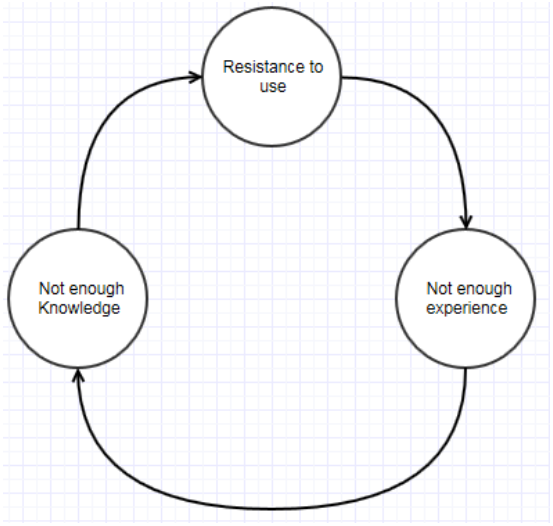


Figure 12 - The resistance loop

Consequently to escape from this loop, it is important to increase the knowledge, via achieving more experiences and this can only be done with perseverance of the leaders. This relationship will be explained later in the barrier “not enough investment in the knowledge”. But it should be noted that such dilemma was also observed in adopting other contract forms such as D&C (vs. traditional contracts – RAW in the Netherlands) and DBFM (vs. D&C).

As interviewee #8 suggests, assigning more projects to be implemented via PA is one of the three main steps of adopting PA that is expected from the directors, right after initiation of experimenting and providing support by leading the way and putting in resources where necessary.

Initiation of experiment has occurred by A2Hooggelegen, providing support and leading the way was arguably also done to a satisfactory level. But the third step, assigning more projects is yet to be implemented.

As a result of this barrier, not only the experience level will not be increased in the organization, but also the project teams and other personnel in the organization will find it unnecessary to pursue PA, due to lack of initiation of their influencers. This could lead to the problem of miscommunication and mixed-signal between the directors and the project teams. On one hand, PA is mentioned in the "contracts buffet", the experiment was initiated and no official stop order was communicated to the project teams with regard to PA, on the other hand no more initiation is being taken for its progress; consequently putting PA in a freeze state. Initiation from the directors will not only increase the know-how of the process in the organization but will also align the different departments of the organization, such as back-offices, project teams and etc. in pursuing the adoption of PA. For example the effects can be on the culture of the organization and development of the right frameworks and procedures, thus acting as a promotion of the concept on itself. This barrier is related to the literature study barrier of "not enough initiative".

5.1.8 Not enough promotion for PA

For a new idea to be accepted within an organization it is important for it to be fairly promoted, otherwise the importance of adopting that idea will be lost between the people. It was already mentioned in the last barrier that not enough initiation from the directors resulted in less attention to be given to PA. Another side effect of that barrier is the fact that after the experiment, the concept of project alliancing was not promoted enough through the organization {Q24}. This in itself can cause lack of motivation for trying the new concept.

However the question is whether this promotion should be done by the directors or the project teams who had first-hand experience with PA? The simple answer is by both! Since the burden for this purpose is quite heavy and needs participation of people in different levels of the organization, from the project teams to the directors.

Of course not everyone, or even the majority of people in the organization are expected to promote the concept of PA, otherwise there would not even be the need for it. But it appears that a number of people on different management levels within the organization do believe in the benefits of PA and these people could be the ambassadors of this relatively new concept for it to be implemented. Additionally to this approach, as it can be understood from {Q25} by involving the key functions within the different decisive departments for the adoption of PA in the organization, the task of promotion can be done wisely.

However what appeared to be the problem of promotion during the A2Hooggelegen experiment {Q27}, was the fact that shortage of personnel in the project and relatively more responsibilities than other contracting forms, resulted in very limited additional time and energy of the project team to be available for the promotion of PA. The main responsibility of project team is to deliver the project as anticipated, thus in this instance, in an ideal situation, promotion of PA comes in the second place. {Q26}

Furthermore, for effective promotion, it is important that it happens from different levels. If only project team promotes the concept by endorsing their own project, it will of course not strike others as fully honest. However if the promotion is done by the directors, back-offices and other functions within the organization and examples of the promoted concepts are given by the project team, then it could be much more effective.

5.1.9 Not enough investment in the knowledge of the organization

It is only logical for a new process to be implemented, that enough investment has been done in increasing the knowledge about it. Understandably, the more complex the concept, the more investment it requires to raise the knowledge level for it. The concept of PA on itself might not be that complicated, but considering the traditional industry of construction and decades of working with traditional and conventional contracts, shift to a dynamic contract that ignores some of the previous boundaries would make it troubling to be fully comprehended in haste. This barrier is linked to a potential barrier found in the literature review, lack of knowledge and skills.

Another issue contributing to this, as mentioned in the literature study section, is the fact that PA is a container word with many different interpretations about what it is and what it's not. This matter is quite noticeable comparing the definitions that the interviewees in this research provided for PA and has a direct relation with the functions of the people within the project; for example, people with contract related or technical functions provided definitions with emphasize on the hard sides, and people with relationship related functions, provided definitions that emphasized the soft sides of PA. As it can be observed, there was a disagreement between what defines project alliancing. {Q28, Q29, Q30, Q31, Q32}

From statements {Q30}, {Q31} and {Q32} the confusion of people within the organization seems to be whether project alliancing is an independent PDM or similar to partnering is a set of principles that can be applied to other PDM's. Or even whether it is a hard mechanism that could also be used in other PDM's.

As interviewee #1 mentions, initially the idea of creating an independent company was considered for the project alliancing {Q33}. However this act, essentially would convert PA, to a joint-venture contract that is valid for the duration of the project, therefore redundant in the sense that one of the reasons of using PA is the opportunity of not having to set up a legal entity for the project organization, as this can be a problem concerning accountability and equality with regard to the partnership of public and private sector and complicates the setup procedure.

As it was already mentioned in the literature study section of this research, it is impossible to have only one definition for project alliancing, thus all of the definitions above can be correct, at least to some extent. However in order to adopt PA in a large organization, it is important to standardize the concept, even if this is done with a degree of flexibility. Consequently, a common definition is required for it on a more general level. A definition that helps avoid confusions as mentioned before, but also provides enough room for project team's interpretation to make it tailor-made for their project. Another benefit of having this working definition is to make a distinction between PA and other similar concepts.

This barrier is not only limited to a common definition for PA, but more importantly, it is about lack of general knowledge of PA in the organization. This barrier is one of the most mentioned ones (8 out of 8 interviewees) in the interviews. The majority of the interviewees (5 out of 8) even used the same proverb with regard to this barrier: "Onbekend maakt onbemind" which can be translated to:

unknown makes unloved. Referring to the fact that if people don't know what project alliancing is, they will not be using it. Not knowing is also associated with the fear of uncertainty. {Q34}

Since there was only one experience with regard to PA, the knowledge on all levels of the organization is still far from enough, thus this is not just the case for project teams, but is also true for the back-offices. {Q35}

As interviewee #1 pointed out, having practical experience is necessary for acquiring the required knowledge {Q35}. However this provides a dilemma related to the number of personnel involved in each project; due to very limited number of people involved in the projects, as it was the case for A2Hooggelegen, it would take numerous projects for the hand-on experience to be acquired by a reasonable number of people. On the other hand, in PA, the relationship between the people is being built throughout the duration of the project and changing the people in the anticipation of acquiring more first-hand experiences from one project will have significant negative effects for the project.

Thus it is understandable that the spread of knowledge will have a relatively slow pace. Especially if only a fraction of projects would be realized via PA. For example, in Rijkswaterstaat, there is only 1 project manager that has the experience of being an alliance manager in PA. This is also the case for other functions within the alliance organization such as the stakeholder manager and etc. Therefore as an example, in a project of 5-6 years, only one personnel from the organization would acquire the experience of being the alliance manager. Interviewee #1 suggests creating a special unit for PA; a limited number of people who are the experts in PA, just as is the case for any other competencies in the organization. {Q36}

On the other hand, another interviewee has a different opinion with regard to educating the personnel about different aspects of PA; stating that the organization is inhibited by wanting to know everything beforehand, and thus a sense of security. However people can be educated about the general knowledge required for PA, and the details of know-how can be learned in practice. {Q37}

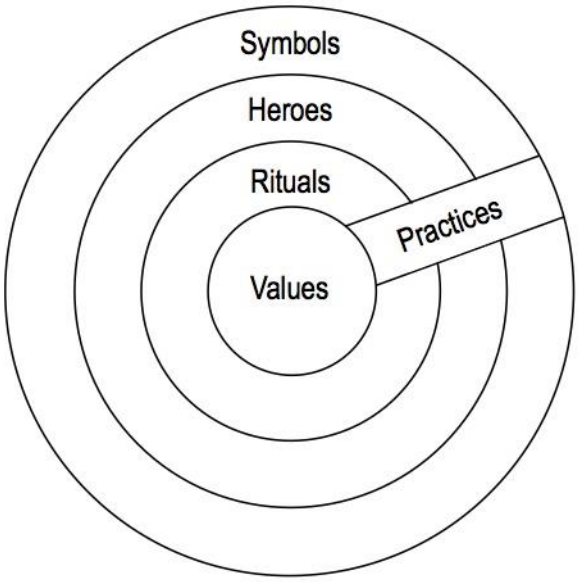
It can be argued that the majority of required knowledge for PA, is about the process and how it works. This includes the intra- and inter-organization relationship of people. This process not only can be affected by the culture of the organizations but in the long run can also influence the culture. Adopting PA will not work with the traditional mentality and culture, which is based on control (vs. trust). Such mentality, even if it is only overarching the interaction of main organizations with the alliance team (and not in the alliance team itself) would still bring about a lot of problems {Q38} which will be discussed in the barrier "high level of friction between the alliance and main organization".

It can be concluded that a common view on what defines project alliancing is necessary in adopting it, as it will provide a more clear concept for people to refer to. On the other hand, having different views on what PA is, can cause many different perceptions about it to be developed in an organization. Such different perceptions would be beneficial if they are all based on the right knowledge foundation, thus leading to a "survival of the fittest" phenomenon in the variants that will be developed due to difference in perception. But if the perceptions are based on the wrong foundation, it could lead the development of knowledge in the concerned field to a wrong direction. Having a working definition, as it was provided in the literature study section, can be useful in ensuring that the correct foundation is set, and variants can develop on that.

For PA as a new PDM, the required knowledge is about the process, how it is supposed to be carried out and developing the right mentality for it in the organization. Therefore there is a clear link to the barrier “not suiting organizational culture”.

5.1.10 Not suiting organizational culture

As it was several times in the literature review section emphasized on, PA is not just a new process, it is also a new mentality that is only possible with a change in the current construction culture. The shift from transactional (control) to relationship (trust) culture, is currently one of the major challenges for the adoption of PA. For decades, parties in the construction industry have focused on the transactional contracting, developing a control culture within their organization. Changing this culture to a trust-based one, would not be an easy task and requires lots of investment and time. The difficulty is in the multi-layered nature of culture, as suggested by the cultural onion of Hofstede:



Hofstede, 1991.

Figure 13 - The cultural onion model

Culture is referred to as collective programming of the human mind that distinguishes one group or category of people from another. (Hofstede, Hofstede et al. 2010)

Comparing to a nation, organizational culture has significantly less diversity and is less complicated to study. Another interesting finding of Hofstede is that the cultural difference in the organizations located in the same nations are identified on the level of practices, but for different nations is rather identified on the level of values. The deeper we go in the onion model, the more difficult it is to change it. In an organization, there are three different aspects that define the culture; how members of an organization relate:

1- To each other
2- To their work
3- To the outside world

For properly adopting PA, all these three aspects need to be affected. Additionally, as it was mentioned in the literature study section, in a larger picture a greater change in mind-set and values can occur with the use of PA. That change affects the most inner circle, values, as it will bring more attention to the process and relation of parties than the hard values.

For further information it is advised to refer to the book by Hofstede, Hofstede et al. (2010) as discussing the organizational culture can be extremely lengthy and is out of the scope of this thesis. But what is important is that a significant change in the organizational culture is necessary in order to adopt PA. And such changes can be easy for what concerns the symbols, and much more difficult for what concerns the values.

Adopting a new process, such as PA, requires a relatively large scale change in the culture of an organization, not only due to the differences it has with regard to cultural requirements to its preceding processes but also due to the number of people affected by adopting it. What interviewee #1 has noticed, is the lack of proper mind-set in the "practices" level of the culture and not comprehending such close partnership with the private parties {Q39}. This mind-set is the result of many years of 'contracting from distance', that has created a 'control' mentality in the organization. And due to the unanimous decision making and elimination of power distance in PA, it is seen to be against the strict control that the organization is used to. The right mentality for PA requires a trusting culture rather than a controlling one {Q40, Q41, Q42, Q43}.

As explained in the literature review section, having a controlling mentality could cause some significant problems due to the complexity of the projects and the need for closer cooperation, but on the other hand, leaving this mentality seems to be difficult and fearful for the organization. {Q44}
On the other hand, interviewee #3 believes the current "controlling" mentality is not due to the contract types but is due to misunderstanding of the partners with regard to each other {Q45}. Thus the trusting culture is independent of the contract type but rather a result of mutual understanding. For this culture to be developed, people need to focus more on the process rather than the contract {Q46}. However it is also acknowledged by the same interviewee that DBFM and D&C contracts are more challenging for developing such culture {Q47}.

Despite this research being focused on the public organizations, the interviewees also emphasized on the fact the private parties are also still lacking the appropriate culture and mentality towards PA {Q48, Q49}.

To sum up, it is clear that the dominant culture in the organization is of controlling rather than trusting. This culture that has been developed throughout the years is of course very difficult to influence and requires a lot of investment. Furthermore, it should be emphasized that "control" culture is not limited to Rijkswaterstaat but as mentioned in the literature review section, it is the dominant culture in the industry, internationally. As it was also mentioned in the literature review section, PA provides the foundation (right arrangements and agreements) for a more trusting culture to be developed but also requires a minimum level of trust to begin with. Otherwise it is destined to fail. But interestingly enough, it appears that the project team in the alliance organization had developed the optimum culture for PA and no noticeable barrier was seen in that regard, but the barriers were seen in the interaction of the alliance organization with the main organizations of both public and private side. This issue will be explained thoroughly in the barrier "high level of friction between the alliance and the main organization".

5.1.11 High level of friction between the alliance and the main organization

As it was already explained, in project alliancing, a virtual organization is formed that carries some of the responsibilities of both principal and agent with regard to the project. This process can be visualized and compared to conventional contracts in figure 7.

Therefore in PA, instead of a bold interface between the client and the contractor, two smaller interfaces are created by means of a virtual organization. In principle, the interactions via the two

smaller interfaces are much smoother than the interactions via one bold interface. However according to half of the interviewees (4 out of 8) in practice, it appears that managing the two newly formed interfaces due to the alliance was not done optimally. Formal interactions regarding the change procedures and financial arrangements supposedly occur via the alliance board team. But it appears that the involvement of ABT in A2Hooggelegen was only for monthly evaluation and eventual issues that required agreement between the parties. Other interactions with regard to the details of the project occurred directly between the alliance organization and the main organizations. And this is where most of the friction was felt. As it is experienced by the interviewees, the alliance team was not able to attain enough trust from the main organization and thus their arrangements were not respected enough {Q50, Q51, Q52, Q54}. This distrust is considered to be due to looking at the alliance organization via traditional glasses {Q50}, having insufficient representatives in the alliance organization {Q51} and being focused on the alliance team too much rather than ensuring a sound relation with the main organization {Q52}. These together have caused such distance between the alliance and the main organization that according to one of the interviewees, the alliance organization was considered an independent party and not a party that is representing Rijkswaterstaat {Q53}.

It can be argued that a moderate level of friction can be beneficial for the relationship between the virtual and main organizations. However if the friction level escalates more, then the flexibility of the virtual organization will be vanished in their interaction with the main organizations. The primary idea for PA, is to provide a sense of flexibility in the arrangements between the parties, and if due to the aforementioned friction, this flexibility vanishes, the benefits of project alliancing will not be achieved.

High friction and disagreements causes the project organization to be constantly dependent on the main organizations, consequently forming three parties for what was envisioned to be done single handedly in the alliance {Q55}.

As a result, a mentality of two different parties was created between the people of Rijkswaterstaat, working in the alliance and working in the main organization that had interaction with the alliance {Q56}.

There are several attention points from the aforementioned discussions:

1. Having a relatively low number of representatives in the alliance organizations would lead to more friction as that party might sense its lack of proper representation. Consequently less trust will be given to the project organization.

2. Creating an optimal relation between the alliance organization and the main organization, should be done mutually from the personnel in either one. However project teams are more concerned with achieving the project goals and milestones as they are expected to and having a limited number of personnel enforces them to spend even less attention for creating that trust.

3. Even though this is not a direct barrier for adopting PA, it can be seen as an indirect cause, affecting both the directors and the project organizations to not initiate PA.

4. Project alliancing was used to dispose the “we and them” mentality between the client and the contractor. However the aforementioned friction has caused this mentality to be created between the alliance organization and the main organizations. On the other hand, it appears

that the relationship between the parties in the alliance organization encountered no problem. But rather the interfaces as illustrated in figure 7 seem to be where the problem laid in A2Hooggelegen project.

5. Interestingly, the 4 interviewees who recognized this barrier were all members of the alliance team, and the other 4 interviewees who did not recognize this barrier were either from the alliance leadership team or the project personnel of Rijkswaterstaat working within the main organization. Considering that this barrier refers to the interaction of personnel from the alliance team and the main organization, and seeing the distinct difference of perceptions between the two sets, it is theorized that this barrier is closely related to the culture; the people within the alliance team from both public and private parties were selected on the basis of having the required mentality and being able to work together in such a close partnership and have developed a trust culture between themselves, however this culture is not yet developed within the main organization thus a conflict of attitude is created.

5.1.12 Backlashes of the experiment

This cluster of barriers is linked to the potential barrier identified in the literature review section. As it was already mentioned, occurrence of backlashes in applying a new innovation, can cause wide spread lack of acceptance, support and commitment towards it.

A2Hooggelegen as an experiment, despite being generally considered a success, had both positive and negative aspects. Some of these aspects are covered in the evaluation report and the book containing the experiences (Doorn, Blok et al. 2008; Bloemendaal and Geest 2011), however some other might have been missed out since they very concern specific issues.

For gaining support for the experience, a strategic move was to emphasize on the potential financial benefits that it could deliver, as this matter is quantifiable, thus easily observable. Therefore one of the main factors that the idea of the experiment was sold to the organization upon, was not only the avoidance of cost overrun but also the fact that at the end of the alliance, some of the project budget might be left in the mutual fund and thus divided between the parties. However at the end, many different opinions about the financial success of the project aroused. The budget used for the project, at the end came close to double of initial amount allocated for it, however as claimed in the book (Bloemendaal and Geest 2011), scope changes and increase cause the majority of the project cost escalation. Anticipating many scope changes is seen as a driver for choosing PA due to the flexibility that it provides in the partnership and change orders. But ironically, this caused the project to be seen as a financial failure. Furthermore, if the expectation from the project was to achieve a positive financial balance and the balance ended up on zero, the project would still encounter negative reviews from the people {Q57}.

Therefore not living up to the expectations can be seen as a backlash. Promoting PA was definitely necessary before the experiment but it should have been made clear that as an experiment, it is logical that not everything goes completely as anticipated.

Another issue that can be regarded as a backlash of the experiment was the financial discussions that occurred in the course of the project. For almost one and a year after the contract, it was still not clear to the parties who was expected to provide for the risk fund; the parties arguing whether it is a mutual pot or a bonus pot. These discussions were finally solved but caused a long-lasting discussions due to the lack of clarity in the arrangements {Q58}.

Another example of the backlashes with regard to the financial arrangements was the slow following of the financial arrangements comparing to the work being done. This issue is considered to be due to the slow process of approving the financial decisions of the alliance team by the main organization {Q59}. To avoid these sort problems, more attention should have been given to the process before implementing the alliance. Having the "best for project attitude", means that the alliance does what is important for the progress of the project even before the financial deals are cleared. But on the other hand, either measures need to be taken to increase the pace that such procedures follow, or ensure the contractor understands how much time such procedures might take, therefore avoiding an insecurity from the either side.

Another attention point is the division of tasks, as mentioned by two of the interviewees, #4 and #7; this division of tasks was not clear enough in the beginning. Despite having a joint-responsibility in the alliance, both parties outside the alliance are expected to have clear understanding about their responsibilities, which seemed a bit troubling in the beginning of the project. There are also examples of technical backlashes, which might have caused the benefits of PA to be questioned; for example an issue concerning the life-cycle considerations of the project {Q60}. This is also an important backlash since one of the main selling points of PA, is that it provides better life-cycle consideration by involving the key parties as early as possible in the process. However occurrence of such problems can be seen as a contradiction to the expected benefits.

Despite the aforementioned backlashes it is important to mention that an experiment in this scale and nature is expected to show some difficulties and mentioning these issues should not be seen as the failure of the project, as the project scored very high on the predefined KPI's. But rather the attention here is towards the impacts on the concept of PA within the organization.

The reason such issues were mentioned as backlashes and not operational problems or any other title, is that they could have been avoided if more attention were given to them before or during the project.

Such incidences could cause the organization, and especially the directors who oversee the results of the experiment, not to be convinced of the potential benefits of PA, thus not seeing adopting it as a priority or becoming a champion for its promotion in the organization, making backlashes of the experiment an indirect barrier.

5.1.13 Operational problems

The main difference between the barriers in the "operational problems" cluster and "backlashes of the experiment" cluster is that the former could have not been avoided during the experiment due to the fact that they concern the limitations of PA, organizations or governing legislations. Thus such difficulties will probably also exist for the next project alliances by Rijkswaterstaat. On the one hand, identifying them in the pilot project can be seen as a learning point of the experiment that contributes positively to the next experiences but on the other hand, if these problems are seen significant and unsolvable, then it is logical that the decision to adopt PA would face more challenges. It depends on the perception of the people for an issue to be considered a noteworthy problem, or just an ordinary occurrence that can happen in every project. To have a more focused view and relevance to the research, the issues brought here are directly concerned with the choice of using PA as the PDM. In other words it can be said, that if other PDMs were used, these issues might have not been observed. On the other hand, this does not say anything about the relative advantages/disadvantages of different PDMs with regard to PA.

One of the most mentioned difficulties of forming an alliance is considered to be the selection procedure for the right partner. In A2Hooggelegen, competitive dialogues based on MEAT criteria were chosen to perform this task. The details of the selection procedure for this project was mentioned in the literature review section, however one important aspect was the focus on soft skills in the selection of partner, which is a relatively new effort in the Dutch construction industry. For example, the results of a workshop were considered as a criterion with 25% weight in the second phase of competitive dialogue. According to the evaluation report of the tendering procedure, a number of the bidders found the subjective evaluation not clear enough and were not happy with the results. Additionally, implementing subjective evaluation, which is considered significantly important according to the literature review section, might make the selection procedure more complicated for the procuring party. In response to whether this dilemma existed in the experiment, interviewee #1 states that the contractor selection procedure in the experiment was unordinary but not complex {Q61}.

Other interviewees also did not mention any operational problems during the partner selection procedure. However some other interesting issues were raised during the interviews; **(a)** not being able to use the facilities of Rijkswaterstaat for the alliance organization due to the accountability issues {Q62}, **(b)** not being able to integrate networks with the private parties {Q63}, **(c)** not being assured that of the contractor's honesty in the potential discounts they could have got from the subcontractors {Q64} and **(d)** the fact that the payments should be done via Rijkswaterstaat since the alliance organization was not a legal entity {Q65}. These issues will be explained separately below.

(a) Due to the accountability concerns, it is not possible for the public entities to allow private parties work in their facilities, as confidential information could leak and result in the violation of the equality principle.

(b) One of the difficulties faced during the initial phases of forming the alliance, was the network and staff integration. It is logical that an integrated project team should be working together also integration was one of the important elements of PA. It is also logical that for the people who are coming from different organizations, in order to provide the best for the project, they need to have access to the networks of their main organization. Otherwise being isolated from the information and communication network of your organization could provide difficulty with bringing in the resources to the alliance. However according to the regulations of Rijkswaterstaat, it is not possible to have private parties accessing their network, thus an integrated network in the alliance between the public and private parties was not feasible. This measure is logical and can be the case for many public organizations in different countries. Therefore despite measurements to limit the access of the private party's personnel in the alliance teams to the public party's network, it would still be considered a violation of regulations.

(c) This issue shows that there are still some loopholes in the arrangements that if parties are not acting according to the principles of PA, could take advantage of. However another important issue arising from this, is the negative effect that even doubts about such issues could bring to the relationship between the parties. Therefore whether such hidden agendas are occurring or not, if the suspicion is there, it could be damaging to the trust between the parties.

(d) It was already mentioned that in PA, the alliance organization is a virtual entity. Therefore any financial deals and arrangements should be implemented via the main organizations. For example for a scope change, it would officially go from the alliance organization to the

contractor, to the client and then to the external stakeholders. This issue proved to be difficult in A2Hooggelegen according to interviewees #1, #5 and #7. Having such authorization process, on the one hand ensures that parties agree on important issues, but on the other hand, the extra bureaucracy will limit the flexibility of the alliance team, especially in the projects that anticipate lots of change orders.

5.1.14 Complex observability of the advantages of PA

As it was mentioned in the literature review section, high observability of the results of an innovation, is one of the factors that makes it to be diffused or adopted faster. Therefore complex or low observability could have the opposite effect.

In A2Hooggelegen there were concerns with regard to the surrounding and stakeholder complexity of the project, the tight schedule and the traffic control issue from the beginning. Therefore these issues provided the required motives to have this project as the pilot project of PA.

In the construction industry, the successes of a project have long been assessed according to the project management triangle, cost, time and quality. Between these three, despite quality being considered the most important, cost and time have higher observability due to the objective nature of them and are easier to compare between different projects. Additionally, each project can have its own specific KPI's that the success of the project will be assessed according to them. For A2Hooggelegen the following KPI's were defined:

- Time
- Budget
- Quality
- Safety
- Image of the project
- Traffic hindrance

Some outstanding performances in these KPI's have been achieved, as brought in the book (Bloemendaal and Geest 2011). These achievements can be seen as a consequence of the processes in the project and alliance. In other words, the soft benefits of PA such as providing flexibility for the change orders {Q66}, creating a transparent partnership based on trust, pooling the knowledge and expertise of both parties in the project and etc., can be seen as contributing factors for this achievement. However according to some of the interviewees, some of the people not involved in the alliance did not see this relation between the advantages of PA and the hard results. If this relationship between the advantages of PA and the results of the project were more observable, it would have provided the other project teams more motivation to use PA, however complex observability makes this difficult to happen {Q67, Q68, Q69}. Thus the connection between the soft factors and hard results, is yet to be proved and it appears that the observability of this connection is still not high enough for the people in the industry to truly be convinced.

However as interviewee #5 puts it, not being measurable or avoiding the problems in the first place, instead of solving them after they show themselves, can also cause problems with the observability of the benefits {Q70}.

Therefore as it is explained by interviewee #5, the project team tried to show the positive results by first emphasizing on the measurable results then bringing the attention to the process of achieving such results {Q71}. Yet it is the question whether this approached has been effective in making the

benefits observable for the people. Furthermore convincing people of the benefits just by one successful example will not be sufficient, *"One swallow doesn't make a summer!"* {Q72}.

PA focuses on the processes that contribute positively to the end result. Despite people not denying the link between the benefits of PA and better performance in the hard criteria, the observability is not clear enough. This problem is due to the fact that every project is different and therefore there is no possibility to directly compare the results of the same projects, one implemented via PA and the other via other contracting options. Thus proving the connection between the soft skill benefits and hard results is difficult. If such link is not proven for the project teams, they will not be motivated enough to spend energy on developing such soft factors. For example in A2Hooggelegen, despite the fact that the project was completed on budget, there is no possibility to prove this would have been more expensive if realized via another contract form. As also some of the critics still argue that finishing on budget was due to the high budget allocated for it.

5.1.15 No Standard Framework available for PA

This cluster of barriers focuses on what concerns the lack of standardization of PA processes, whether for the assessment of appropriate projects or the drawing of the contract (reference contracts). In large organizations, processes are mostly standardized and naturally deviating from that standard process requires more effort than complying to it. For A2Hooggelegen, since it was an experiment, such deviation occurred. For example in the procurement, as already mentioned there is a PPC that assesses the projects for their suitability to be realized whether via DBFM or D&C contracts. However for A2Hooggelegen, a new option was chosen which before has never been implemented within the organization. In case of experiments, such "unstandardized" measures need to be taken. However for adopting PA, a systematic approach is required to ensure such consideration happens somewhere in the process, independently of the people concerned with it. This has also been the case for other contract types currently adopted in Rijkswaterstaat {Q73}.

On the other hand, the lack of a consideration for PA in the standard process, is perceived as a barrier that only project teams with very high ambition might overcome; since this requires going a step further than the expected norm {Q74}.

Furthermore, for an unstandardized concept to be implemented in a large organization, since the mandates for its implementation are missing {Q77}, many authorizations are required. Such authorizations not only require a lot of effort to attain but will also be very time consuming. Adding to this the time schedule of the projects, such lengthy procedures can be seen as a great discouragement, not to mention the extra work that is enforced to the project personnel {Q75}.

For the assessment of projects (to consider whether they could benefit from PA or not), a project alliancing assessment framework (Afweegkader projectallianties) has been developed in Rijkswaterstaat, yet this assessment framework is not implemented anywhere in the process. Thus currently nowhere in the process of choosing the suitable contract type it is being asked whether PA could be beneficial {Q76}.

Assessment framework for PA
This assessment framework which is recently developed in Rijkswaterstaat, is to be used in considering which projects can benefit from PA. This assessment framework consists of two steps, first acting as a general filter that identifies which projects would deliver potential added value if realized via PA. And the second step identifies the motives for choosing PA as the PDM for a specific project.

Standard frameworks should be developed from the experiments, thus in the experimenting phase, it is logical that such frameworks are missing. However for its adoption, it is important to standardize the process. Additionally in the experimenting phase, the best way to overcome this barrier is to increase the motivation of the project personnel for choosing PA. This can be done either by increasing the room to experiment, creating incentives or etc.

5.1.16 Accountability concerns

This cluster of barriers focuses on the accountability concerns of the organization with regard to PA. However what makes this different than operational problems, is the fact that these concerns are not yet proven and not enough research has been done to confirm or reject these concerns. As a consequence, it is important that enough investigation is done in this regard, to ensure that the organization is not inhibited from the use of PA based on concerns that might not pose any limitations in reality (potential misconceptions).

The main idea in project alliancing is that no legal entity is required to be formed. This actually is what makes it possible for public organizations to use PA more easily. Therefore it seems redundant in PA to create a mutual company with the private party, as it will convert it to a joint-venture. And if a joint-venture is created, there would be no need to have PA! referring to the Partnering Spectrum (Broome 2002), as brought in the literature review section, joint-venture is at the far end of partnering spectrum itself. However apparently in the beginning of A2Hooggelegen project, PA was considered to require formation of a mutual company with the private parties {Q78, Q79}.

Furthermore as already explained in the literature review section (PA in the Netherlands), it appears that accountability issues do not pose any real limitations for PA. The fact that this consideration happened and is still seen as a concern shows that it could still have influence on the decision of adopting PA. If the alliance organization is seen as a legal entity, and forming a legal entity for each project is a complicated procedure that requires external permissions, then it would be much more difficult for the organization to adopt PA. Therefore this concern should be clarified, otherwise not only project teams will not initiate PA due to the complexity that it might have, but also the directors will not act as champions for it since they will consider it against the regulations.

5.1.17 Lack of champions

For a new concept to receive support in the organization, people are needed who can act as champions for it. Such people should have an influencing status in the organization and encourage the application of the concept by not only promoting it, but also by providing the needed support for it. Having champions for PA, especially in the experimenting phase is of great importance, since by encouragement of using PA, more practical experiences will be gathered, and this could lead to prove of concept. On the other hand, lack of champions, not only results in less attention and motivation for the use of PA, but also could disappoint the people who already are believers of the concept.

The role of the champion is to overcome the barriers within the organization for experimenting with PA. This can be done by providing support for it from the (other) directors, gathering the appropriate project team for it and convincing the back offices of the potential benefits. In general the champion should initiate a movement within the organization by gathering the appropriate resources and provide support when and where required. As this was also the case for the A2Hooggelegen project {Q80}. However the aforementioned ‘champion’ for A2Hooggelegen’s PA is already retired and apparently no one else has taken his position for the promotion of PA.

The current lack of champion for PA in Rijkswaterstaat can be due to two scenarios; firstly no director is actually interested enough in the concept to act as its champion (or fears the opposition of others since it is yet not a policy in the organization), or secondly due to several interested directors in the concept, a "bystander effect" is resulted. Bystander effect is a social psychological phenomenon that indicates individuals will not take initiation for helping others (or in this case for starting a movement), when other people are present (or in this case other people are considered interested in the concept as well). According to Darley and Latané (1968), an important factor causing bystander effect is diffusion of responsibility; people thinking others might be more qualified to take action or fearing the potential negative consequences of their action.

Whether the first or the second scenario is the case in Rijkswaterstaat, in the past 3 years after the completion of A2Hooggelegen, no one has acted as a true champion for PA.

5.1.18 Not enough motivation/initiation from the project teams

In theory there are two possibilities for a project to be implemented via PA, either by the directors, who could act as champions and initiate a PA as it was the case for A2Hooggelegen, or by the initiation of project teams themselves, which has not happened yet {Q81}. This is also observable from figure 10.

However as already explained, for project alliancing to be truly 'adopted' in Rijkswaterstaat, it is important that the project teams initiate it, thus a bottom-up rather than a top-down decision. For this to happen, it is important that they become motivated enough to accept the challenges of trying a new contract form, Which apparently currently is not happening to an effective level {Q82}. This motivation is not to be considered only as incentives, but can also be as a result of the conviction of project teams from the benefits of PA {Q83}.

Creating such motivation will not be an easy task, as it requires many behavioral and cultural changes for the people who are truly committed to PA. Therefore in order to reach people for this purpose, motivation should be created on multiple layers. This can be seen as an agenda for the directors to lead the organization towards a certain direction. For example, firstly it is important that the concept be promoted on the basis of its potential benefits; this can be seen as an initial step. Then by investing in the knowledge, the concept should be further developed and realized. Without enough understanding with regard to the feasibility of a concept it will not be truly appreciated in practice. Then the concerns and shortcomings with regard to the usage of the concept should be clarified. This creates a realistic expectation for it and provides better chance of continuity for it. Another important aspect is to ensure that the advantages are realized and observed from the experiences. If the benefits are not directly associated with the concept, it is clear that the concept will not receive credit and thus also not enough support and attention. And finally the application of the concept should be made as simple and easy as possible. This can be about the decision making procedure for applying the concept but also about providing the right tools for the concept. For example in a procuring organization, and in the concept of adopting PA, one important factor is to provide the right frameworks, benchmarks and references {Q84}.

This can also refer to providing a template contract, as it is also the case for D&C and DBFM contracts to be used as a reference. Therefore a sort of standardization of the concept should occur; despite not being the best course of action for the development of PA (since it might limit innovative variants), it is a realistic approach for its adoption in a large organization.

5.2 Findings of Group 2 interviews

Group 2 interviewees consist of project teams and personnel of ProRail and province of North-Holland who had experiences with project alliancing. In total 13 potential interviewees were selected, 9 of them agreed to participate.

Table 3 demonstrates the different cluster of barriers for adopting PA from the perception of project teams from these two organizations. As it can again be seen, these barriers are categorized into four groups; root barriers, project organizations, line organization and finally shared between the last two. However the relationship between the barriers will again be illustrated in a diagram. Another important issue here is that the second group of interviewees consisted of staff from 4 different projects and two different organizations. Therefore as oppose to the first group of interviewees who referred to the same project, the results in this group refer to different projects. Despite the clear differences, due to low number of interviewees and also considering the objective and methodology of the research, it was decided for the results of these interviews to be analyzed together. However in the appendix 8 and 9, a separate diagram of barriers can be seen for ProRail and PNH. And also below the number of counts in each organization is mentioned. Diagram of barriers from group 2 interviews (figure 14) is resulted from combining these two diagrams.

Table 3 - Findings of group 2 interviews

Barrier	Category	Counts (out of 9)	
Not enough investment in knowledge	Line organization	2/2 (PNH) 7/7 (ProRail)	9
High level of friction between the alliance and the main organization	Project organizations	2/2 (PNH) 7/7 (ProRail)	9
Shortage of personnel	Root barriers	2/2 (PNH) 7/7 (ProRail)	9
Unsuited organization culture	Shared	2/2 (PNH) 6/7 (ProRail)	8
No standard framework available for PA	Project organizations	1/2 (PNH) 5/7 (ProRail)	6
Backlashes of the experiment	Project organizations	2/2 (PNH) 3/7 (ProRail)	5
Complex observability of advantages of PA	Project organizations	2/2 (PNH) 3/7 (ProRail)	5
Not enough promotion for PA	Shared	1/2 (PNH) 4/7 (ProRail)	5
Recession	Root barriers	0/2 (PNH) 3/7 (ProRail)	3
Not being a priority	Line organization	2/2 (PNH) 1/7 (ProRail)	3
Not a policy to adopt PA	Root barriers	2/2 (PNH) 0/7 (ProRail)	2
Limitation from external influences (Stakeholders)	Root barriers	0/2 (PNH) 2/7 (ProRail)	2
Lack of champions	Line organization	0/2 (PNH) 2/7 (ProRail)	2
Not enough motivation / initiation from the project teams	Project organizations	0/2 (PNH) 2/7 (ProRail)	2

No systematic development process	Project organizations	1/2 (PNH) 1/7 (ProRail)	2
Unsuitable project sizes	Root barriers	1/2 (PNH) 0/7 (ProRail)	1
Bureaucracy	Line organization	0/2 (PNH) 1/7 (ProRail)	1
Not enough leadership/initiation from the directors of line organization	Line organization	0/2 (PNH) 1/7 (ProRail)	1
Operational problems	Project organizations	0/2 (PNH) 1/7 (ProRail)	1
Accountability concerns	Shared	0/2 (PNH) 1/7 (ProRail)	1

The same note about counts of the barriers mentioned in section 5.1 applies here as well. These counts are just a soft indicator of what the interviews agreed on the most. Figure 14 illustrates the relationship between the different clusters of barriers.

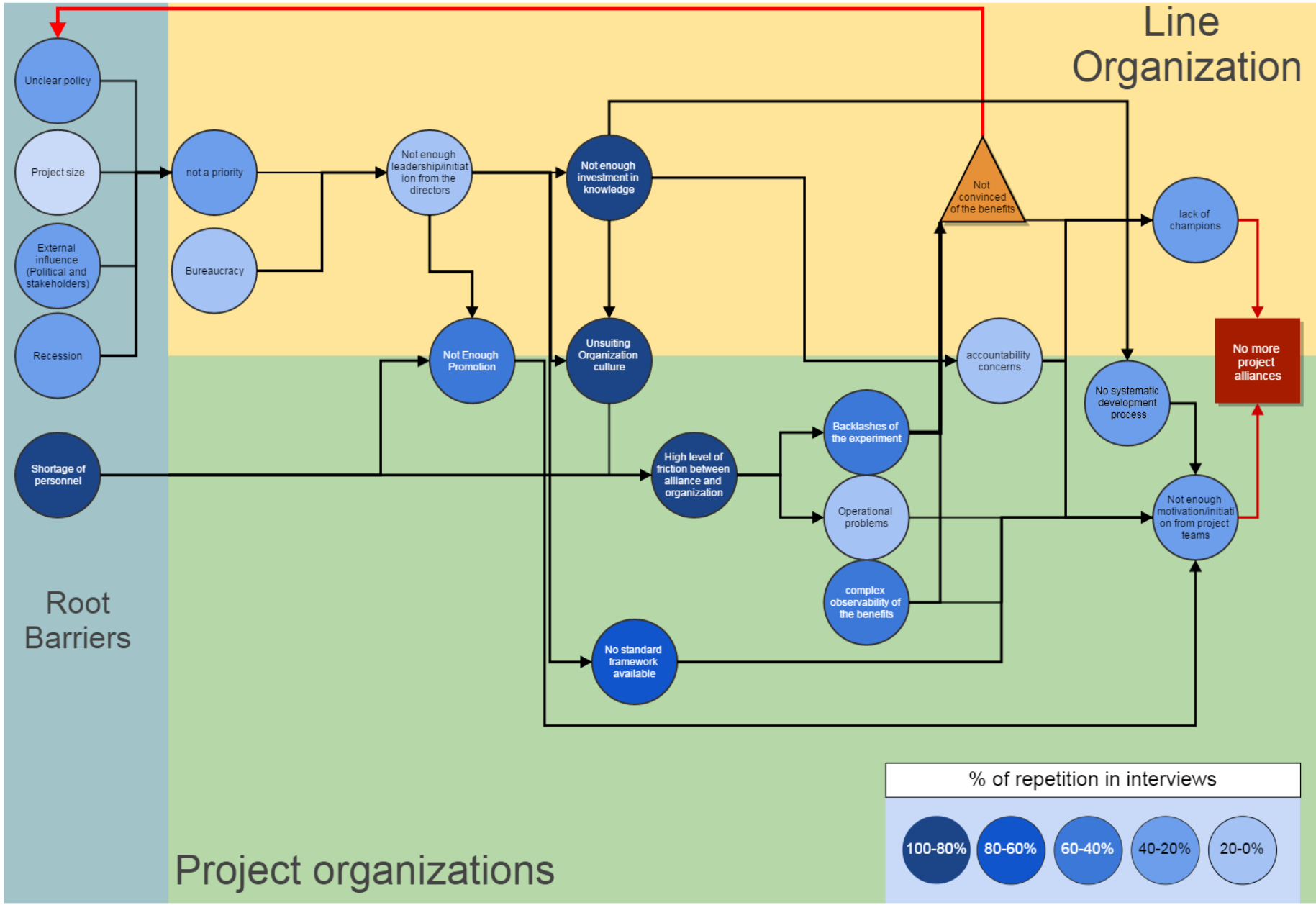


Figure 14 - The barriers schema of group 2 interviews

As it can be observed from table 3 or figure 14, 20 barriers were identified from the interviews of this group. These barriers will be explained below.

5.2.1 Limitation from external influences (Stakeholders)

This barrier refers to the influences of the external stakeholders on the decision of choosing a PA or not. In the case of PNH, this does not seem to be an issue, as stated by the interviewees. Rather the decision of experimenting with PA, was initiated due to the push by external parties {Q95}.

However for ProRail, external influences do limit some limitations. But these external influences are not stemming from the politics, but rather from the other stakeholders of the project. Two reasons are mentioned by the interviewees that ProRail is not inhibited to realize its projects via PA by politics; firstly it is a company owned completely by the government, unlike Rijkswaterstaat which is part of the ministry of infrastructure {Q98}, and secondly due to the conviction of politics that ProRail's projects could benefit more from PA than other contracting forms {Q99}.

An important factor in PA, is to include all the key parties in the alliance. Especially for the projects in the Netherlands which the complexity is mostly due to surrounding and stakeholder management, this issue becomes very important. For ProRail as the manager and operator of the rail network, their projects usually concern many municipalities, provinces and etc. Such stakeholders provide the funding of the projects. Therefore the decision for realizing projects via PA should also be confirmed by those stakeholders {Q96}. Interviewee #14 has an example of this situation that due to the aforementioned external influences, PA was not selected as the PDM {Q97}.

Consequently, the external influences inhibiting ProRail from more frequent application of PA, is not due to the politics, but rather due to other stakeholders involved in the project, who usually provide the funding of the project. But the reason that such stakeholders might resist against the application of PA, could also be due to lack of knowledge, experience and etc. Therefore for ProRail, it appears to be very important not to only diffuse the concept of PA within its own organization, but also puts effort in promoting this concept within the organizations of their project's stakeholders.

5.2.2 Not a policy to adopt PA

As mentioned in table 3, this barrier only concerns PNH. Both interviewees stated that PNH is not yet ready for this policy and is currently perusing other policies, such as adoption of D&C contracts {Q85, Q86}. In 2006, the main focus of PNH was on RAW (traditional) contracts. In that period, their policy with regard to RAW contracts was beginning to change. Consequently an experiment with project alliancing has been done. After that experience the focus of PNH seems to be diverted towards adopting D&C contracts in their practices. Despites potentially many factors affecting this change in policy development, the understandably large shift from traditional contracts to PA is considered to be an important one.

On the other hand, interviewees from ProRail have confidently stated that the policy of ProRail with regard to adopting PA is clear and in place. This is due to the fact that PA is considered to deliver more value to the rail projects than other partnership models {Q87}. The connectivity of rail networks, complicated technical installations and ICT systems and not requiring private financing are considered decisive in this regard {Q87, Q88}. Another reason considered causing the formation of such policy in ProRail, is that the organization has been trying to find a balance between being a fully procuring or a technical organization, in order to become a professional client {Q89}.

Becoming a professional client appears to be an important motive for ProRail in pursuing project alliances. This is also mentioned in the hand-guide of PA (ProRail 2011). As mentioned in the literature review section, PA provides the opportunity of more informed involvement of the parties.

To sum up, it can be observed that PNH is currently not concerned with the policy of adopting PA, as their attention is diverted to adopting D&C contracts. Existence of this barrier in such context, can be seen as the main barrier for not adopting PA, thus might be considered by many the end of the investigation for identifying barriers within PNH. However gaining more insights about other barriers, even if less problematic, can be quite beneficial for other organizations such as RWS, in the sense that due to limited experience, considering other projects and organization would provide more learning opportunities. On the other hand, ProRail is not experiencing any problems with regard to the policy for adopting PA.

5.2.3 Unsuitable project sizes

From the interviews, it appears that the general opinion with regard to the suitable project size for PA is that it should have a "considerable" scope in order to provide enough room for improvement and bring added value at the end. This is due to the fact that due to formation of a virtual organization, PA is considered to require more investment in the beginning phases of the project than other contract types {Q90}.

However there appears to be no common view on the project budget margins that define a "considerable scope". Yet, interviewees #9 and #10, consider most of the projects of PNH too small for PA {Q91}.

Therefore this issue can be seen as a reason why adopting PA is not being considered in PNH. However as interviewee #9 explains further, there are also projects that conform to the perceived characteristics that are suitable for realizing a project via PA, but yet other approaches are preferred {Q92}.

The issue of appropriate project size for application of PA, has caused ProRail to create the concept of "mini alliances", which is incorporating a PA component in a regular D&C contract. This concept is to be implemented in projects under 40 million euros threshold, with very limited number of risks that could be shared between the parties {Q93}.

This being said, one of the interviewees believes that PA can be even more suitable for relatively smaller projects. His reasoning is based on the experience with "Bataafsealliantie" in Houten project. According to this interviewee, having a smaller scoped project translates in requiring a smaller project organization, which resulted in a more efficient alliance organization. On the other hand, with large alliance organization, a scaling problem could occur {Q94}.

To summarize, it can be observed that agreeing on the appropriate project size for PA is not easily done. Although the general opinion that a considerable project scope is required to ensure the added value, there has been a successful experiment with small project alliance. For ProRail, the project size does not seem to pose any limitations or barriers but for PNH, according to the interviewees, having relatively small projects is one of the reasons for stoppage of PA. Interestingly enough, interviewee #11 finds smaller projects more suitable for PA, as it will make the management of the alliance less complicated and creation of soft skills between the team easier.

5.2.4 Shortage of personnel

As mentioned before, a good balance in the alliance organization provides better cooperation. But shortage of personnel due to governmental cutbacks of the recent years has made allocating personnel to the alliance, problematic for public organizations. To overcome this problem, public

organizations in the Netherlands have provided a good balance in the alliance management team, but on a lower level, the misbalance still poses many difficulties. For PNH, an important issue was the fact that almost all the personnel allocated to the alliance organization from the public side, were temporary hired staff {Q102}, but this was also due to the lack of knowledge in the organization with regard to PA.

Providing all the alliance organization with 100% hired staff to represent the main organization can bring out many problems. The idea for the alliance organization is to be made of personnel from both parties, thus creating a mutual (virtual) organization that has a shared culture and expertise of both parties. Additionally it is important that both parties consider the alliance organization a good ambassador of their own organization. However if none of the personnel in the alliance organization are permanent staff of the main organization, achieving such goals becomes problematic {Q103}.

One important aspect in the success of alliance is to ensure that there is a good bond between the alliance organization and the main organizations. Having mostly, or in the case of PNH all external staff in the alliance, causes distance in the aforementioned relation. As it will be explained later, this also influences “high level of friction between the alliance and the main organization”.

Another issue that interviewee #10 mentions, refers to the bigger picture of adopting PA. It is clear that for adopting PA, gaining experience is necessary in the organization. Having only external staff in the alliance organization causes first hand experiences to be taken away from the main organization at the end of the project {Q104}. Therefore by the end of the project, PNH as an organization has not gained this first-hand experience with regard to PA. This was also the case for ProRail in their first experience with PA, in the Betuweroute project {Q105}. However in the next years after Betuweroute project, ProRail put more effort in gaining the related experience in their own organization by allocating more permanent staff to the alliance organization, or by keeping the external personnel hired for next projects. ProRail appears to be doing this in a transitional way; in their second experience with PA, some permanent staff were allocated. And in their third experience, the ratio of permanent staff has been considerably increased. Such action has ensured that not only the project will benefit from the experiences of the external staff, but also the internal staff will get the opportunity to acquire such experience, thus bringing it back to the main organization at the end of the project.

Despite the aforementioned discussions, two of the interviewees, #10 and #11, believe that having an external alliance manager is better than filling this position with an internal staff of the public or private organization. It is believed that external alliance manager can act as an neutral position that can better safeguard the interests of both parties, and results in a better equality {Q106, Q107}.

It is important to mention that despite both alliance managers in projects N201 (PNH) and Houten (ProRail), were external staff, only in the case of PNH, the alliance manager was brought in by both parties. In the latter case, the external alliance manager was hired by ProRail and thus representing them in the alliance.

But returning to the issue of the balance of the personnel in the alliance organization, for ProRail also this is seen as a setback with receiving enough acceptance and trust from the main organization {Q108, Q109, Q110}.

But then the question arises that since ProRail is a procuring organization (such as other public organizations mentioned in this thesis), whether providing additional staff delivers any added value for the alliance organization or not. And if so, which positions could have been filled with the

personnel of public organization? According to interviewees #13 and #14, the most added values would be by providing personnel in the stakeholder and surrounding management {Q111, Q112}.

Despite the governmental cutbacks and lack of qualified personnel {Q115}, other practical issues could also be the reason for difficulty in assigning personnel to the alliance organization; people not wanting to work in the project site due to the different working environment and situation {Q113}, or due to relatively longer commute {Q114}.

As a result, it can be clearly observed that not having a balance in the alliance organization is perceived as a setback between the interviewees. Interestingly, all of the interviewees agree on this setback and find it important that for the future projects, a better balance between the numbers of personnel should be created in the alliance organization. For all of the considered projects, the balance on the management level and the alliance board team was good but on the work level there was a considerable misbalance.

For PNH, if adopting PA was really considered from the beginning, it would have been wise to allocated at least a number of permanent staff to the project organization in order to gain the knowledge and experience for the future projects. For ProRail, not only governmental cutbacks is seen as an important factor for this setback, but also the practical issue of moving to the project location is seen as an contributing factor for people not willing to join the alliance organization. Furthermore, providing the personnel who have the right mentality and mindset to work in the alliance is also seen as a challenge.

5.2.5 PA is not a priority

According to both of the eligible interviewees representing PNH in their PA experiment, adopting PA is currently not a priority for the organization. As interviewee #10 states, the current priority for PNH, is to adopt D&C contracts, as oppose to traditional contracting that they are yet practicing {Q116}.

As already mentioned, in PNH, the policy towards PA seems quite different than the approach of Rijkswaterstaat or ProRail. They are currently not concerned with adopting PA, thus it is logical that there is no priority for this purpose, despite the arguably successful pilot project.

For ProRail, only one of the interviewees finds not being a priority as a barrier for adopting PA; stating that adopting PA could have been a “vibe” and the attention for it has been decreased in the recent years {Q117}. This could be due to several factors such as too many organizational changes such as the reorganizations, or diverted focus on other new tools or processes. But the consequence is that the required energy for this purpose is not currently being given to adopt PA.

5.2.6 Not enough leadership/initiation from the directors of line organization

This barrier is only acknowledged by one of the interviewees (#14) from ProRail. As mentioned by this interviewee, in order to have more project alliances, it is important for the directors to take the lead and initiate it as it was also the case for OVSAAL project. If a project is defined to be realized via PA, it would be easier to find the appropriate project team and staff for it {Q119}.

On the other hand, if the decision for realizing a project via PA is laid on the project teams themselves, due to limited experience and potential fear of unknown, it is less likely to be accepted. This is especially the case in the experimenting phase of adopting PA where the organization has very limited knowledge about it. Therefore as it was also the case for Rijkswaterstaat, it is important that

during this “experimenting with PA” phase, directors take the lead in order to provide the organization with the learning opportunity of this concept.

5.2.7 Not enough promotion for PA

As already explained in the last section, promotion of a new concept is vital for its adoption in the organization. If the people don’t know enough about the concept and what is the added value of it, then logically they will not pursue it. 1 interviewee from PNH and 4 from ProRail identified this as a barrier for adoption of PA. It appears that the burden of this promotion currently lies on the shoulders of project teams in the organizations. Despite being vital for project teams to share their experiences for promoting the concept of PA {Q168}, it was not enough {Q169}. This is due to the fact that the priority of the project teams is to deliver the project, thus the time and energy allocated for the promotion purpose is limited {Q170}. Consequently having the expectation for project teams alone to do the promotion of the concept is wrong. Additionally, for better promotion, it is important for this task to be done by both project teams and also directors, who can have more influence on their concerning departments.

5.2.8 Not enough investment in knowledge

Another identified barrier that all of the interviewees acknowledged was the lack of enough knowledge with regard to PA in their (representing) organization. For PNH, not only this appears to have influenced the decision on further experimenting with PA {Q120}, but also it has negatively influenced their first experience in the beginning; a knowledge misbalance was observed between the representatives of public party and the representatives of private parties {Q121}. Examples of the problems that this misbalance of knowledge between the client and the contractor were: resulting in a crooked contract between the parties, delay in the approvals by the client, creating difference in interests and etc. These together resulted in mistrust between the parties {Q122}.

The lacks of knowledge with regard to PA as stated above refers to the interaction of alliance organization with the main organization (PNH). PNH had provided the alliance with external staff who assumedly had more knowledge about PA but if there is not enough familiarity with regard to different aspects of PA within the main organization, the interaction with the alliance organization will not be done correctly, causing problems as it will be mentioned in the barrier “high level of friction between the alliance and main organization”.

One of the reasons that private parties had more knowledge about PA is seen due to their involvement in other project alliances in the Netherlands (as also observed in the literature review section), however as claimed by interviewee #10, they are also still lacking enough knowledge in this respect {Q123}.

For ProRail, lack of knowledge and experience was also considered by all the interviewees as a barrier for adopting PA; having a very limited number of project alliances, resulted in limited knowledge {Q124}. Thus increase in knowledge is considered to only be possible via more experiences, as it was also the case with D&C contracts in ProRail {Q125, Q126}.

The lack of knowledge can also become a barrier through the fear that is associated with unknown {Q127}. This barrier is considered by some of the interviewees to be felt more for public parties than private parties, since due to limited number of eligible contractors active in the infrastructure market of the Netherlands, the experiences of different public organizations in PA is shared on the private side as they become involved in the new projects. However such experiences seem to be less shared between the public parties {Q128}.

From the above discussions, it is clear that despite ProRail's effort to adopt PA, there still hasn't been enough investment in the knowledge of the personnel with regard to PA. However this is not an easy task since first-hand experience is regarded as the most effective way of acquiring this knowledge and due to the relatively long period of each project, developing this knowledge in the organization takes a long time {Q129}. This makes achieving enough experience and knowledge for PA in the organization, a time and energy consuming process.

Another attention point in the PNH and ProRail, as it was also the case for Rijkswaterstaat, is the different views on what defines project alliancing. It is again here observed that the definition of the interviewees for PA is related to their function and differ with each other {Q130, Q131, Q132, Q133}.

As it can be observed, even for the staff working in a PA, a common definition for it is not reached. This can be an indicator of different perceptions with regard to PA in the organization, which might not be a negative issue on itself but can be troubling for its adoption in the organization. This is due to the fact that without a common view on what project alliancing is, no standardization of the concept can occur. This standardization is very important for adoption of the concept in large organizations. Furthermore with different definitions for PA, different opinions can be formed with regard to which project is a PA and which is not, thus increasing the confusion associated with PA.

5.2.9 Not suiting organizational culture

Having unsuited organization culture is seen by 6 interviewees from ProRail and 2 interviewees from PNH as a barrier for adopting PA. As already explained, PA is based on trust culture; however for a long period organizations have focused on control culture {Q171}. Therefore the shift towards the appropriate culture for PA cannot be expected to happen overnight. Since alliances are rare, it is logical that the dominant mentality of the organizations is of controlling {Q174, Q177}. As a result working closely with the contractor is seen as a violation of previous principles. This resulted in the alliance organization to be considered part of the contractor's organization {Q175} and to naïve to think they can make it work {Q176}. If there is no trust between the parties, the alliance organization will not function properly and thus the benefits will not be achieved {Q178}.

The majority of the interviewees have similar opinion with regard to the dominant organizational culture of ProRail and why it is not suitable for project alliancing. As already mentioned in the literature review section, the shift from control-based towards a trust-based culture plays an important role in adopting PA. However it is understandable that this shift can be a huge challenge. As interviewee #8 puts it, a traditional organization within a traditional market, makes it difficult to adapt fast {Q179}.

Another issue with regard to the culture, is the dominant culture of the alliance organization; with a great misbalance between the number of personnel from public and private side, the culture of the alliance team organization will be influenced more by the party with more personnel. As a consequence, creating a mutual and compatible culture in the alliance team becomes a bigger challenge, especially if there is a large difference in the culture of parties {Q180}. This cultural difference, or cultural shock in extreme form, can negatively influence the performance of the alliance team. On the other hand, having a compatible culture, mentality and interpersonal relationships will contribute to a better performance of the team.

Therefore it is important before forming the alliance; parties assess each other to see whether they can work together, with regard to such characteristics. As interviewee #16 mentions, it appears that

Rijkswaterstaat has been more successful in approaching PA with attention for such compatibility {Q181}.

Another cultural factor that was considered by the interviewees to be a setback for PA in PNH was stemming from more personal considerations; **(a)** due to the different approach of PA, personnel in the organization have partly seen it as a threat to their own function {Q172}, **(b)** working from a separate location was considered to be equivalent of more freedom of action, and this triggered envy between some of the people {Q173}.

(a) Using PA for realization of a project, rather than traditional contracts which were the main focus of PNH, will of course bring some changes to the organization. No matter how small these changes, people might consider them a threat if it would influence them. One example of these changes can be that the expertise of some people might be considered less valuable due to adopting new way of working that has a different approach towards their function.

(b) The to the potential feeling of envy, the fact that all the project team staff were external, will increase the distance created between the personnel of the organization and alliance. If such issues exist, then the friction between the main organization and the alliance will become more and problematic.

To sum up the results of this cluster of barriers, it can be said that culture plays an important role in successfully adopting PA in an organization, with 8 out of 9 interviewees currently seeing it a challenge for their organization. However there are two different organizational cultures relevant for PA: the culture of main organizations and the culture within the alliance team.

For the culture of main organizations, despite mentioning that there are different aspects of cultural barriers for PNH and ProRail, they both refer to a similar issue; control vs. trust.

Currently the public organizations (and probably the whole industry) have dominantly a control culture. This control culture creates a “we vs. them” mentality; a strong internal bond but distanced from the external parties. For PNH, since the personnel of alliance team and even the program of N201, who in principle were representing PNH, were contracted from external parties, this “we vs. them” mentality was much stronger and as it can be observed from the quotes it caused a sense of separation between the colleagues. For ProRail, despite the fact that in the beginning this sense of separation was less between the colleagues (of the same organization), due to strong control culture it was still challenging to create the ideal culture for PA. As a consequence, it can be seen that the bond between the colleagues was broken when they moved to the location of alliance organization and they were unexpectedly perceived as the “outsiders”.

For the culture of the alliance team, even though the cultural compatibility plays an important role and is in principle more complex than the former cultural issue explained, since it is the frontage that the work is being done between the parties and many more cultural issues can arise, yet it is managed easier since it is possible to select the “right” people for it. Thus it is observed that the alliance teams have experienced less distress from cultural difference between themselves than they have experienced from their main organizations.

5.2.10 High level of friction between the alliance and the main organization

As it was already mentioned in the analysis of the findings from group 1 interviews, high level of friction between the alliance and main organization, namely the public party, has been observed as a barrier for the anticipated performance of the alliance. This appears to also be the case for PNH and

ProRail. Interestingly enough, such high level of friction is seen in all the studied project cases and has not yet been improved throughout the years. Again here it is emphasized that a moderate level of friction can be constructive since it will create an adequate pull-push approach, however if the friction becomes more than that level, it will hinder the flexibility of alliance and could result in a dysfunctional alliance organization.

Despite the fact that the alliance organization is an integrated project team from all the key parties, they still need resource, assistance, approval and support from the main organizations to properly function. This mainly concerns the back offices of the main organizations. All the 9 interviewees of this group claimed such "high level of friction" was present in their experiences. For PNH, it is stated that a mentality of ''we vs. they' was observed between the main and the alliance organization, as if the alliance was a completely independent party {Q135}. It is claimed that this mentality could have been the result many factors, for example low number of personnel representing PNH in the alliance, control-oriented culture of the organization and etc.. But one important factor was having externally hired personnel, working on a project (N201), within a program (N201+) which also has externally hired personnel. This led to distrust for the alliance organization {Q136}. The existence of an extra intermediate program organization between the project organization and PNH has caused even more distance between the alliance and the main organization. Especially since both program and project organization were staffed with external personnel, instead of permanent personnel of PNH.

Project alliance teams in ProRail have also experienced the same distance from the main organization, mainly with regard to the trust required. Consequently, the alliance organization was being considered the new contractor of the project, instead of a party comprised of ProRail's personnel and representing its interests {Q137, Q138, Q139, Q141}.

As explained by interviewees #12 and #17, it appears that most of the frictions between the alliance and ProRail occurred due to the scope changes. This could bring out a lot of problems especially since PA is mostly used and promoted for projects that have potentially a lot of scope changes due to high uncertainty. Therefore if such scope changes cannot be handled efficiently in the alliance, not only the benefit of PA is disregarded but also it could even result in more inefficiency than conventional contracts since a third party is added to the equation (figure 7) {Q140}.

Having a dedicated team to the project is important but on the other hand, cutting the ties with the main organization could result in the aforementioned issues. Therefore a balance should be created in this regard; project teams should be dedicated to their project but also ensure that they maintain a good relationship with their main organization thus ensuring them that the interests of the main organization is being considered and safeguarded.

Another suggestion from one of the interviewees is creating a short communication line between the alliance and at least one/two of directors within the main organization by having them in the alliance board team {Q142}, thus creation of a 'shortcut' for the required support and approvals.

On the other hand, in other projects there were some attention points regarding the alliance board team. As explained in the literature review section, with regard to the organizational structure of PA, many of the important decisions are unanimously made in the alliance board team, usually consisting of equal number of people from both/all parties. An example of such important decisions can be scope changes, something that was already mentioned as a factor in creating distrust between the alliance and the main organization. It is expected that the alliance board team (ABT) would also act as an intermediate between the alliance organization and the main organization in communicating these changes, after reaching an agreement. This way ABT is also responsible to ensure that required

actions are taken as soon as possible. However it appears that the being in the alliance board team is regarded as a ritualistic role, with only monthly meetings monitoring the performance of the alliance. This led to very limited involvement of the alliance board team in the interaction of alliance management team and the main organization {Q143, Q144}.

If the project runs smoothly, the friction level between the alliance and main organization will be dropped, therefore there would be less required for the constant involvement of ABT in the project {Q145}. But if problems occur or encouraging news stop, then the aforementioned frictions will as expected become more, thus the role of ABT becomes more vital in creating trust between the parties.

To sum up, it is observed that such high level of friction has occurred in all the case study projects. And as already mentioned, a health level of friction could be beneficial but if escalated more, it can result in a dysfunctional PA; especially if the project runs into potential difficulties or has scope changes. To overcome this problem, firstly it is advised that more personnel from the public side to be assigned to the alliance team, ensuring a good representation of the public party. Furthermore the role of ABT should be more emphasized on in the case of public parties. As mentioned by one of the interviewees, this function is better defined for private parties due to their experiences in working in combinations and consortiums. But for public parties, this is a newly created function that appears to be currently regarded as solely a supervisory level. Even though this is not a direct barrier for adopting PA, it has consequences that will indirectly lead to not adopting PA, this indirect relationship can be observed from figure 14.

5.2.11 Backlashes of the experiment

As it was mentioned several times, all of the project alliances in the Netherlands are considered as an experiment. Despite the success achieved, backlashes of experimenting with innovations as explained in the literature review section can cause its problematic adoption. In the case of projects studied, some attention points have been observed that were also mentioned in the interviews. Below these attention points are mentioned. What makes them a backlash is the fact that they could have been avoided with better planning, arrangements and clarification.

One example is the change from detailed project specifications (in RAW contracts) to function specifications (in D&C and PA), which apparently was not discussed enough before the project. In the former, the client knows the exact specifications that are to be realized, but in the latter, only the functionality of the specifications are known. As a result, despite conforming to the specifications, some issues might arise that can be seen unfavorable for the client; for example for different projects, components such as asphalt, lighting and etc. can have different specifications despite the similar functionality. This resulted in requiring different maintenance work for N201 project than the rest of the network, which is seen as a limitation of function specification by PNH {Q150}.

Another potential backlash was the ambiguity with regard to the arrangements between the parties and difference in interpretations. This lack of clarity resulted in lengthy discussions that were solved only by bringing the people from both sides back together to clarify the arrangements {Q151}. Yet another backlash in N201 project is considered to be the optimizations found in the project design; as claimed, many of the optimizations could have easily been identified by PNH itself, in the reference design and before the tendering procedure. Thus the benefits for it could have been completely claimed by PNH. But in practice, those benefits were not identified by the organization on-time and thus the benefits were divided between the parties {Q152}.

It is however noted that the parties should not try to bring all the benefits towards themselves and away from the alliance. Thus a balance should be created with this regard. As interviewee #9 states, ProRail's approach with regard to the optimizations is very different than PNH, but they can be considered too extreme in bring the benefits to themselves, especially with the tendering procedure they used in OVSAAL project.

For OVSAAL project, there were also some backlashes, nearly leading to the termination of PA; a conflict with the private party in the arrangements, caused doubts on the transparency of the alliance and resulted in negative consequences for the trust between the parties. But eventually such conflicts were solved {Q153}. Thus if more clarity with regard to the arrangements were created from the beginning, such negative experiences would have not occurred. However as "experiments", these backlashes should be seen only as learning points for future experiences. But unfortunately in reality they might negatively influence the opinion of directors and organizations with regard to PA.

5.2.12 Operational problems

The distinction between operational problems and backlashes are that the former can be also expected in the future projects but hopefully the latter will be avoided due to past experiences.
Only one interviewee by ProRail considered operational problems as a barrier for adopting PA; having large scope changes will hinder the project team's ability in achieving the project goals. This is especially troubling since the setting up an alliance organization and creating a mutual culture is itself a complicated task, thus combined with the scope changes, the alliance team will have trouble coming to its strengths {Q154, Q155}.

One of the main benefits considered for PA is its better management of scope changes in the projects. However as mentioned above, it appears that PA has not been successful enough in managing the scope changes in at least one of the studied projects. This dilemma can be explained in other words: In PA, the main organizations assign some of their tasks to the alliance organization and in principle will not interfere with what the alliance organization thinks is the best for the project. But with scope changes, the main organization will again become very involved in the domain of the alliance. Therefore the personnel of each party in the alliance organization will be under pressure to act also in the interest of their own main organization, rather than solely focusing on the best for project actions. Contrary to what is anticipated, this will pull the personnel back to their main organization and away from the alliance, at least until an agreement is reached and alliance can function normally again. And as mentioned by the interviewees this will prevent alliance organization to reach its full potential as a team. Again this issue is directly related to high level of friction between the alliance and main organization and also the role of ABT.

5.2.13 Complex observability of advantages of PA

As it was also the case for Rijkswaterstaat, complex observability of the benefits of PA seems to cause difficulty with its adoption in ProRail and PNH. In order for a new process such as PA to be adopted in an organization, it is important for its benefits to be clear and comprehendible. This refers to what was already explained in the literature review section as one of the five attributes of innovation that influences its rate of adoption, observability. However the fact that no two PDM's can fairly be compared with each other in a completely identical situation, due to the unique features of each project, proving the benefits and providing comparable results with regard to time, cost, quality and other KPI's is difficult to do. For example as interviewee #10 explains N201 program of PNH, consisted of 7 projects which 6 of them were realized via traditional contracts (RAW) and one was realized via PA. Despite being the largest project of the program, fewer discussions were observed between the parties and the project ran smoother. However proving that the "smoother"

realization of the project was mainly due to realizing it via PA and not due to project characteristic is a very difficult, if not impossible, task {Q156}.

Project alliance teams in ProRail also experienced the same difficulty in showing the benefits of PA compared to the conventional contracts used. For example in OVSAAL project, interviewees believe that the project was managed better with PA than it would have been by other contract types. Especially due to the many scope changes that would have caused a disastrous situation with conventional contracts. But it is doubtful if other people in the organization are of similar opinion {Q157, Q158}. Therefore convincing the organization for the benefits delivered due to PA is a challenge. Furthermore as interviewee #16 explained {Q158}, when the financial arrangements followed, there were critics with regard to the solutions implemented due to not being economically the most advantageous ones. However the question here is whether in the critics, the value of time and the resulting monetary consequences were also considered or not? This is only one other criteria influencing the result. In other words, for such critics to be valid, it is important to look at the bigger picture with regard to the project; making it a complicated equation to fairly assess the benefits.

Other benefits mentioned for PA by the interviewees also have “hard-to-observe” nature. For example a better stakeholder management {Q159}, better communication and sharing of knowledge with the private parties {Q160}, better cooperation and relationship between the parties {Q161}.

It can be observed from the above quotes that the benefits of PA are more concerned with relationship aspects. As explained in the literature review section, improving the relational and interpersonal aspects in the partnership will improve the hard results. Despite almost no one claiming the opposite, it is still challenging to truly prove and believe this connection. Especially in the construction industry which has been focused on hard results for decades, It is important for benefits to be directly observable in hard results. This is something that was recognized by interviewee #11 from the beginning of the project {Q162}. Showing the benefits on measurable results helps with gaining support for it. Especially since the concept has not yet been proven for the organizations, this focus on end results is very important. But on the other hand, despite such efforts, there were still critics with regard to the legitimacy of the achievements {Q163}. Therefore despite the fact that project had no cost overruns and actually saved money by reducing the costs through optimization {Q164}, the benefits were still not proven to some people.

As a result of the above mentioned discussions, the complex observability of the benefits is considered to be negatively influencing its further application. This complex observability is somewhat caused due to the fact that the benefits of PA are more related to the interpersonal and relational aspects of the projects, and indirectly affecting the hard results; but also due to the fact that it is almost impossible to compare different approaches of project delivery in identical situations to have a flawless comparison.

5.2.14 No standard framework available for PA

Having a standard set of concerning frameworks and documents can ease the application of a new contract form since they will be used as references and will reduce the amount of work needed by project teams to draw the contract. In the experimenting phase, it is logical that these standard frameworks are yet to be drafted and made available but with every experience, more insight about drafting such documents will be gained by the organizations. ProRail has the lead in preparing such frameworks required by PA between the public organizations in the Netherlands but there is still a lot to be done for this purpose. By preparing standard frameworks for PA, it is meant to standardize its concept. As explained before, this is not the best approach for the development of PA, but is the realistic approach for adopting it in a large organization. Furthermore, such approach will provide the

opportunity of building on the past experiences and heading towards a deliberate development process {Q146}.

5 interviewees from ProRail and 1 from PNH have considered lack of standard frameworks to be a barrier for adopting PA. According to the interviewees, for the last PA of ProRail, OVSAAL, the contract and the required frameworks were still not standardized but it appears that ProRail is seeking to standardize the concept of PA with the experiences gained from OVSAAL {Q147, Q148}.
Despite this barrier being mentioned in the section related to the project organizations (figure 14), it also requires cooperation and effort from the different departments within the organization. Project teams should still provide their detailed experiences to the concerning departments and help them develop the required frameworks {Q149}.

At the end, it should be again emphasized that the standardization of an innovation is done to realize its application. If organizations are seeking to adopt PA, they should not only invest more in the knowledge of it, but also standardize the concept by providing related frameworks to ensure its easier application. Especially since this has been done for other PDM's and is how project teams and organization are used to.

5.2.15 Accountability concerns

Only one of the interviewees (#17) considered accountability concerns as a potential barrier for its adoption in ProRail. Accountability concern mentioned by interviewee #17, refers to the false impression about lack of division of tasks and responsibilities between public and private parties in PA {Q182}.

This concern can be due to the fact that people are not yet used to joint-responsibility of parties in PA. In conventional contracts, the responsibilities of parties are separated in the contract; however in PA, despite defining clear roles and tasks for each party, the responsibility of the project is carried jointly by the parties. Nonetheless, the role of public and private parties are well defined and clear in the alliance, thus as explained in the literature review section, it will not cause any violation of regulations.

5.2.16 Lack of champions

For proper transition from the experimenting to adopting phase, it is important that the organization acquires enough knowledge, experience and familiarity with regard to different aspects of PA. As already explained, this can only be achieved if more projects are realized via this PDM. On the other hand, with lack of knowledge and experience, it is less likely for project teams to choose PA for the realization of their projects. Therefore the already referred loop of figure 12 will occur. In order to escape this loop, it is necessary for the directors to lead the organization towards more experiences, and the best way for this purpose is having champions within the organization promoting the concept of PA, that people will look up to and follow. On the other hand, lack of champions could mean being trapped in the aforementioned loop, and thus the transition from experimenting to adopting phase will be hindered. By considering the theory of innovation graph (figure 15), the role of champions is vital to reach the tipping point of diffusion of innovation {Q134}.

Two participants from ProRail saw the lack of champions as a barrier for adopting PA. Despite their similar description, one emphasizes on champions motivating the people and the other on champions giving strict orders to project teams to increase the knowledge to the minimum required level.

Adopter categorization on the basis of innovativeness (diffusion of innovation)

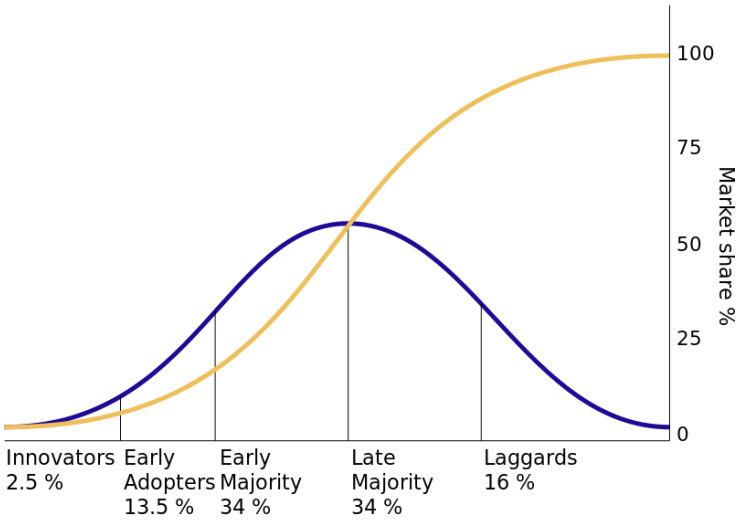


Figure 15 - Adopter categorization on the basis of innovativeness

According to Rogers (2003), innovations are not adopted by all individuals in a social system at the same time. Instead they tend to adopt in a time sequence, and can be classified into adopters categories based upon how long it takes for them to begin using the new idea.

Adopter distributions closely approach normality. The above figure shows the normal frequency distributions divided into five categories: innovators, early adopters, early majority, late majority and laggards. Innovators are the first 2.5 percent of a group to adopt a new idea. The next 13.5 percent to adopt an innovation are labeled early adopters. The next 34 percent of the adopters are called the early majority. The 34 percent of the group to the right of the mean are the late majority, and the last 16 percent are considered laggards.

5.2.17 Not enough motivation for the project teams

Two of the interviewees (#11 and #17) found project teams not having enough motivation for using PA as a barrier in its adoption in ProRail. With not enough motivation, project team will not only initiate PA, but will also try to negatively influence any decision that might lead to PA {Q165}. Considering that the decision for the contract type is not completely objective, the influence of project team can be decisive.

5.2.18 Recession

The global economic recession of the past several years has coincided with the period of PA development in the Netherlands. This barrier refers to the consequences that recession had on the application of PA. Three of the interviewees from ProRail, believe that the recession had indirectly affected the progress of ProRail towards adopting PA. Two of which believe this indirect effect is due to the conduct of the contractor; as difficult economic situations pushes the private parties tend to infringe the principles of project alliancing such as trust and transparency, in order to ensure the continuity of their organization. {Q100}. And in a PA, if one party does not conform to the principles of the alliancing, the alliance is doomed to fail, making it a tough situation for project alliancing to be applied.

On the other hand, interviewee #11 believes the barrier with regard to recession is due to the conduct of the client; in the difficult economic situations, the client has a stronger position and the

upper hand for negotiation, thus it is possible to procure the projects with lower prices via conventional contracts {Q101}. According to this statement, the public parties tend to use the recession in their favor to receive lower prices for their projects, and this is easier done with D&C and DBFM contracts that have a fixed price than a contract type such as PA which would share the potential cost overruns. Thus the use of PA is delayed due to the fact that the public parties can be able to benefit more from other contract types during hard economic situations that push private parties to compete more on the projects.

5.2.19 Bureaucracy

Bureaucracy in large organizations is known to be driven by high productivity and control, but causes low innovative capacity. For project alliancing, as any other innovative process, this bureaucracy can cause problems. In the interviews, only one count of problems with regard to bureaucracy in the organization was identified, but the statement in this regard, refers to a very interesting issue that could be seen as a significant barrier for adopting PA; impermeable clay layer of middle managers in the organization who are oppose to project alliances {Q118}.

What interviewee #11 refers to is the problem of bureaucracy due to different levels of management, as is very common in large organizations. For any new process that concerns the organization's policy, such as PA, to be adopted, it is important to develop approval for it in the different levels of the organization. On the other hand, due to hierarchical structure of the organizations, if this approval is not developed in one of the levels, it will not be correctly communicated and transferred to the lower levels of the organization.

5.2.20 No systematic development process

In total 3 interviewees found having no systematic approach towards development of PA a barrier for its adoption in their concerning organization; 1 from PNH and 2 from ProRail.

This barrier refers to the fact that for a new process to be adopted in an organization, that process needs to be tailor-made and developed to the needs of the subject organization. For this purpose, having a development plan is beneficiary in order to ensure that the development process is on the right track and decisions regarding the use of the concept to be adopted is based on the right motives and choices. This also means that for PA to be truly adopted within organizations, it is important for its application to be considered rationally and not emotionally or due to other factors such as personal motives of the people. The opposite is also true, to reject PA, rational reasoning should be done, which apparently has not been the case for PNH {Q166}.

Another interesting issue referred to by interviewee #15 is that currently the motives for choosing PA are inconsistent in different projects; having different motives for using the same principles is considered to contribute to a disorganized development process {Q167}. As a result of inconsistency in motives for choosing PA, it is difficult to systematically identify the projects that would benefit from PA. And if this identification is not done systematically, then the decision for realizing a project via PA or another PDM will be influenced by other factors, such as personal preference or any other hard to reason factors, rather than explicit reasons. Furthermore, by not having a systematic approach towards the development of the concept, the development process might not proceed as intended.

5.3 Conclusion of the group 1 and 2 interviews

The barriers identified from interviewing the first and second group of interviewees have been explained in this section. Each barrier mentioned is actually a cluster of related barriers that refer to the same shortcoming or problematic issue. Furthermore four main categories were created for these clusters of barriers; Root barriers (general organization), Line organization (barriers regarding the directors), project organizations (barriers regarding the project teams and project related personnel) and shared barriers between line and project organizations.

Root barriers refer to what the author believes are the root of the fact that PA has not yet been adopted within Rijkswaterstaat. They do not refer to a specific function or role but rather to the organization as one. Therefore they can be used as a starting point for overcoming the barriers of adopting PA in the organization.

Barriers regarding the directors refer to what project teams consider should be solved by the directors. These barriers have definite consequences for the project teams as well but they require the initiation of directors. These barriers are on a more general level than just a project. They refer to the whole program of adopting PA.

Barriers regarding the project teams are what they consider should be eliminated by themselves. The majority of these barriers refer to the pilot project; however as a pilot project for the concept, it has higher implications than the project alone and influences the program of adopting PA.

At the end of each of the group of barriers regarding directors and project teams, a cluster is mentioned that refers directly to the top-down (lack of champions) and bottom-up (not enough motivation/initiation from the project teams) decision of using PA. Consequently both approaches are currently blocked in the organization and therefore no more project alliances have been initiated. By comparing table 1 and 3, it can be observed that there is more consensus on the barriers in group 1 than in group 2, and this was completely expected as group 1 interviewees were all from the same organization and their experience were based on the same project. However group 2 interviewees were from two different organizations and their experiences were based on 3 different projects.

An important finding is the relation of barriers to each other; they cannot be seen as isolated barriers but should be seen as cause-effect barriers, despite not having a strictly causal relation. In other words, the barriers that are connected do affect each other in a causal manner but in some cases this causal effect is not the only reason for the next barrier, therefore not a direct cause and effect relation.

Additionally, by comparing the results of group 1 and group 2 interviews, the following diagram with regard to the common barriers can be illustrated (figure 16). The yellow circles in this diagram show the shared identified barriers between group 1 and group 2 interviews.

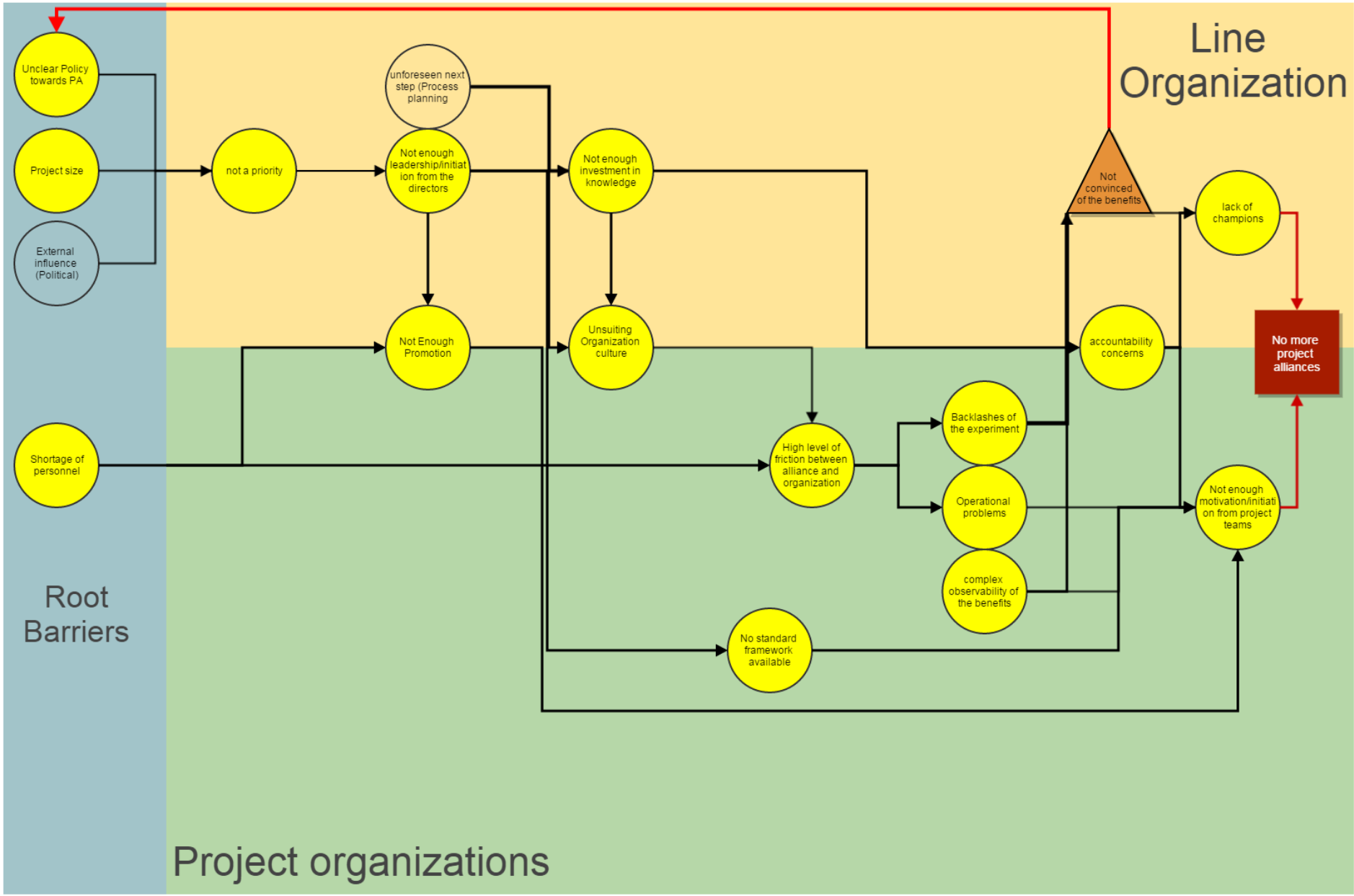


Figure 14 - The shared barriers between Rijkswaterstaat and ProRail/PNH

Interestingly it can be observed that 16 out of 18 barriers identified in Rijkswaterstaat are also observed in either PNH or ProRail. Separately comparing, the following statements can be said:

- RWS and ProRail have 14 similar barriers
- RWS and PNH have 9 similar barriers
- PNH and ProRail have 8 similar barriers
-

However it should be noted that the barriers for adopting PA in PNH are more significant than what is resulted from this research. This is due to two facts:

1- No internal personnel of PNH was ever involved in the alliance team to be eligible for interviews (both interviewees from PNH were hired personnel), therefore the investigation for barriers were relatively shallower.
2- PNH is not even considering adopting PA, at least for the time being.

As a result it is not expected that PNH would have another PA in the next years, unless due to very special circumstances. But for RWS and ProRail, more experiments with PA in the next years are expected.

Additionally it should be noted that RWS and ProRail are organizationally more similar to each other than to PNH (PNH is smaller, more local organization with less and smaller projects; and has some different regulations overseeing it).

The green circles in figure 17 illustrate the barriers identified by group 2 but not in group 1 interviews.

The following statements can be said about the similarity of the barriers between these three organizations:

1- Unsuitable project size as a barrier is shared between RWS and PNH, but for the former it is due to large project scopes and for the latter due to small project scopes.

2- Policy as a barrier is shared between RWS and PNH, but for the former it is due to lack of clarity in this regard, and for the latter the policy is lacking entirely.

3- Despite the fact that external influences are mentioned as barriers for both RWS and ProRail, they refer to completely different type of barriers; for the former it is due to political influences and for the latter it is due to the influence of other stakeholders of the project. Thus they are not considered similar.

4- Shortage of personnel is identified as a barrier for all the three organizations and all 17 interviewees have acknowledged this barrier. This appears to be mainly due to governmental cutbacks of the past recent years.

5- Not a priority as a barrier is shared between RWS and ProRail, except the root barriers connected with this barrier, too many changes, and other developments in the organizations can be seen as affecting factors.

6- Not enough promotion of the concept is identified as a barrier in all three organizations.

7- Not enough investment in knowledge is also identified as barrier in all three organizations. The lack of knowledge is seen as one of the most important barriers ahead of PA with all 17 interviewees acknowledging it. Furthermore, it is observed that the project teams involved in PA have quite different definitions for it, not only between different projects but also within the same project. Additionally 4 of the interviewees from RWS and 3 of the interviewees from ProRail did not acknowledge the approach of the other organization as a “real PA”.

8- Not suitable organizational culture is also shared between all the three organizations, the main difficulty in this regard is the control vs. trust issue.

9- High level of friction between the alliance and main organization is also shared between all the three organizations. Despite causing many problems in the PA experiences, it appears that no attention has been given to this barrier throughout the years, since in the last experience of PA in the Netherlands, OVSAAL project, this barrier is as significant as it ever was, if not more.

10- Backlashes of the experiment and complex observability are both identified in all the three organizations.

11- The only barrier shared between PNH and ProRail but not RWS is “no systematic development process”.

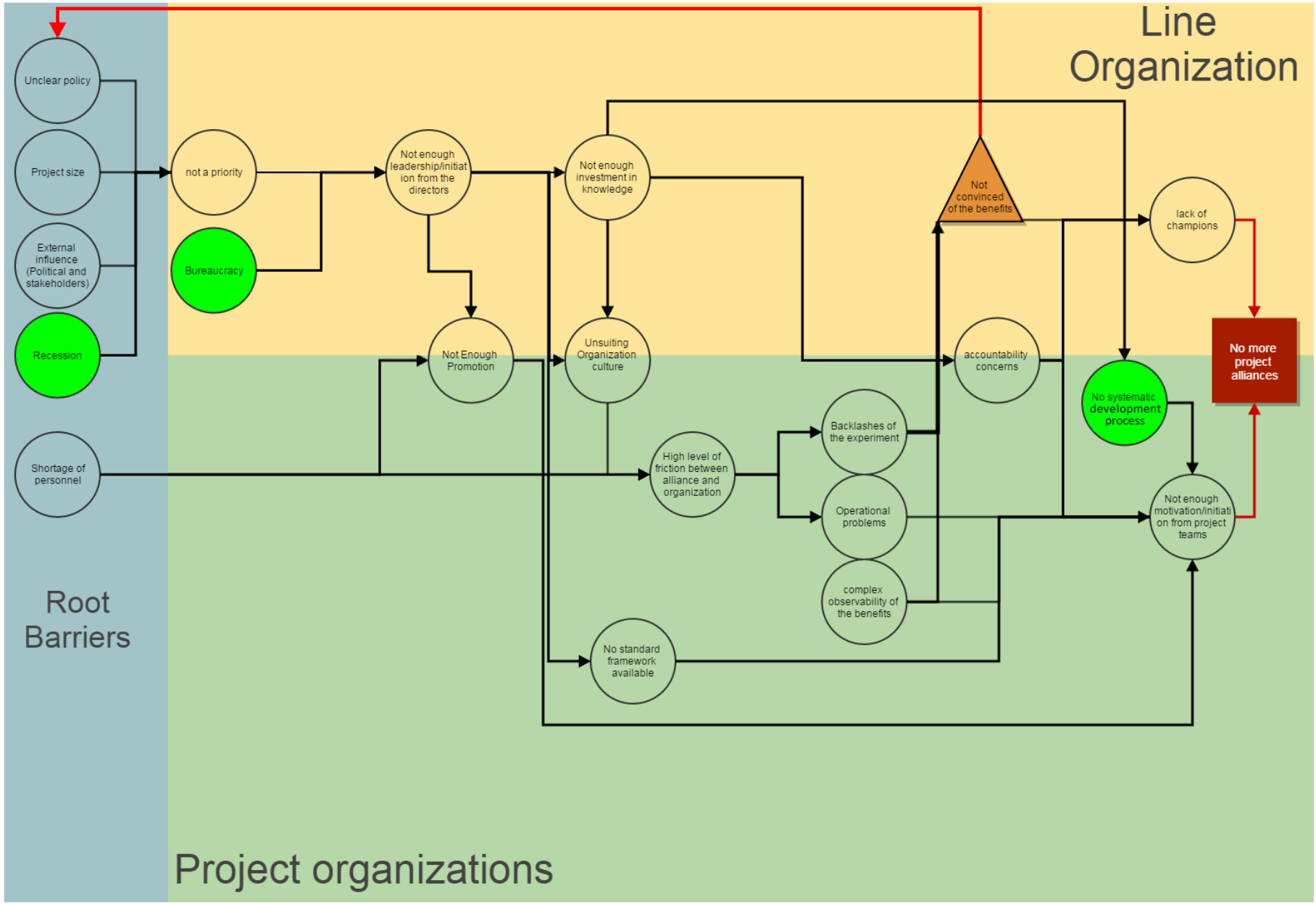


Figure 17 - The barriers exclusive for ProRail/PNH

5.4 Validation round

In the validation round, the results of the interviews were presented to the directors and decisive functions for the adoption of PA within Rijkswaterstaat to firstly investigate whether the identified barriers are recognizable for them or not, and secondly to include their observations with regard to the barriers. For this purpose, 12 eligible interviewees were identified from which the results of 10 interviews were used for the validation round; one interviewee not being able to participate within the data gathering period of the research and the results of another interview having a different focus than the studied transportations sector. Therefore the results presented below are based on 10 interviews in total. In addition to the barriers from group 1 interviews, the barriers identified exclusively from group 2 interviews were also included in the validation round in order to survey if those barriers are also relevant for Rijkswaterstaat. The 10 interviewees of the validation round had the following diverse functions in the organization:

- Chief engineer and director
- Director of procurement and contract management
- Director of production and project management
- Head of innovation and market department
- Head of infrastructure procurement department
- Strategic advisor
- Director of Operations and procurement
- Project director
- Senior advisor (x2)

Table 5 (page 104) demonstrates the result of the validation interviews and whether an identified issue was recognizable for the interviewee as a barrier for adopting PA in Rijkswaterstaat.

For each of the barriers investigated in the validation round, the interesting and informative quotes by the interviewees are briefly mentioned in appendix 10. These remarks can provide better insights about the perspective of the interviewees with regard to the barriers.

Table 4 - Validation round results

Interviewees / Barriers	Interviewee #18	Interviewee #19	Interviewee #20	Interviewee #21	Interviewee #22	Interviewee #23	Interviewee #24	Interviewee #25	Interviewee #26	Interviewee #27	Total # of interviewees recognizing the barrier (out of 10)
Barriers from group 1 interviews											
External influences	✓	-	✓	✗	✗	✓	✓	✗	✓	✓	6
Lack of clear policy	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	9
Unsuitable project sizes	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	0
Shortage of personnel	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓	3
Not being a priority	✗	✓	✓*	✓	✓	✓	✓	✓	✓	✓	9
Unforeseen next step of the experiment	✗	✓	✓	✓	✗	✓	✓	✓	✓	✗	7
Not enough initiation/leadership from the directors of line organization	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	9
Not enough promotion	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Not enough investment in the knowledge of the organization	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Not suiting organizational culture	✓	✗	✓	✓	✓	✓	✓	✓	✗	✓	8
High level of friction between the alliance and the main organization	✓	-	✓	✓	✗	✓	✓	✓	✓	-	7
Backlashes of the experiment	✗	-	✗	✓	✗	✗	✗	✗	✓	✓	3
Operational problems	✓	-	✗	✗	✗	✗	✗	✗	✓	✓	3
Complex observability of the advantages	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓	8
No standard framework	✗	-	✗	✗	✗	✓	✓	✗	✓	✓	4
Accountability concerns	✓	✓	✓	✓	✓	✓	✗	✓	✓	✗	8
Not enough motivation/initiation from the project teams	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Lack of champions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Barriers exclusively from group 2 interviews											
Recession	✗	✗	-	✓	✗	✗	✗	✗	✗	✓	2
Bureaucracy	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	0
No systematic development process	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Sum of recognized barriers	12	11	15	15	10	15	13	13	16	16	

* the interviewee believes this is the case for road infrastructures but not for water infrastructures

As it can be observed from table 5, there is consensus on some of the investigated barriers. However in order to categorize the barriers for identifying the most recognizable and unrecognizable barriers, and due to relatively low number of the interviewees, the following thresholds are suggested by the author:

10 ≥ # of barriers recognized ≥ 7	Majority consensus on being a barrier
6 ≥ # of barriers recognized ≥ 4	Disputed barriers
3 ≥ # of barriers recognized ≥ 0	Majority consensus on not being a barrier

As a result of the above thresholds, the investigated barriers are categorized as below:

Table 5 - validation round barriers categorized according to repetition

Majority consensus on being a barrier	Disputed barriers	Majority consensus on not being a barrier
• No clear policy towards PA • Not being a priority • Unforeseen next step of the experiment • No systematic development process • Not enough initiation / leadership from the directors of line organization • Not enough promotion • Not enough motivation / initiation from the project teams • Complex observability of the advantages • Lack of champions • Accountability concerns • Not enough investment in the knowledge of the organization • Not suiting organization culture • High level of friction between the alliance and main organization	• External influences • No standard framework	• Unsuitable project size • Shortage of personnel • Backlashes of the experiment • Operational problems • Recession • Bureaucracy

According to table 7, it can be observed that between the directors, there is relatively a good agreement on the barriers; with 13 barriers categorized as majority consensus on being a barrier, 6 barriers categorized as majority consensus on not being a barrier and only 2 barriers categorized as disputed or no apparent consensus. This shows that the perspectives of the directors are more or less aligned towards the studied issues. Yet it is also evident that for an important potential barrier such as external influences, there is no clear dominant opinion.

By considering the results of the validation round (section 5.4) and the findings of group 1 interviews (section 5.1), two changes are to be applied to the identified organizational barriers for adopting PA in Rijkswaterstaat:

1- A new barrier has been added; “no systematic development process”, as it was only identified by the external project personnel (group 2, section 5.2) yet interestingly in the validation round it was acknowledged as a barrier by all of the interviewees.
However there is a logical explanation why the internal project personnel did not diagnose this barrier; for recognizing the aforementioned inconsistency, a single project cannot be used, rather more project assessments or experienced are needed. In ProRail, with three experiences, the project personnel were aware of this inconsistency, but the project personnel in Rijkswaterstaat were basing their perception on a single project. However the directors in Rijkswaterstaat had a broader view since more projects were considered to be realized via PA, despite that they eventually did not go through.

2- The barrier “unsuitable project size” was removed as with the provided argumentations during the validation round (appendix 10), due to three main reasons this barrier is not relevant; firstly Rijkswaterstaat has many different projects with quite varying scopes and sizes, thus even if relatively smaller projects are appropriate for PA there are still a considerable portion of projects in this range. Secondly project alliancing does not have to be applied for the entire project, so even for the very large projects, PA can be applied to a sub-project that is complex due to its risks and uncertainties. And finally, project alliancing can also be used for large projects (in their entirely), as there are international examples available for this (such as the Stafford rail project in England, East Spar Gas Field alliance, water treatment project in Australia and etc.)

6. Conclusion

For this thesis, the following research question was designed:

"What are the most critical organizational barriers for progression of project alliancing from an experimental tool to an effective project delivery system for Rijkswaterstaat as a public entity?"

This question has three sub questions embedded in it:

1. What is project alliancing?
2. What has already been done in the Netherlands with regard to PA?
3. What are the potential (theoretical) organizational barriers for adopting PA?

In this chapter, the answers to these questions will be given in brief to serve as the conclusion of the report.

1- What is project alliancing?

Project alliancing (PA) is a form of relationship contracting which is developed as a response to the challenges of realizing complex construction projects. It is the only form of relationship contracting that is considered to be a full project delivery method by many scholars (Ross 2003, Mills & Walker 2012, Lahdenperä 2012, Plantinga & Dorée 2013). Even though a single specific definition for PA cannot be agreed on by the scholars, this author suggests the use of the following working definition in order to avoid confusion with regard to this concept:

> Project Alliancing is a **project delivery method** based on a **joint contract** (legally binding), involving the **key public and private actors** respectively as **principal and agent, as early as possible in the process** for a **single project** whereby the parties assume **joint-responsibility** for the design and construction of the project to be implemented through an **integrated project team** and **joint organization** (not a legal entity), and where actors **share both positive and negative consequences** via a **pain/gain sharing mechanism** that **aligns their commercial interests** and **ties it to the end result of the project**, thus is founded on the basis of **best for project attitude** and aims to create a **win-win situation** through **optimized teamwork** and **proper platform for the development of soft skills**.

2- What has already been done in the Netherlands with regard to PA?

In the Netherlands, project alliancing is relatively a new concept. In the Dutch infrastructure sector, only 5 projects have been realized via project alliancing; the first one started in 1999 and the last one still being in the implementation phase. In the meantime, after 15 years and a number of successful experiments, still no public entity in the Netherlands has been able to adopt PA.

Another observation with regard to PA in the Netherlands is that the model being used cannot be considered a full project alliancing, rather a project 'design' alliancing. This is due to the fact that only the design, stakeholder and surrounding management is placed in the domain of the alliance.

3- What are the potential organizational barriers for adopting PA?

Despite extensive research, it appears that no literature addresses the potential organizational barriers for adopting PA. Thus to answer this question, 4 categories were created in order to provide a multi façade approach regarding the theoretical barriers of a process innovation that possibly requires some changes in the organization; (1) utilization of research, (2) applying and diffusion of innovation, (3) organizational change and (4) barriers to adopting PA. The following potential organizational barriers for adopting PA were found as the result of the literature study:

Table 6 - The theoretical barriers for adopting PA in an organization

Category	Theoretical Barrier
1. utilization of research	1. [lack of proper researching] 2. **[Policy vacuum]** 3. [Ritualistic behavior] 4. [Research deficiencies] 5. [lack of actionable outcome/steps]
2. applying and diffusion of innovation	6. **[Not enough initiative from the directors]** 7. [insignificant relative advantages] 8. [incompatibility] 9. [high complexity] 10. **[complex observability of the benefits]** 11. **[backlashes of the experiments]** 12. [an isolated innovation department]
3. organizational change	13. [resistance to change in the industry] 14. [resistance due to interests, values and norms] 15. [Long era of past success causing resistance] 16. [Unfitting organizational culture, risk averse culture, etc.] 17. **[Path-dependent development]** 18. [Short-term thinking]
4. barriers to adopting PA	19. **[Lack of Knowledge and skills]** 20. **[improper planning]** 21. [lack of top management support] 22. **[lack of client's initiative]** 23. [lack of real commitment] 24. **[accountability concerns]** 25. **[control vs. trust]**

In the table above, the 10 theoretical barriers that are in bold, are closely related to the identified barriers in Rijkswaterstaat.

4- What are the (most critical) organizational barriers for progression of project alliancing from an experimental tool to an effective project delivery system for Rijkswaterstaat as a public entity?

The organizational barriers identified in Rijkswaterstaat for adopting PA are listed below. However since these barriers are not isolated, figure 20 (page 113) is provided to show their relationship with each other. It should be noted that the connections between the barriers shown in figure 20 are of causal relationship but are not direct cause and effect relation. In other words, between the two connected barriers, the first one is a factor in the causation of the other, however it is not the only cause of the second one.

1. External influences (Political)
2. No clear policy towards PA
3. Shortage of personnel
4. PA is not a priority of Rijkswaterstaat
5. Unforeseen next step of the experiment (process planning)
6. Not enough initiation/leadership from the directors of line organization
7. Not enough promotion for PA
8. Not enough investment in knowledge of the organization
9. Not suiting organizational culture
10. High level of friction between the alliance and the main organization

11. Backlashes of the experiment (the pilot project of PA)
12. Operational problems
13. Complex observability of advantages of PA
14. No standard framework available for PA
15. Accountability concerns
16. Lack of champions
17. Not enough motivation for the project teams
18. No systematic development process

Below a brief explanation of the findings with regard to each critical barrier is provided as conclusion. These descriptions are based on the findings of group 1 interviews (section 5.1 & appendix 7) and validation interviews (section 5.4 & appendix 10).

Barriers	Description
1- External influences	Existence of external influences on the contract choice for projects that Rijkswaterstaat realizes is somewhat disputed (table 2 & 5). If such influences exist then by giving preference to a specific contract type (in case of Rijkswaterstaat, DBFMs) the usage of other contract types will be limited. However almost half of the interviewees, no matter from project team or directors group, see this to currently be a barrier and the other half not. This shows that there is a clear disagreement on this barrier, which could be due to miscommunication in the organization.
2- No clear policy towards PA	There is a majority agreement on lack of clear policy towards PA, from both groups of interviewees. There is also a majority agreement that the instruments used to assess projects for the appropriate contract type in the procuring plan, such as PPC and PSC are quite bias towards DBFM contracts. Therefore for adoption of project alliancing, not only the policy needs to be developed, but also the instruments used should be adjusted to give a fair chance of assessment for other contract types. On the other hand, it is argued that the policy of "DBFM, unless…" has been the case for Rijkswaterstaat in the past, but since about 2 years ago, this policy is being replaced with a less biased policy, yet the perception of the majority of the interviewees (both project team and directors), is that the policy is still quite focused on DBFMs.
3- Shortage of personne	There is a clear division of perceptions between the project team and the directors with regard to this barrier; all the interviewees in the former group recognized this as a barrier for adopting PA, but only 2 out of 10 interviewees from the latter group saw this as a barrier. The project team interviewees were mostly concerned with two issues; the higher amount of work that was required by them and the general feeling of Rijkswaterstaat about not being well-represented in the alliance team due to the misbalance in the number of personnel from the public and private parties. On the other hand, the general opinion of directors is that shortage of personnel quantity-wise is not an issue, however quality-wise there is a shortage.
4- PA is not a priority of RWS	On this barrier, there is a relative good consensus between both groups of the interviewees (project team and the directors). The majority of the interviewees in both groups have the opinion that project alliancing is currently not a priority for Rijkswaterstaat. This is mainly due to the fact that the policy for it is lacking.
5- Unforeseen next step of the experiment	There is a good consensus on this barrier between the project team and the directors. Not having a solid process planning with regard to the pilot project of PA in Rijkswaterstaat is considered as a barrier for its adoption in the organization.

6- Not enough initiation/leadership from directors of line organization	The project personnel interviewees, who acknowledged this barrier, were of opinion that for increase in knowledge via more experience, more experiments are needed. And initiation of directors could create a shortcut for more experiences that would normally be impossible due to other barriers such as the lack of policy. On the other hand, the directors stated two main reasons why the expected initiation is not taken; firstly since PA is not yet a policy of Rijkswaterstaat, taking initiation for it means carrying its risk, and in case of failure they would be seen personally responsible for it (due to the internal politics, instigating a concept that others are not on board with, might have negative consequences.). And secondly it was mentioned that initiation is lacking by the directors because the knowledge about the concept is not enough, thus a vicious loop.
7- Not enough promotion for PA	The majority of the interviewees are of opinion that not enough resources are spent on promoting the concept of project alliancing in the organization.
8- Not enough investment in the knowledge of the organization	This barrier is the only barrier that was recognized by all the interviewees from both groups. The majority of the interviewees have stated that the knowledge for PA should be increased by more experiences, as currently this knowledge is limited to only one experience in all the different levels of the organization, from project teams to the procurement and the directors. Fear of unknown is the main barrier that is placed in this cluster.
9- Not suiting organizational culture	The perception of all the interviewees who recognized this barrier is quite similar and does not change between the two groups. It is generally believed that the main issue with the culture is that due to the distrust between the public and private parties, it is based on a control rather than trust culture.
10- High level of friction between the alliance and the main organization	Two causes are observed for this barrier: firstly the people who stayed in the main organization were working the same way as they had always worked, however the personnel in the alliance team came to their colleagues with different requests. And not being used to such requests caused a tension to be created in the interaction of the colleagues, based on whether they are working in the alliance or in the main organization (figure 18). Secondly, for the public party having significantly less personnel in the alliance team (around 15% of the personnel, vs. the 85% from the private parties - figure 19), contributes to the fact that they consider themselves not being well presented and as a potential threat to their interests. As a result of this distrust between the main organization and the alliance team, the decisions made within the alliance were faced by resistance in the main organization. This in turn not only causes the efficiency opted for by creating the alliance to be diminished, but in an extreme case result in a dysfunctional alliance team.

Figure 18 – The interaction between the alliance team and the main organization

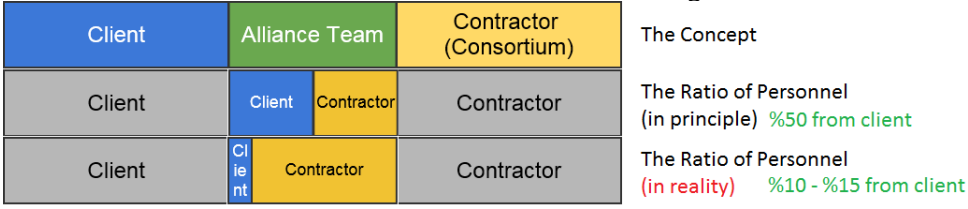


Figure 19 – Comparison of the personnel ratio between the public and the private party.

11- Backlashes of the experiment (the pilot project of PA)	The interviewees recognizing this barrier are of opinion that the glitches of the partnership or the project, which are considered as learning points of the experiment by themselves, could be seen as shortcomings of project alliances in the eyes of the rest of the organization.
12- Operational problems	There are three main concerns with regard to this barrier; (1) the separation of networks in the automation process (due to the accountability issue for the public organizations) and thus inhibiting the parties from a complete integration of the process and databases, (2) the fact that the alliance organization is not a legal entity, which creates its own challenges such as the fact that the payments should go through the main organizations and this assumedly slows the process or limits the flexibility of the alliance. (3) the lack of mechanism for Rijkswaterstaat to keep the financial benefits that were the results of cooperation in project alliancing. As a result of this, Rijkswaterstaat as an organization is lacking the incentive for saving costs, since any costs saved will be returned to the ministry and might even be considered due to inaccurate project cost estimations by Rijkswaterstaat.
13- Complex observability of the advantages of PA	For this barrier, there was a noticeable difference in the perception of the project personnel and the directors; with the majority of the former group not considering this as barrier but the majority of the latter group seeing it as a barrier. Yet all of the interviewees who recognized this barrier saw the difficulty in the connection of the advantages of PA to the hard results of the project. The difference of perception between the project personnel and directors group is logical; project personnel are involved in the project on the more technical level, thus they can observe the benefits in their own domain of activities, however the directors mostly base their perception on the outcome of the project and not the details of the work, which is again hard results. Consequently, the benefits that concern the soft aspects of the partnership such as the development of soft skills, enjoyable work atmosphere and etc. are mostly visible to the project personnel and unless a clear link is observed between the soft factors and the hard results (time, cost, quality), such benefits will not be much visible for the directors.
14- No standard framework (for PA)	From the people who acknowledged this barrier, the concern with not having any standard frameworks was mostly about the increased work load in case of deciding to initiate a PA, as the responsibility of the research and development would fall on the shoulders of the project teams themselves. Carrying such responsibility not only means extra work, but also results in extra accountability, and not having a reference framework makes the accountability of it more substantial in the eyes of the project teams. Additionally by not having a standard framework for a concept such as PA in a large organization such as Rijkswaterstaat, and thus not being a standard procedure, project personnel need to attain many internal authorizations for it. In the case of A2Hooggelegen attaining these authorizations proved to be more work than expected by the people. Therefore to go the extra mile, a very ambitious project team is required otherwise it will not happen.
15- Accountability concerns	This barrier refers to the false concerns that the people might have with regard to PA, such as concerns with regard to violating the governments account act by having project alliances and other regulations. The reason that these concerns are considered “false” is that despite the regulations and the restrictions, implementing PA is still very much possible. However due to the fact that the concept is relatively new and it requires a different approach in the partnership, the perception of people could be that such approach is only possible in very limited cases.
16- Lack of champions	All of the interviewees acknowledging this barrier were of the same opinion that in order to have more project alliances, especially during the experimenting phase of the concept, it is important to have pioneers who are willing to act as the promoter of the concept and are willing to use their own position in the organization to provide support and acceptance for it.

17- Not enough motivation/ initiation from project teams	The interviewees who identified this barrier were mostly of the opinion that the project teams are not convinced of the benefits of PA, thus they are not motivated to initiate it. It is also mainly accepted within the interviewees of both groups that without such conviction, even if the directors appoint projects to be implemented via PA, project teams will do anything in their power to avoid it.
18- No systematic development process	The main concern regarding this barrier according to the interviewees was not having consistent motives for the use of project alliances in different projects. This refers to a systematic development of project alliances within the organization, thus it refers to the management of the concept of PA rather than a single project. In other words, inconsistency in the motives used to promote/initiate PA is seen to act as a barrier.

The objective of this research was to identify the barriers for adopting PA in Rijkswaterstaat. For this purpose two literature studies were conducted; one specifically on what project alliancing is and what has been done in this field in the Netherlands and the other on the theoretical barriers for adopting PA in organizations. Afterwards by means of semi-structured interviews, two groups of public project personnel with experience with PA were interviewed; an internal and an external group. The identified barriers were used in a validation round interview between the decisive functions of Rijkswaterstaat for adopting PA. The end result of the research is based on the aforementioned interviews. The limited number of interviewees is seen as a limitation of this research; with 33 eligible interviews identified and 27 agreeing to participate. However based on having a good mix of different functions and the fact that the research is of diagnosis nature, the author believes that the result are a fair representation of the current situation. With regard to the conclusions, the recommendations for Rijkswaterstaat are presented in the next chapter.

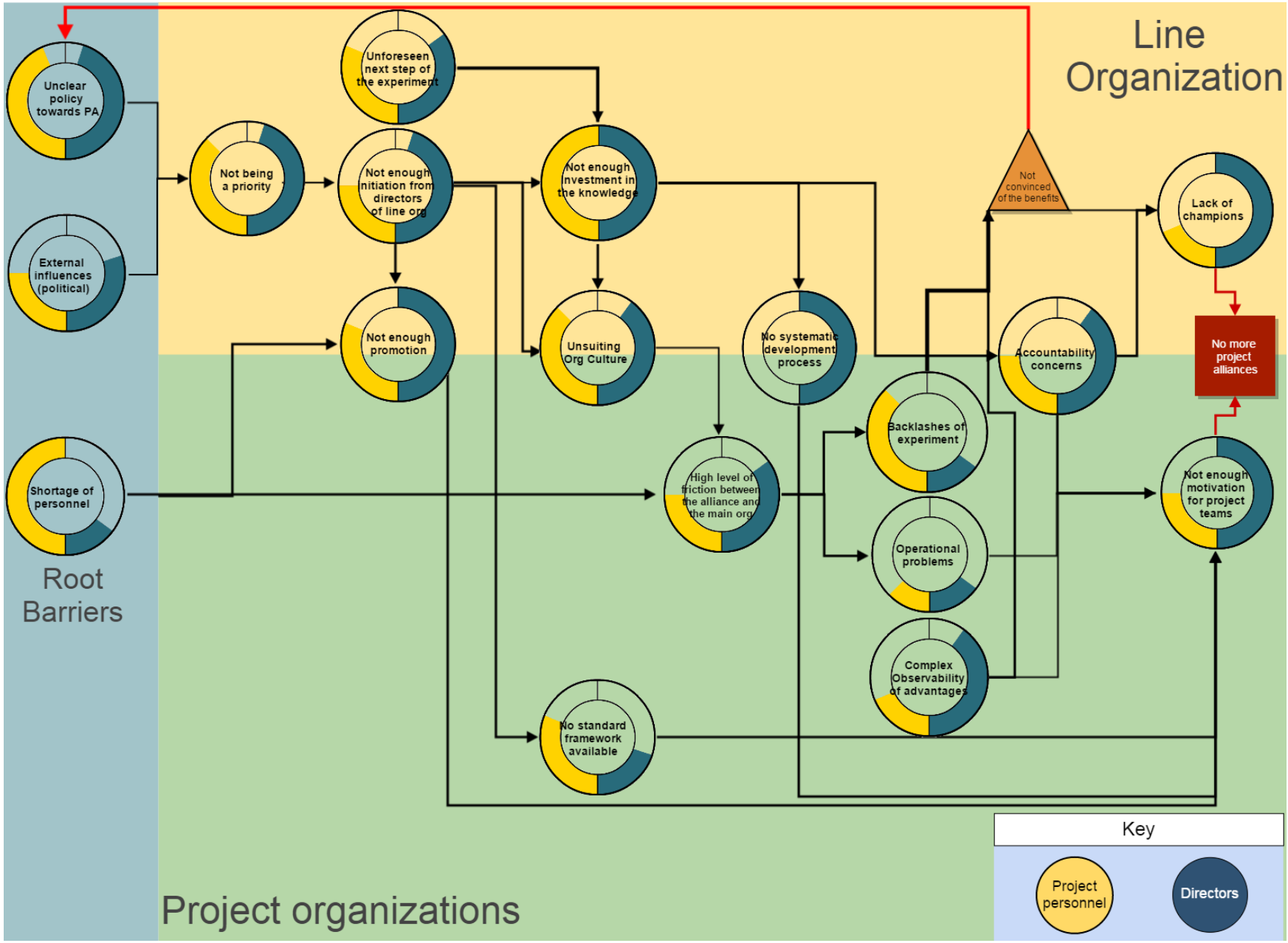


Figure 20 - The organizational barriers for adopting project alliancing in Rijkswaterstaat

7. Recommendations

With regard to the results of this research, the following recommendations are given to Rijkswaterstaat, the interested parties and to any other public organization looking to adopt project alliancing in their practice. The recommendations are divided into 3 different categories; general recommendations, recommendations regarding the barriers and recommendations regarding further studies. Finally a 3 step plan, based on the results of the research and as the priority for the removal of the barriers is suggested.

> "Past is **experience**, present is **experiment** and future is **expectation**. Use your **experience** in your **experiments** to achieve your **expectations**!" (Anonymous quote)

General recommendations

- For adoption of PA, it is advised to use a unified definition for it in Rijkswaterstaat. This unified definition does not need to be specific (and thus limiting), rather it serves as a general outline to ensure that there is consensus on the concept referred to. The author suggests the working definition presented in section 3.1.3 of this report.

- The barriers that are only observable by one group of the interviewees (project personnel or the directors) should be discussed and made clear. Such barriers are either not observable by some of the interviewees due to their domain of activity, lack of information or even due to the "extra" information that they might have and results in seeing such barriers insignificant or ineffective. Since some of the barriers could only be misconceptions, they can become less significant by adding new perspectives to it.

- As tacky as it sounds, clear communication is the key to aligned organizational effort. Any mixed-signals could lead to wasted efforts and resources. It appears for the case study organization; a clear agenda with regard to PA is still lacking, or is not communicated correctly through the organization.

- Despite the shortcomings of project 'design' alliancing compared to full project alliancing, it is recommended not to include the execution risks in the alliance domain. It appears that including the construction in the alliance domain is not beneficial for the public organizations as due to cutbacks, the expertise of such organizations are restricted to the design and surrounding/stakeholder management.

- Adopting project alliancing should be seen as adopting a new option for project delivery. It should however not be considered as a replacement for other already adopted PDM's (e.g. DBFM). Each PDM has their own advantages and the choice on which one to choose should be based on a fair assessment with regard to the project characteristics.

- For the adoption of PA and achieving full benefits, a collective organizational endeavour on different levels is required. However it is expected from the directors and top managers to lead the way and initiate the required movement.

Recommendations regarding specific barriers

- **External influences:** The disputed barriers (table 6), especially the external influences should be discussed between the directors in order to avoid a "freezing state" for adopting project alliancing. The results of this discussion should also be communicated to the project organizations and personnel, as it appears that currently there is little knowledge with regard to such influences but yet there are concerns about it.

- **Not suiting organizational culture:** Public organizations cannot aim for project alliancing approach if their culture and policy is yet focused on having full control over the projects. Therefore for successful adoption of PA, it is important to ensure that the right culture and policy is formed in the organization.

- **No clear policy towards PA:** If it is not a policy of the organization to have PA, its development will not receive any attention, thus the capacity and instruments required for it will also not be considered. As a result, its development will not be on the organization's agenda thus logically it will not happen. Therefore it should become a policy first, and the policy is made top-down not bottom up. It is a strategic decision that should be made by the directors (line organization) and the policy makers.

- **High level of friction between the alliance and main organization:** A healthy level of friction can be seen constructive between the alliance and the main organizations as it will ensure that the interests of parties are being safeguarded. However excessive friction not only results in a dysfunctional alliance team but also leads to more problems for the delivery of the project which in turn would harm the interests of parties. One way to ensure that the friction stays on a moderate level is to have personnel with the right mentality and understanding of project alliancing as counterparts of the alliance team in the main organization.

- **High level of friction between the alliance and main organization:** Due to limited experience, it is advised that in the experimenting phase, more personnel to be provided in the alliance team from the public sector to not only increase the learning opportunity, but also to avoid problems such as high friction between the alliance and main organization. But with more experiences and availability of experienced personnel, project alliancing would actually require less number of personnel than the conventional contracts due to elimination of redundant roles (by creation of an integrated project team).

- **High level of friction between the alliance and main organization:** It is important for the alliance organization to create their separate identity from the main organizations; however it is also important for the alliance team to avoid creating a distance with the main organization from the beginning. Otherwise this distance could cause lack of trust, support and commitment from the organizations, especially in the experimenting phase as the concept is relatively new and challenges the conventional practices.

- **Shortage of personnel:** It is strongly advised to include other key public stakeholders in the alliance as well. PA in the Netherlands is mostly considered for projects with complex surrounding and stakeholder management, and public organizations such as Rijkswaterstaat and ProRail usually have to work with the local and regional public organizations (such as the municipalities and the provinces) to deliver their projects, thus by including such public parties in the alliances, not only the potential problem of shortage of personnel from the public parties will be solved but also the cooperation can become more effective in furthering the project goals.

- **Not enough investment in the knowledge of the organization:** As it is anticipated that only a fraction of Rijkswaterstaat's projects are 'complex' enough to benefit from project alliancing, it is not necessary for the whole organization to be involved with this concept. Rather as any other competency, it is advised to invest in the knowledge of required number of personnel with regard to the projected number of projects that could be realized via PA in the future.

- **Not enough investment in the knowledge of the organization:** The organization should not be inhibited from more project alliances due to the lack of knowledge; the required how-to knowledge can only be increased through more experiences. Proper management of the learning process is thus crucial for successful adoption of a new concept; for example a good flow of experiments could ensure a continuous learning opportunity. However experiments should be conducted with clear motives and planning according to their potential outcome.

- **Accountability concerns:** The accountability concerns must be clarified; are these concerns real or misconceptions?

- **Not enough promotion for PA:** Having an alliance leadership champion team (ALCT) would ensure an enhanced development and adoption process for project alliancing within an organization. ALCT should consist of people who have more experience with PA, and will not only promote project alliancing within the organization but also run interference through the organization and regulatory bodies, allowing the alliance management team to focus on day-to-day delivery.

- **Not enough promotion for PA:** Benefits of PA should be observed, proven and emphasized for its promotion in the organization. Such promotions should be done by the different levels of the organization, but the innovation department plays a central role in this regard.

- **Not enough motivation/initiation from the project teams & not enough leadership/initiation from the directors:** Internal politics in the public organizations (or any large organization) are common. This internal politics can cause the personnel not to risk their positions by taking initiative for new concepts. Thus it is important for the personnel to be motivated and encouraged to take initiation for concepts that are considered to have potentials for the future. Even if there is a chance of failure in the short-term.

- **PA is not a priority of Rijkswaterstaat:** If PA is currently not the priority of Rijkswaterstaat, but could be in the future, it should be planned from now what has to be done for it to be successful in the future.

- **No standard framework available:** Having standard frameworks is not necessary in the experimenting phase; rather the frameworks will be developed from the experiments. Thus saying we cannot experiment since we don't have standard frameworks is not acceptable. However developing such standards are seen important for the adoption of the concept. These frameworks are to be developed by the procurement department and based on the experiences of the project personnel.

- It is important for the project personnel to have enough room in the experiment projects and for a successful experiment; the mandates for experiments should give the project teams more flexibility than the routine tasks. With inadequate mandates, the alliance team has to get back to the organization more often than intended. However directors and higher

managers should also be more involved in the course of the experiment projects as their implications affects the organization much wider than the project itself.

- A mechanism for creating motives for cost saving is required in the public organizations. Rijkswaterstaat is not an organization working for financial benefits, and whether there is cost saving or cost overrun, the personnel will not see the consequences of it. Additionally the difference in project cost is to be returned to- or provided by the ministry. Thus only the predictability of prices is important for RWS and there is a lack of incentive to save costs.

- PPC and PSC should be reconsidered since they have great bias for DBFM. More neutral figures should be used from the experiences gathered to ensure a fair assessment of the contract forms for projects.

- Assessment of projects for the use of PA should be done with good argumentations.

- Alliance leadership team should be more involved in the activities of the alliance and act as a buffer zone between the alliance team and the main organization. This role should not be seen as a formality or just an escalation level.

Recommendations regarding further studies

- The barriers identified should be discussed more in the organization to investigate their true significance and consequences. A round-table discussion between the concerned functions is advised as the first step towards this investigation.

- It is recommended for Rijkswaterstaat to also conduct a research on the potential drivers for adopting project alliancing; as such research will help to acquire a better overview of the topic.

- As there are possibilities of more experiments with PA in Rijkswaterstaat, it is advised that the researches regarding the development and adoption process of PA to also be conducted in different phases of the experiment (as it is the case for evaluation researches).

- Due to the fact that a large portion of the discovered barriers are similar between Rijkswaterstaat and ProRail, it is advised for these two organizations to share more of their knowledge with regard to the experiences. This sharing of knowledge should not only be for the projects, but also for the development and adoption process of PA.

A 3 step plan (actionable outcome based on the identified barriers)

1. The first step in overcoming the barriers for the adoption of PA in Rijkswaterstaat is to focus on the root barriers; As it can be seen from figure 20 (page 113), there are three root barriers; unclear policy towards PA, external influences and shortage of personnel. This has to begin by investigating the true external influence on the choice of contractual models by Rijkswaterstaat. If such influences are real and defining, convincing the politicians of the benefits of PA would be the priority for its adoption. However if the influences are misconceptions, it should be clarified and effectively communicated through the organization.
2. Afterwards the focus should be on the policy of PA in Rijkswaterstaat; without the appropriate policy, any endeavor for the application of PA will be faced with complicated authorization procedures. It should be determined if Rijkswaterstaat is indeed planning to

develop such policy, and if so, it should be placed on the future business plan of the organization.

3. In order to overcome the problem of shortage of personnel, it is advised to include other public stakeholders in the alliance. Since Rijkswaterstaat is usually representing those parties, including them directly in the alliance will not only bring in their knowledge and shorten the communication lines, it will also aid with the misrepresentation of the public parties.

By removing the root barriers, the appropriate settings for removing the succeeding barriers from figure 20 (page 113), will be created (imagine it more or less as a domino effect). For example by having a clear policy towards PA, it will become reasonable and justified for the directors to initiate another project alliance, thus the knowledge for it will be increased via more experiences and so on. As a result, removing the root barriers should become the current priority for the adoption of PA in Rijkswaterstaat.

8. Author's Reflection

In this chapter, the reflection of the author on the research is provided. This reflection is not only based on the interviews and formal data gatherings of the research, but also on the informal meetings, conversations and interactions of the author during the research period with the subject organization.

With regard to project alliances in the Netherlands, it is observed that all the experiences are based on project 'design' alliance model, rather than a full project alliance. Since the integration of the project is far less in the design alliance compared to a full alliance, the interfaces pose potentially critical obstacles. This makes the partnership between the parties to be more fragile than having a full project alliance. However, since the public organizations appear to lack enough resources and technical knowledge for the execution of the works, including the construction risks in the domain of the alliance seems to have no added value for the time being. Yet if a project is anticipated to have troubling risk interface (between the design and the construction), it is advised to include the construction risks in the alliance domain to avoid a malfunctioning alliance team.

Since identification of the barriers requires looking at the organization through critical glasses, the topic of the research is relatively sensitive. Therefore it was anticipated that the interviewees might not be completely comfortable to raise issues which could have negative consequences for them. On the other hand, the issue of 'blame game' was also considered to be a potential setback of the research. However by the measures taken in the data gathering process, and based on the results achieved, it can be concluded that these potential setbacks have not been a significant issue in reality. The author believes that the majority of the interviewees have been fair critics of the current situation. Yet it is surprising that some of the potential barriers (identified from the literature) were not acknowledged by the interviewees. The author believes that the following theoretical barriers which were not identified in the interviews could be the blind spots of the organization: 'research deficiencies', 'lack of actionable outcome/steps', 'long era of past success causing resistance' and 'lack of real commitment'.

In general it is observed that the despite successes achieved by PA in the Netherlands, public organizations are yet overly-cautious about this concept and its application. This has resulted in a very slow progression of PA in the Netherlands within the past 15 years.

A puzzling issue for the author was the lack of champions for promoting and initiating project alliances. Despite the fact that a large number of people are aware of the benefits of PA, initiating a movement towards it is considered by many to be a challenging task and could raise many conflicting reactions within the organization. During the course of this research, it was implied for the author that the majority of the people are looking forward to more project alliances but prefer others initiating it and being held responsible for it.

Another issue which has been implied to the author was that due to the strong policy of Rijkswaterstaat towards DBFM contracts within the last 10 years, departure of that policy is considered a failure of the organization's efforts. Thus, despite not officially pursuing 'DBFM, unless…' policy anymore, it can still be observed that very little effort has been made for developing other contractual models.

For each project, Rijkswaterstaat receives a budget; any cost underruns will be returned to the financing parties (the ministry and/or the external parties). Therefore the organization is lacking the incentive to reduce project costs since it will not benefit from any cost reductions. As a result, the

author believes that it is necessary to create enough incentive (monetary or nonmonetary) in order for the organization to strive for more efficient partnerships with the private parties. Otherwise there will not be enough motivation to go the extra mile and explore the benefits offered by other forms of partnerships, including PA, which is different than what the organization is used to.

For two of the identified barriers, external influences and accountability concerns, the author is still baffled whether they are real barriers or just misconceptions or excuses for not having more project alliances. It appears that these barriers are perceived to be more critical than they truly are. It is hoped that with the result of this research, more endeavor is put into investigating them.

Another remark about the current situation is the existence of a dilemma for project alliances in Rijkswaterstaat that needs immediate attention; PA is seen to deliver the most added values in projects that are complex in nature, especially in surrounding & stakeholder management (since for technical issues it is considered that the private parties have much more expertise than public organizations). Having a complex surrounding and stakeholder management is due to difference in the interests of parties. One side effect of this difference in interests is that projects are defined to be realized in a specific time period or according to a specific time schedule to limit the project duration. Therefore such projects usually have a defining deadline from the very beginning of their initiation. Since currently there is no clear policy towards project alliances, no reference frameworks and no clear assessment instruments, if such projects are to be realized via PA, a time consuming procedure is required to not only convince the external stakeholders (such as other public organizations) but also to convince the internal functions for the potential added values that PA can have for the project. Therefore, even if the outcome of such procedure is positive for PA, due to having good reasons and arguments, it would usually be too late (according to the project's deadline) to realize the considered project via PA. As tendering and setting up an alliance is much more time consuming than conventional contracts. As a result, even if the project receives approval to be realized via PA, due to the complex and time consuming administrative procedures, it cannot become a PA.

Finally the author believes that with the right measures, Rijkswaterstaat will be able to overcome the identified barriers and successfully adopt PA within the next few years. For this purpose not only more experiments are required, but also a good cooperation with ProRail is recommended and would benefit both organizations.

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Appendix 1 – Shortcomings of currently common partnerships

According to Duren and Dorée (2008) over 80% of projects in Dutch construction industry are tendered in the traditional manner: design, bid and make selection according to lowest bid. Even though in the recent years a growing attention was given to awarding the contracts according to MEAT (most economically advantageous tender) criteria, less attention has been given to departure from conventional delivery systems towards more flexible forms of partnerships. As (Leijten 2009) refers to the work of (Flyvbjerg, Holm et al. 2003) and argues; despite developing methods to increase the manageability of projects and their planning (such as Critical Path Method and Work Breakdown Structure), the track record of complex infrastructure project management has not improved, yet we believe that we are becoming increasingly successful in managing such projects. Furthermore, traditionally projects were seen as assignments that despite being influenced by their surroundings, during the construction period can be considered isolated for simplicity of planning and management. However with the increasing complexity of projects and the environments they are built in, the assumption of isolated projects is naïve thinking. As a consequence, traditional (static) project management is replaced with dynamic project management. As Woolf (2007) explains, every project is a living, breathing organism, often seeming to have a mind of its own. Thus execution schedules, no matter how thoroughly developed or universally endorsed, become obsolete from the very beginning. Thus successful management can be reduced to effective response to dilemmas. In other words, a successful project cannot be achieved by forecasting the process and every possible scenario, but by responding appropriately to the occurrences.

Adversarial Behavior

As Quick (2002) argues, the law of contract and the drafting, negotiation and interpretation of contracts have meant contractual relationships are inherently adversarial. This is due to the fact that the legal system will enforce a legitimate contract according to its terms, even if those terms were unfair or oppressive or caused severe hardship to a party. Because of this strict enforcement, a party could assume he or she was able to further his or her own interests at the expense of the other. It cannot be denied that this attitude towards contracts is radical; however the existence of this mentality to a lower degree should also not be ignored; after all contracts are supposed to facilitate cooperation and not provoke conflict.

Construction industry in different countries exists within an adversarial society (Fenn, Lowe et al. 1997; Kwan and Ofori 2001; Humphreys, Matthews et al. 2003; Phua and Rowlinson 2003). The mentality that contracts unwillingly bring with themselves is not the only reason for adversarial behavior in construction industry, but there are several reasons that contribute to this. Yet since the existence of such behavior between the owner and the contractor can be argued, here it is tried to provide information why the current “partnership” models are not so partnership friendly after all. Nevertheless it should be mentioned that here is not claimed that all the principal-agent relationships are adversarial, rather that the cooperative relationships offered by conventional contracts are bound to be very fragile due to the fact that the foundation they were developed upon are encouraging of adversarial behavior. However true cooperative relationships can be and have been witnessed with these contracts, even though this is mostly the case when the project runs smoothly or the parties are considerate due to other considerations such as future cooperation or dependency.

There are several aspects that should be considered with regard to the emergence of adversarial behavior in the partnerships of conventional contracts; selection criteria, misunderstandings and

different interpretations of the contract, uncertainty and risk interfaces, lack of transparency and openness, conflicting commercial interests.
Even though these reasons for adversarial behavior are all related and have overlap, each of them provides a useful piece of information with regard to the conventional partnership models.

Selection Criteria

The selection of contractor is mostly based on the lowest price in anticipation that due to the competitiveness market, the contractor will submit the fair price. However reliance on market for this purpose has deficiencies that could bring significant negative consequences for the project. Furthermore, based on the market condition, there are two possible scenarios; tenders during buoyant economic conditions when workloads are high for contractors, and tenders during depressed economic conditions when workloads are low for contractors. In the first scenario, having more workload will reflect on higher prices submitted during a tender, which is clearly not in the benefit of the client. In the second scenario, forced by the economic conditions, the contractors are willing to submit such low prices that might not even deliver them any profit. But the consequences of these low prices can be even more severe than the first scenario. Besides cost escalation after awarding the contract and late project delivery, considerable resources from both parties will be spent on dealing with financial claims and disputes during the project. In the past recent years, due to the global economic crisis, the problem of abnormally low tenders (ALTs) has been identified as one of the main causes of cost overruns and a source of conflict in the projects, especially in Europe (Megremis 2013). Such struggles between the client and the contractor will not only create friction between the contractual parties and lead to adversarial behaviors (Hughes, Hillebrandt et al. 2006), but will also cause time overrun and problems with keeping up with the project's schedule. Another side effect of low bidding price is the lack of commitment from the contractor to deliver what is best for the client (Scott 2001). These issues will be further explained in the next section.
One more problem with the commonly used selection criteria is the domination of hard controls. This has caused very little attention to be given to the soft skills of the partners being chosen. As important as hard controls can be for the results, without proper soft skills, the interaction between the parties will not be managed properly, leading to negative consequences on the end result. This means lack of soft skills is negatively reflected in the hard results of the project.

Misunderstandings and different interpretations of the contract

Claims management, changes and dispute resolution have long been a hassle for construction industry (Levin 1998). Two very common reasons for disputes are misunderstandings and different interpretations of the contract. This can even be the case if both parties act completely with good intentions. Still if an appropriate dispute resolution mechanism is not anticipated, the consequence can be very damaging to the partnership. Especially if the dispute is taken to arbitration or worse to the court and the 'losing party' does not get convinced and only accepting the loss due to legal pressure.
Another issue is that the parties in conventional and traditional contracts are more individually focused. They are concerned with their own domain of activities and if any external issue affects their domain, the first step is to seek compensation for it and then search for a solution. This is due to the attitude of isolated responsibilities that the conventional and traditional contracts promote. This attitude combined with any potential misinterpretation of the contract could lead to potential problems for the project.

Uncertainties and risk interfaces

Typically within contracts it is tried to foresee possible outcomes and define a liability for it. However it is not always possible to do so due to uncertainties concerning the projects. Some risks are not even identified and some have interfaces which would raise disagreements if happening. This is specially the case for risks with high financial consequences since none of the parties are willing to

accept them with open arms. Additionally the owner typically aims to transfer as much of the risk as possible to the private parties. This of course is done at an extra cost and sometimes pushes parties to accept risks that they are not in the best position to manage (Ross 2009). Disagreements over these issues can escalate and turn into larger disputes than they need to, harming the relationship between principal and the contractor. Furthermore the delays and extra costs caused by the disputes can have domino effect and continue throughout the project. To put it in one sentence; if a project is tendered with uncertainties, claims and disputes should be expected.

Furthermore, transferring the risks would also lead to increased project cost due to higher insurance premiums which is caused by higher risk contract. All these issues should be factored into the project price.

Another important shortcoming of current partnership models is the ineffective management of dilemma control. Dilemma control, which is considered to compliment risk management, is predominantly a real-time methodology that is implemented during the project life cycle and concentrates on the "small" things that can go wrong in a project. As Woolf (2007) claims, projects are more often, more consistently, and more significantly delayed by the individual or cumulative effect of countless small matters than they are by a handful of major catastrophes. Risk management focuses mostly on major risks, however it is not designed or effective as a management tool for small incidences. Furthermore risk management is a calculated, planned and structured program but dilemma control is a flexible program that focuses on the ability of project teams to respond, in a timely and effective manner, to the sudden appearance of unexpected and typically minor dilemmas. Such minor dilemmas are difficult to define precisely but in general they refer to situations that require a choice between different options, all of which are mutually exclusive or appear equally unfavorable. Despite being called minor issues, they might have significant consequences for the project; therefore the term minor should not be confused with "unimportant". In current partnership models, dilemma control is mostly done by one of the parties, mostly the contractor; however the consequences affect all the stakeholders.

Lack of transparency and openness

This can be considered as one of the main roots of adversarial behavior within the construction industry. If there is not enough transparency, the parties would suspect opportunistic behavior from their counterparts. This suspicion can start as early as the tendering phase. By assuming the other party might be using some information strategically against their counterparts, the seed for adversarial behavior is already planted. An example can be the typical problem of contractors submitting low price to get the job and asking for additional/extra work payments during the project, by not revealing its practical knowledge until deep into the project and secured its position as the contractor. Or the client pressuring the contractor for what rightfully should be allocated to it but due to the suspicion of opportunistic behavior is being denied. These examples are just the tip of the iceberg when it comes to possible opportunistic behaviors due to the lack of transparency. This will cause the parties not to have enough trust in their so called 'partners', and as it will be explained below, consequently 'collaboration' will lose its meaning and resources will not be used efficiently.

Conflicting commercial interests

It should be noted that the commercial interests of parties have been specifically differentiated from their corporate social interests (stemming from their corporate social responsibilities) in this research. Since the latter is supposedly aligned between the parties in case we do not consider the commercial aspects (e.g. satisfactory level of quality, safety, functionality, legitimacy and etc.; these interests are mostly aligned and shared between the parties, resulting a positive sum game without the financial considerations). However their commercial interests are mainly opposed to one another and is considered to be one of the main sources of poor performance (Scott 2001). On the one hand, it is necessary for each project to be a temporary collaboration between the parties hence benefiting

from a healthy competition among the private parties active in this sector. On the other hand, this tough competitive nature would encourage the private parties to compensate for their low bidding price by seeking and taking advantage of potential loopholes in the collaboration with the client (ProRail 2011) and sacrificing client's best interest for their own financial interests. This is due to the fact that once the contract is awarded, the two parties have different commercial interests and even by use of incentive/punishment methods in the contracts, the contractor could still take advantage of strategic use of information due to the lack of transparency in these partnership models for its own financial benefit. As a conclusion, the classic case of principal-agent problem occurs; when due to different interests and asymmetric information, the principal cannot directly ensure that the agent is always acting in its (the principal's) best interests. The balance sheet of the project is separate for each party thus the effort is to keep their own balance sheet positive, even if this means seeking excuses for compensation by other parties.

This causes the clients, which in the case of LIPs are mostly public sectors, to spend most of their resources allocated to the project on monitoring and supervision purposes rather than adding value to the actual project. Meaning the client's capability is not being utilized efficiently. To explain this further, conflicting commercial interests as forced by the selection method, mechanism of current partnerships and the fact that the loss from one party can be the win for the other has led claims to be used an instrument to avoid losses even for other reasons than the subject being claimed for. Such that it has been seen in many cases, that as long as the commercial interests of the contractor is safe, they are willing to compromise on the claims with a cooperative attitude.

In the conventional contracts, finding a mistake from the task done by the other party is usually followed by an opportunistic behavior. Client and contractor often see an opportunity to gain from the mistakes of one another. This also applies for the individual contractors and sub-contractors. This is usually done by instituting claims due to adverse effects another party's performance had on their task. Despite these claims sometimes being perfectly valid, they are not the efficient solution for solving these problems. Not only the resources are not being utilized efficiently in lengthy claim processes, and it would usually mean project will be halted until the claim is settled, but it means that there will be an extra cost for the underperforming party in order to correct their work, something that might have been avoided by better and earlier communication between the parties.

Furthermore the client is facing the control-trust dilemma (Thijhuis 2004; Man and Roijakkers 2009), on the one hand it needs control to safeguard its own interests in the project and on the other hand trust plays an important role in development of soft skills between the parties and improvement of performance (Bijlsma-Frankema and Costa 2005). But having a conflicting commercial interest makes the balance to tilt towards control rather than trust.

"tug of war" relationship

As a conclusion in the transactional relationships, the parties are considered to be on the opposite sides of the table; the loss of one party can benefit the other. The more one party can squeeze out of the other, the better deal they've got. And having the upper hand in the negotiations usually means misusing such power. This relationship can be compared to a tug of war game, were each party is pulling the rope to their side to safeguard their own interests. Even if this game ends with an equal result, the resources spent to overcome the other party's opportunistic behavior are not put to the best use. The adversarial relationship that unwillingly comes due to the inappropriate partnership platforms, can contribute to poor project performance (Black, Akintoye et al. 2000; Humphreys, Matthews et al. 2003; Meng 2011). As Suprapto, Bakker et al. (2014) explain, under adversarial relationships, owners are more likely to challenge requests for approval, force compliance by withholding funds, and overly control the contractors' works. Meanwhile the contractors might exploit potential claims by aggressively negotiating change orders and withholding vital information. This can cause even the small issues to be easily escalated into major disputes.

Furthermore it has been observed that fragmentation in the construction process could result in more conflicts due to the higher number of interfaces it creates between the different parties (Tijhuis and Maas 1996). And as explained by Rahman and Kumaraswamy (2004), reintegration of this fragmented industry is necessary for improving the project performance and partnerships. As a consequence a growing attention was given to reintegration of construction process in the past decade; however what can be observed is that this reintegration has occurred at the cost of less involvement of the client, with the use of DBFM or D&C contracts. On the other hand, the client's involvement in the process not only ensures that the interests of the users are being safeguarded but also will facilitate a smoother process by pooling of the resources, knowledge and expertise. Therefore an optimum project delivery method should not only enable integration of construction process but also provide the opportunity of informed involvement for the client.

Lack of/insufficient soft skills development in project teams

Despite sounding alike at the first instance, there is a significant difference between the two terms; 'team' and 'group'. A number of people working together can be considered a group however they are not necessarily a team. For being a team, effective integration and coordination and also the existence of soft skills are required. Keeping this distinction in mind, it can be argued that many of the 'project teams' in construction industry are actually just 'project groups'. Thus it is logical that these project groups do not perform as efficient and effective as they are expected.

In the past recent years a significant attention was given to the development of soft skills, not only within organizations but also between the different parties involved in a project and how these skills can improve the performance of construction industry (Hager, Crowley et al. 2000; Grisham and Tijhuis 2007; Spang 2011; Rijkswaterstaat 2012).

An important issue with regard to the soft skills in project teams is the fact that the term 'soft skill' can be seen as an abstract notion, with a touch of vagueness to its exact meaning. This vagueness has caused such difference in the interpretations of soft skills that nowadays on the one hand the answer to almost every problem in construction industry is the development of soft skills and on the other hand every project is considered to be flooded with soft skills, yet our problems have not yet been solved. Thus not only the definition of soft skills is important, but the actual implications of different soft skills are also of great importance. Getting into the details of soft skills is out of the scope of this paper. But in this research, soft skills are defined as the skills relating to social interactions between the individuals (from both principle and agent) that contribute to increased teamwork and improvement of relationships, which is believed to improve the project performance (Larson 1995; Drexler and Larson 2000; Meng 2011).

The positive effects of improving soft skills between the parties are recognized, however this attitude is not fully supported with the current widespread contractual models, therefore not being as effective as anticipated in its translation to hard results in the projects. What is now experienced in the construction industry is a sharply increasing number of proposed means to facilitate the soft skills within projects; though promising in theory, proved to be much more difficult to achieve in reality. Soft skills are about the people themselves and their relationships with each other. To embed soft skills in people involved in a project, the appropriate psychological foundation needs to be provided (DTF 2006). The main barriers in conventional partnership models for this psychological foundation are the fundamental misaligned commercial interests of parties (Scott 2001; Ross 2003; DTF 2006) and the absence of transparency, thus the fear that the other party might engage in opportunistic behavior (Johnston and Lawrence 1988). This causes trust, which is an important driver of soft skills development in projects, at the very best to be established between the parties quite far into the project than it should have been, thus lessening the potential benefits. Furthermore it is generally believed that a balance between soft skills and hard contractual clauses would provide the optimum condition for partnerships (control vs. trust/interaction) (Hertogh, Baker et al. 2008), however this balance should not be seen as a struggle between soft and hard skills, but instead the hard

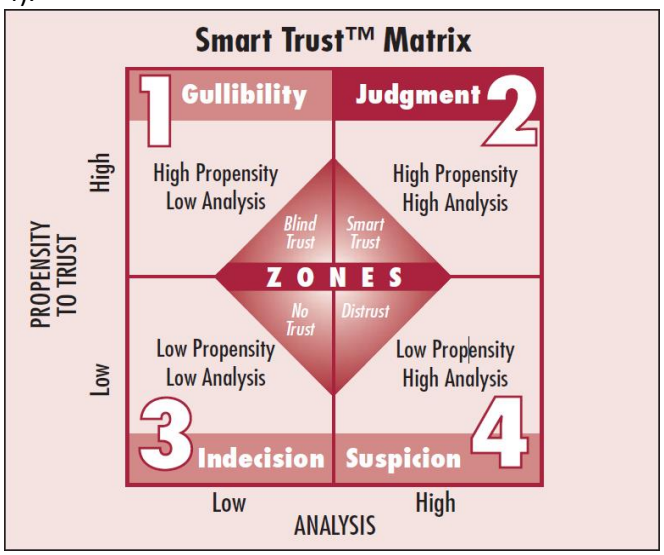
contractual clauses should be providing an optimum foundation for the development of soft skills, thus contributing to a better cooperation rather than limiting it; a supporting hardware for the desired software.

As mentioned, discussing the different soft skills required for improvement of principal-agent relationship is out of the scope of this paper. However in order to provide some more insights about the dilemma of soft skills development in the projects, one of the most important prerequisite for the development of soft skills, trust, is briefly explained in appendix 2.

Appendix 2 - Dilemma of trust

In 2002, the results of a parliamentary inquiry directed towards fraud investigation within the Dutch construction sector revealed that the mutual price arrangements between the bidders has cost the public an estimate of hundreds of millions of euros in financial loss, however the exact amount could not be calculated. This fraud also inhibited the development of innovative solutions within the industry, since the arrangements would ensure the parties to get the work without competing on cost saving or original ideas. This incident caused large scale distrust in the Dutch construction industry (Tweede-Kamer-der-Staten-Generaal 2003).

Regardless of the aforementioned incident, as pointed out by different scholars, distrust has become a norm not only in the construction industry of the Netherlands (Brand and Nijland 1998), but globally (Soares (2012)). Soares (2012) further argues that trust is treated as a commodity by the means used to promote it. He asserts that "(*trust) … should be treated as a set of moral values that should be incorporated in the inner of a human being as main drivers to change distrust into trust among construction players.*"
For better understanding and clarity, the definition of trust according to oxford dictionary will be considered; *"firm belief in the reliability, truth, or ability of someone or something."* Trust in ability is easier to be gained by the hard evidences; such as the past work experiences of a party, however trust in reliability and truth is very difficult to gain in a non-transparent relationship. Bijlsma-Frankema and Costa (2005) define two critical elements for trust; positive expectations and the willingness to become vulnerable. Positive expectations can be seen as the starting point of the cooperation since the parties begin a partnership only with the hope of gaining something from it. However willingness to become vulnerable comes in a later stage and can grow over time. It is only when the parties have enough trust in each other to put their guards down that the partnership and teamwork can perform efficiently. However trusting (and consequently becoming vulnerable) should not be done blindly, but as Möllering (2006) explains thoroughly, "… trust is firmly a matter of self-interest and rational choice by actors given the foreseeable outcomes of alternative courses of action. " Thus for trust to be logical and rational, self-interest and rational choice of the parties should be well-thought-out.
Explaining the same concept, Covey (2006) uses the matrix below to show the difference of blind trust (gullibility – zone 1) and sensible trust (judgment – zone 2). The other 2 zones are concerned with distrust (zone 3 & 4).



As it is explained by Luitjens (2013), the trust in project alliancing is positioned in the smart trust quadrant (zone 2); the propensity to trust will be high due to having aligned interests and the absence of restrictive contract terms, and the analysis will be high by increased knowledge and insight about the other party.

As cited by (Scott 2001),The construction industry institute defines trust as below.

"Trust is the confidence and reliance one party has in the professional competence and integrity of other party (parties) to contribute to the successful execution of a project in a spirit of openness, fairness and cooperation."

Another good definition of trust comes from Sako (1992) who defined three types for it: Contractual trust, competence trust and goodwill trust. This perception of trust proposes a hierarchy from contractual trust to goodwill trust and involves a gradual expansion in the congruence of beliefs about what is acceptable behavior.

The sooner this trust forms between the parties involved in a project, the more significant its effect would be on the performance and productivity of team members (Lung and Lung 2007). Although it cannot be expected for trust to be formed between the parties at the very beginning of the project, what can be done is to provide the setting for it to be developed as soon as possible; such as transparency, having aligned interests, accountability and commitment to aligned goals/objectives. Yet, as O'Neill (2002) puts the dilemma of trust, trusting can never be done without taking any risks: *"Elaborate measures to ensure that people keep agreements and do not betray trust must, in the end, be backed by trust".* And further continues: "… trust is needed precisely because all guarantees are incomplete" in other words "where we have guarantees or proofs, placing trust is redundant". But as it will be explained in the next section, relationship contracts aim to implement trust in the project teams and between the different parties as soon as possible in order to promote better cooperation.

Appendix 3 – Elements/components of PA

Elements/Components	Cited by Authors																
	Green and Lenard 1999	Black, Akintoye et al. 2000	Scott 2001	Quick 2002	Ross 2003	Walker et al 2004	Haque, Green et al. 2004	Sakal 2005	Jefferies et al 2006	DTF 2006	Anvuur and Kumaraswamy 2007	AIA California Council 2007	John F.Y. Yeung 2007	Dikmen et al 2008	Lahdenperä 2009	Love, Mistry et al. 2010	Reza Ghassemi 2011	Mills, Walker et al. 2012
Aligned Commercial incentives with real gain-share/pain-share arrangement tied to the final outcome of the project not the individual contracts		■	■	■	■	■	■	■		■		■	■		■	■	■	■
Legally binding single Joint multi-actor contract			■	■	■	■	■	■		■		■	■		■	■	■	■
3-limb compensation model				■	■	■		■									■	
Collective management and liability of all/most of risks				■	■	■		■	■	■							■	
Open book accounting				■	■	■	■	■	■	■		■						■
Early involvement of key participants			■		■		■	■				■	■				■	
determining project design and cost after formation		■			■			■				■					■	
Selection based on Performance criteria/best value					■			■				■			■		■	
Equity and equality and uninimous decision making	■			■	■	■	■	■		■	■		■	■				■
aligned goals & objectives	■	■			■	■	■				■	■	■			■	■	■

Single Information management system (ICT integration)					■	■						■				■	■	
Integration and joint project organization (location wise)				■	■	■	■		■	■						■		■
Dispute resolution process	■	■									■		■	■	■			
Clear understanding of roles and responsibilities		■	■	■	■		■					■		■				
Long-term perspective	■	■												■				
Integrated team			■		■				■									
Single Project duration			■		■	■												
Best Value Outcome					■	■												
strictly no dispute resolution process					■													
Commitment to quality		■																
Mechanism for realising and monitoring each party's objectives	■																	
Total cost perspective		■																
win- win attitude		■	■	■	■	■		■		■			■				■	■
Open communication		■	■		■	■				■		■	■	■	■	■	■	
Trust between parties	■	■			■	■	■		■				■	■	■	■	■	
No Blame culture and agreeing to avoid litigation by resolving issues within the alliance				■	■			■		■							■	■

Shared knowledge and information	■	■			■	■	■					■					■	
Openness, transparency, honesty integrity	■				■	■	■		■			■					■	
Best for project attitude					■			■	■			■						■
continuous improvement mentality		■				■										■		
Cooperative spirit and attitude		■				■	■		■		■	■					■	
Mutual Understanding															■			
Encouragement of Creativity and innovation					■				■					■				
Best people for project					■	■	■		■									
Alliance Charter (informal arrangement)				■					■									
Obligation of Good faith				■	■	■			■									
Flexibility & adaptability		■						■										
Sound close relationship and interaction		■			■						■							
Leadership by the most capable organization												■						
Strong commitment and support by client & senior Management and the members	■	■	■		■		■		■					■		■		
Effective coordination						■								■		■		
Appropriate and required resources						■										■		

Appropriate technology																		
Use of BIM																		
Realistic understanding of expectations, interests and values of each party																		
Acting consistent with objectives																		
Dedicated team																		
project specific KPI's																		
continuous performance monitoring																		
Joint process evaluation																		
Use of impartial facilitator																		
Alliance workshops and team building events																		
Good cultural fit																		
Alliance Auditor (Financial) - for open book accounting																		

Explanation of elements

Below the different elements mentioned in the table above are explained briefly. It should be noted that the elements mentioned below are not always exactly as they were mentioned in the literature, but rather some changes are made in order to cluster the principally similar concepts in one criteria.

1. **Aligned Commercial incentives with real gain-share/pain-share arrangement tied to the final outcome of the project not the individual contracts**

The problem with misalignment of commercial interests between the owner and the contractor was explained before. An important feature of project alliancing is the alignment of commercial interest by instituting an incentive scheme that firmly links the returns of all the alliance participants to actual project performance based on specific criteria that were developed jointly by them. These criteria should be regarded by all the parties as being achievable yet not conservative (Scott 2001). The performance criteria are direct measure of project outcome rather than the performance of each individual separately, thus only win-win or lose-lose outcomes can be achieved. In other words, the profit of one party does not come at the price of a loss for another.

2. **Legally binding single joint multi-actor contract**

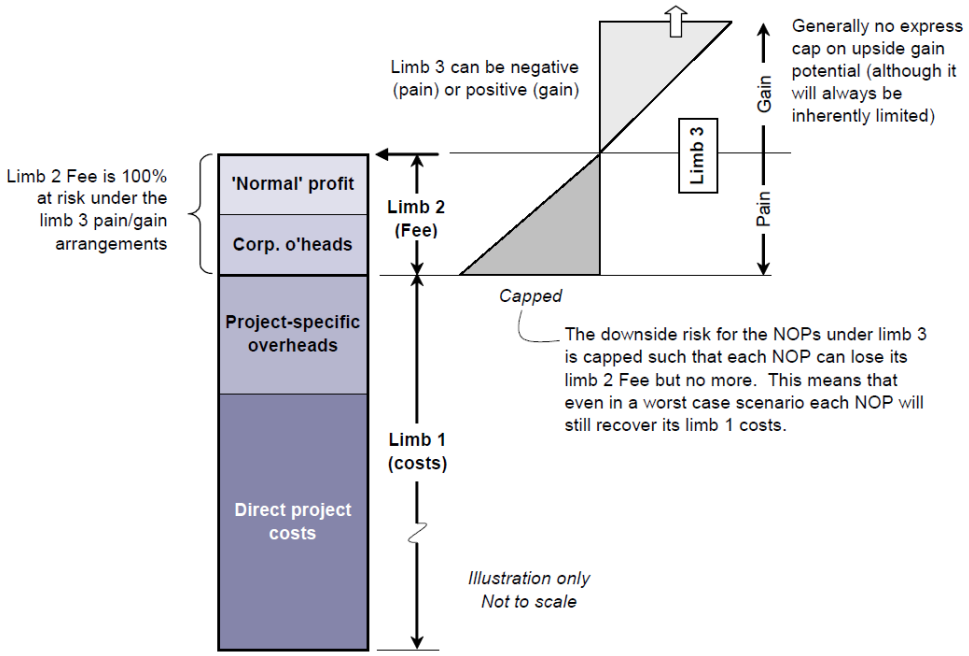
This criteria refers to having a formal, legally binding contract for the cooperation between the parties, in contrast of having informal arrangements for cooperation as a strategic move, which joins all the key actors involved in the project together.

3. **3-limb compensation model**

3-limb compensation model is developed as a gain/pain share mechanism that provides incentive for optimisation and yet keeps the risk of the contractor limited. It is a mechanism fully compatible with the already mentioned element, "aligned Commercial incentives with real gain-share/pain-share arrangement tied to the final outcome of the project not the individual contracts". As the name suggests, there are 3 limbs in this compensation arrangement:

1. first limb includes the actual project costs (direct costs occurred due to the project) and any project-specific overheads related to the work. These costs are subject to audit.
2. the second limb includes corporate overhead, which are the non-project specific costs that occur to the contractor's company and also the business profit, which is the "normal" and reasonable profit that the contractor is anticipating to make.
3. The third limb is the equitable pre-agreed share of pain or gain, depending on the actual outcome of the project, compared with pre-agreed targets.

In this model, direct costs (limb 1) is guaranteed to be paid to the contractor but limb 2 and 3 are at risk, depending on the project performance; rewards of outstanding performance and the gain of poor performance are shared equitably among all alliance partners to the extent of the sum of limb 2 and limb 3. Thus the risk for the contractor is limited to their reward plus profit and overhead. This provides enough security for the private parties to avoid becoming bankrupt (or getting into critical financial situation) by anticipating in large projects. In this model, the amount at risk for the private parties are usually capped as explained before, but the rewards are uncapped.



(DTF 2006)

This model ensures a real pain/gain share mechanism is implemented for the partnership where all the partners either win or lose together. And is considered by many literature the optimum compensation model for PA.

4. Collective management and liability of all/most of risks

Collective management of at least some of the risks is already mentioned as a prerequisite of creating PA. However this element refers to the increased shared domain by transferring all or as many risks as possible to the alliance organization.

5. Open book accounting

Usually open book accounting only applies to the change orders in a project but this criteria refers to having a completely open-book accounting for the entire project.

6. Early involvement of key participants

The most crucial stages of a project, is planning and design, as any mistakes during these stages can cause constant problems in the later stages of the project. These stages are where the most expertise and knowledge is needed to ensure a robust project execution. Furthermore open sharing of knowledge and information at the earliest possible opportunity provides significant potential for cost and time reduction in the project. It should be emphasized that this early involvement does not hinder competitive tendering. This selection can be based on both hard criteria, such as cost, technical competency and track record, as well as soft criteria such as corporate attitude and culture, management and etc. (Scott 2001). The general rule for this element is to involve the key participants as early as possible in the process.

7. Determining project design and cost after formation

An ideal situation for project alliancing is to include all the key participants in the process as early as possible (refer to the element “early involvement of key participants”). But it should be investigated how early is it actually possible? This criterion refers to first selecting the partners, forming the alliance then determining the design and finally estimating the cost together. Thus the input of all the partners can influence the design as early as possible and also the cost estimation would be much

more accurate and reliable. In this procedure, it is usually the case that after the cost determination, the client can decide whether they want to continue with the project or not.

8. **Selection based on Performance criteria/best value**

This criterion refers to selecting the partners on performance criteria rather than price. Performance criteria will assess the capability, competency and reliability of the bidders. Furthermore, the focus from choosing the lowest price is diverted to choosing the best value for money.

9. **Equity, Equality and unanimous decision making**

This criterion refers to parties having equal say, not only in the decision making processes, but in every aspect of project delivery. The unanimous decision making is for most cases limited to the alliance leadership board. But equality in the partnership means diminishing the power distance between the parties and creating the "real partnership" mentality and possibility.

10. **Aligned goals and objectives**

This criterion refers to aligning the objectives of all the participants in order to eliminate any conflicting interests within the alliance. If parties can agree on aligned goals, the efforts of one party for the sake of its own interests will be beneficial for the interests of the other parties.

11. **Single information management system (ICT integration)**

This element refers to integrating the ICT systems of different parties for the alliance organization in order to facilitate the use and management of information and resources, enabling a process automation between the parties.

12. **Dispute resolution process**

This element refers to having a pre-defined dispute resolution process that will be used in case a dispute arises between the alliance or main organization of the parties involved with regard to the project. The most ideal dispute resolution process is such that the problems are dealt with at the point at which they arise, and only if necessary should be escalated to higher levels of management.

13. **Integration and joint project organization (location wise)**

This element refers to having a single work location for the alliance organization. Most preferably this joint work location should be on the project site, however it can also be in the facilities of either parties.

14. **Clear understanding of roles and responsibilities**

This criteria refers to clear division of roles and responsibilities within an alliance and ensuring that each parties knows what they are expected to do. Therefore despite joint responsibility and liability against the external parties, internally the responsibilities and roles should be clearly defined. Such clarification of responsibilities is not to be used for blaming and finger-pointing, but rather it is to avoid double work, and to ensure each party is adding a value to the project and knows why they are included in the alliance. Therefore externally, there should be a joint responsibility and accountability, but internally, as any other team working, there can be a division of tasks and responsibilities.

15. **Long-term perspective**

This element refers to having a long-term perspective with regard to the different aspects of the project, such as long-term operation and maintenance considerations from the beginning of the project.

16. **Integrated teams**

For creation of effective project teams in an alliance, it is important that the parties recognise and demonstrate the fact that each one of them are accountable for fulfilling the task of the project that they were selected for but at the same time there is the collective responsibility for delivering the project. This means in order to have the most effective project team, each key function areas should be led by a person from the party initially selected for it and any duplicated function should be eliminated (Scott 2001). This will not only have immediate benefits through a reduction of manpower resources in the project, but will also ensure a clear division of responsibilities between the project team.

17. **Single project duration**

This element refers to limiting the duration of alliance organization and partnership between the parties to only a single project.

18. **Best value outcome**

This element refers to the concept of aiming for the best value outcome of the project rather than the least expensive, quickest or etc.

19. **Strictly no dispute resolution process**

Opposed to defining a dispute resolution process, this element refers to deliberately not having a dispute resolution process, as it is considered redundant, provided other elements and requirements for PA are presented, such as real pain/gain share mechanism, best for project attitude, aligned goals and etc. Furthermore it is discussed whether having a dispute resolution process would encourage people to more disputes.

20. **Commitment to quality**

This element refers to having the quality of the work as a priority for all the parties involved and basing decisions on this fact.

21. **Mechanism for realizing and monitoring each party's objectives**

This element refers to safeguarding and evaluation of each party's objectives. Thus there should be a mechanism that monitors the objectives of each party throughout the whole project duration and ensures that those objectives are met.

22. **Total cost perspective**

This element refers to integrating the financial balance sheet of each party into a single balance sheet, focusing on the total cost and profit maximization of all the parties together, instead of separated balance sheets that focus on the profit maximization of each party independently.

23. **win-win attitude**

This element refers to having a win-win attitude an mentality in the partnership of the partners in the alliance. This does not necessary mean having a real pain/gain share mechanism that enforces such mentality.

24. **Open communication:**

Having open communication in project alliances means sharing all the necessary and related information for the project that might even have been considered confidential in the conventional way of business. In order to have open communication, it is important that the communication lines be shortened as much as possible. Furthermore structures and process should be established with

enough flexibility to support easy flow of information. Another aspect of open communication is having a two-way, instead of one-way communication process that ensures the input of all parties are taken into consideration for the benefit of the project.

25. Trust between the parties

PA is requires a trust-(vs. control-) based culture. Therefore trust is considered an important factor for it in many of the literatures. However two different view can be observed on trust in the literature, which both are clustered together in this element since they refer to a similar concept; trust as a prerequisite or trust as a result of forming an alliance.

The first view states that a minimum level of trust between the parties is necessary before considering PA. This minimum level of trust can be due to past experiences or familiarity with each other and further in the project, this trust will be fully developed. On the other hand, the second view states that trust cannot be considered as a prerequisite for adopting alliancing, but deciding on alliancing actually requires taking an initial "leap of faith". However this leap of faith is not taken completely blindly, but as can be derived from the definitions of trust mentioned in the previous section, it is based on considering the self-interest and rational choice of the parties, and also protected partly by the contract and the evidences regarding the past reputation and experiences competencies and commitment to work. Thus the required trust for adopting project alliancing, comes after confirmed reliability of the parties. However both of these view are compatible with each other with closer study; what in the second view is referred to as "leap of faith", is considered the initial trust by the first view.

26. No blame culture and agreeing to avoid litigation by resolving issues within the alliance

This criterion refers to developing a no blame culture within the alliance. This means instead of traditional way of first finding the liable party for a problem and then attending to the solution, the priority goes to the solution. For this culture to form between the parties, it is advised in a number of literatures to agree in advance on avoiding litigation.

27. Shared knowledge and information

It is clear that one of the main purposes of PA is to benefit from sharing of knowledge but this element puts more emphasize on this fact and considers it as an important requirement.

28. Openness, transparency, honesty integrity

This element refers to the creation of a transparent partnership between the parties and emphasizes the importance of openness in achieving the goals of PA. Furthermore it is expected for parties to act according to integrity principles.

29. Best for project attitude

This element refers to having the best for project attitude by the representatives of all the parties in the alliance. Therefore after the formation of the alliance, it is necessary for the personnel of alliance organization to focus on what is best for the project and not what is best for their own organization.

30. Continuous improvement mentality

This element refers to the alliance organization's continuous strive for improvement.

31. Cooperative spirit and attitude

This element refers to the existence of cooperative spirit and attitude between the parties in the alliance organization.

32. Mutual Understanding

This element put emphasize on parties trying to recognize the interests and decisions of other parties within the alliance team.

33. Encouragement of Creativity and innovation

This element refers to the creation of an environment which is encouraging creativity and innovation as one of the main goals of forming a project alliance.

34. Best people for project

The criterion refers to putting the most suitable people for the roles in the project, from each party's organization.

35. Alliance Charter (informal arrangement)

Alliance charter is an informal agreement that partners in the alliance develop to describe the program and cost targets, performance requirements and risk and reward arrangement. Furthermore the general goals and principles can also be included, for example achieving a high quality project via a transparent, honest and authentic partnership.

36. Obligation of Good faith

This element refers to having an express commitment by all parties to conduct their activities related to the project in "good faith".

37. Flexibility & adaptability

Project alliancing is a close partnership model, therefore for it to work it is important that parties have flexibility in their conducts and decisions in order to ensure the collective interest of the parties are achieved.

38. Sound close relationship and interaction

In project alliancing, relationship is the most important issue. According to this criterion, development of a close relationship between the parties is crucial to the success of the alliance. This relationship is not recommended only on a corporate level but is also considered important on a personal level.

39. Leadership by the most capable organization

According to this criterion, it is important in project alliancing that the most capable organization takes the role of the leader, especially in the alliance management team. Having a leader is not against the equality principle but as any organization, an alliance organization also needs leadership. However this leadership is not necessary the role of the client (owner) of the project, but rather should be done by the most capable party.

40. Strong commitment by client & senior Management and the members

For PA to be introduced to an organization, senior personnel frequently play a vital role by selling the concept, convincing doubters and finding appropriate individuals who can nurture the alliancing process on a day-to-day basis. This commitment and support should be from senior managements of both the owner's organization and the owner's key representative on the project team. (Scott 2001)

41. Effective coordination

Effective coordination in project alliancing, as any other partnership is crucial for the success. This refers to having mechanisms that ensure an effective coordination not only between the project management tasks, but also between the parties and their organizations.

42. Appropriate and required resources

Having appropriate and required resources is naturally an important success factor for every project.

43. Appropriate technology

Appropriate technology refers to the availability of the required technology for furthering the project and achieving the goals.

44. Use of BIM

Building Information Modeling (BIM), is a process involving the generation and management of digital representations of physical and functional characteristics of projects. This element refers to using BIM as a centralized database for planning and management of the projects.

45. Realistic understanding of expectations, interests and values of each party

Having aligned interests is considered the most important perquisite for project alliancing. Therefore it is important to understand each party's interests, values and expectations from the partnership prior to entering a binding partnership.

46. Acting consistent with objectives

For party's to trust each other and to achieve their objectives, it is important that each party acts consistent with the predefined objectives. This will not only ensure that the partners are working towards the common goals, but also would reassure each party of the contribution of others to the success of the PA.

47. Dedicated team

This element refers to having a devoted and enthusiastic team in the alliance organization.

48. project specific KPI's

This element refers to defining project specific key performance indicators, prior to the start of the project.

49. continuous performance monitoring

This element refers to having a mechanism for continuously monitoring the performance of the alliance organization.

50. Joint process evaluation

Having joint process evaluation refers to the assessment of the performance of all parties together as a whole in order to make continuous improvement possible.

51. Use of impartial facilitator

This criterion refers to having an impartial (third party) facilitator in order to ensure that the partnership is being developed on the right track.

52. Alliance workshops and team building events

As already mentioned, having a good relationship is one of the most important issues in PA. For this purpose, team working activities and workshops can be used in order to stimulate the development of the desired relationship.

53. Good cultural fit

This element refers to the compatibility of the organizational culture of the parties in the alliance.

54. Alliance Auditor (Financial) - for open book accounting

This element refers to having a financial auditor in the alliance to ensure the trustworthiness of the expenditures.

Appendix 4 – Minimum and Pure PA

From the literature review (appendix 3), the following spectrum can be drawn for "pure" project alliancing and "minimum" project alliancing.

Minimum requirements for a partnership to be considered a PA	"Pure" form of PA (Minimum requirements + …)
1- Formal contract 2- Early involvement of key participants 3- gain/pain share arrangement tied to the end result in which the outcome is either win-win or lose-lose 4- unanimous decision making 5- aligned goals and objectives 6- no blame culture 7- selection based on performance criteria 8- best for project attitude 9- collective management and liability of some risks 10- Integrated project team	11. 3-limb compensation model 12. Collective management and liability of all risks 13. Open book accounting 14. Determining project design and cost after formation of the alliance 15. Single joint multi-actor contract

Minimum PA: For a partnership model to be considered a PA, it is necessary to be a **formal contract** between the **key parties involved in the project from the earliest possible moment**, who have **aligned goals and objective** and were **selected on the basis of performance criteria**, willing to work together in a **no-blame culture** and with a **best for project attitude**, forming an **integrated project team** whose financial interests are aligned through a **real gain/pain share arrangement tied to the end result** of the project, and by means of **unanimous decision making**, **collectively manage some of risks**.

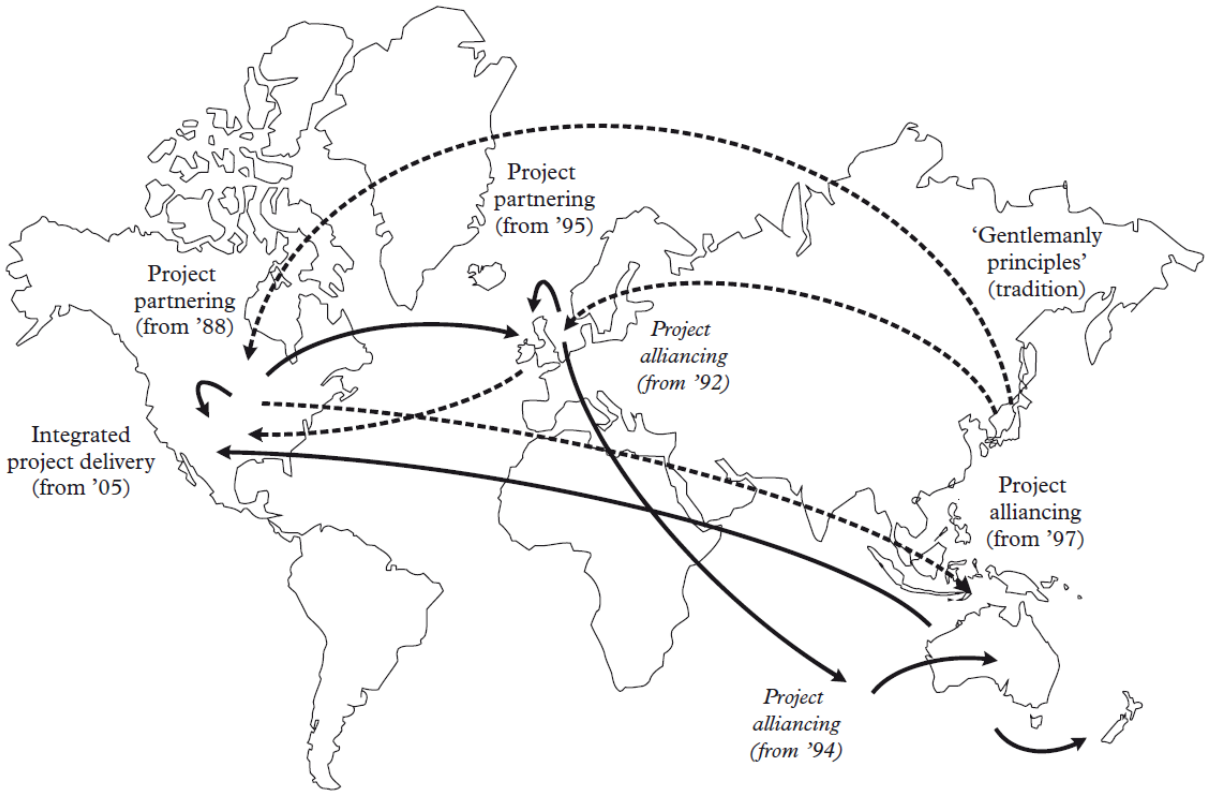
Pure PA: For a partnership model to be considered a pure PA, in addition to have the requirements mentioned for minimum PA, it is necessary that the **project design and cost to be determined after the formation of the alliance**, with **nearly all risks (and opportunities) being shared amongst participants**, who work together on a basis of **open-book accounting** with a remuneration mechanism similar to **3-limb compensation model**, via a **single joint multi-actor contract**. Thus ideally a pure PA is formed close to or at the end of feasibility study.

Appendix 5 – PA in Depth

Comparison of different relationship contracts

Although there are several forms of relationship contracting developing in different countries (as mentioned: integrated project delivery, project partnering and project alliancing), they all have the same root, but were developed differently.

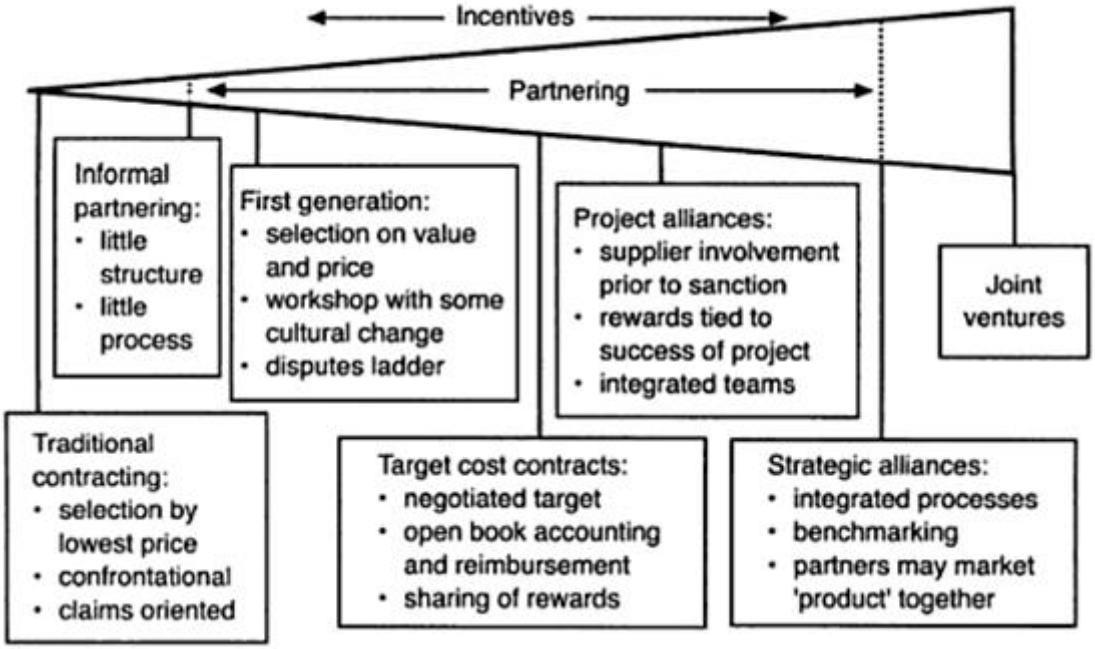
In an effort to explain the different relationship contracts, (making sense of) explains that PP paved the way for PA but has also adopted features from it, while PA has evolved further from traditional PP, and both PP and PA have clearly influenced IPD. He further provides a geographical map of different relationship contracts, showing their emergence, dissemination and interaction.



Emergence, dissemination and interaction of different relationship contracts – note: non-construction applications in italics (making sense of)

As Lahdenperä (2012) argues, project alliancing (PA) not only stands out between these since it has progressed into a real joint-liability arrangement between the parties, it should also be recognized as a project delivery system in its own right (i.e. a method comparable to design-bid-build, design-build and etc.). By providing a contractual model based on integration and collaboration, yet with a defined structure, PA is a more graspable concept. In other words, PA provides a configuration between the parties to develop their soft skills in the project and binds this development to hard results in order for all the parties to benefit from it. The other two forms of relationship contracting on the other hand are still developing as supplementary collaborative approach and arguably cannot be considered a separate delivery system (Quick 2002; Lahdenperä 2009). Thomson (1997) states that *'of all the new approaches to delivery of construction projects, project alliancing is the most innovative and it challenges many attitudes and practices which have long been entrenched in the industry.'* Broome (2002) illustrates the position of project alliancing among other partnership models as shown in figure below. As it can be seen, project alliancing is at the far end of incentive and partnership criteria that is legal for a public entity to practice via a PPP for delivering a product or

work in construction industry according to the EU legislations and without the need for special permit. The other two partnerships models which exceed PA in those aspects, strategic alliances and joint venture, refer to a longer partnership period than one project and are against the fundamental rule of equal treatment and open competition for delivering works according to EU public procurement directives and can only be used in a public-private relationship in exceptional cases.



Partnering Spectrum. (Broome 2002): PA is currently towards the far end of the partnering spectrum

PA in depth

In general, project alliancing refers to the relationship between the principal and the agent, regardless of whether they are public or private parties. However for the remaining of the thesis, the focus is only on the project alliancing between the public and private parties, respectively as principal and agent; since the construction of infrastructure projects, is mainly done by the request of public authorities and via contracting the private parties. Another reason choosing this scope constraint in the definition of project alliancing is that public parties face more struggles for adopting project alliancing due to the governing governmental policies, guidelines and regulations.

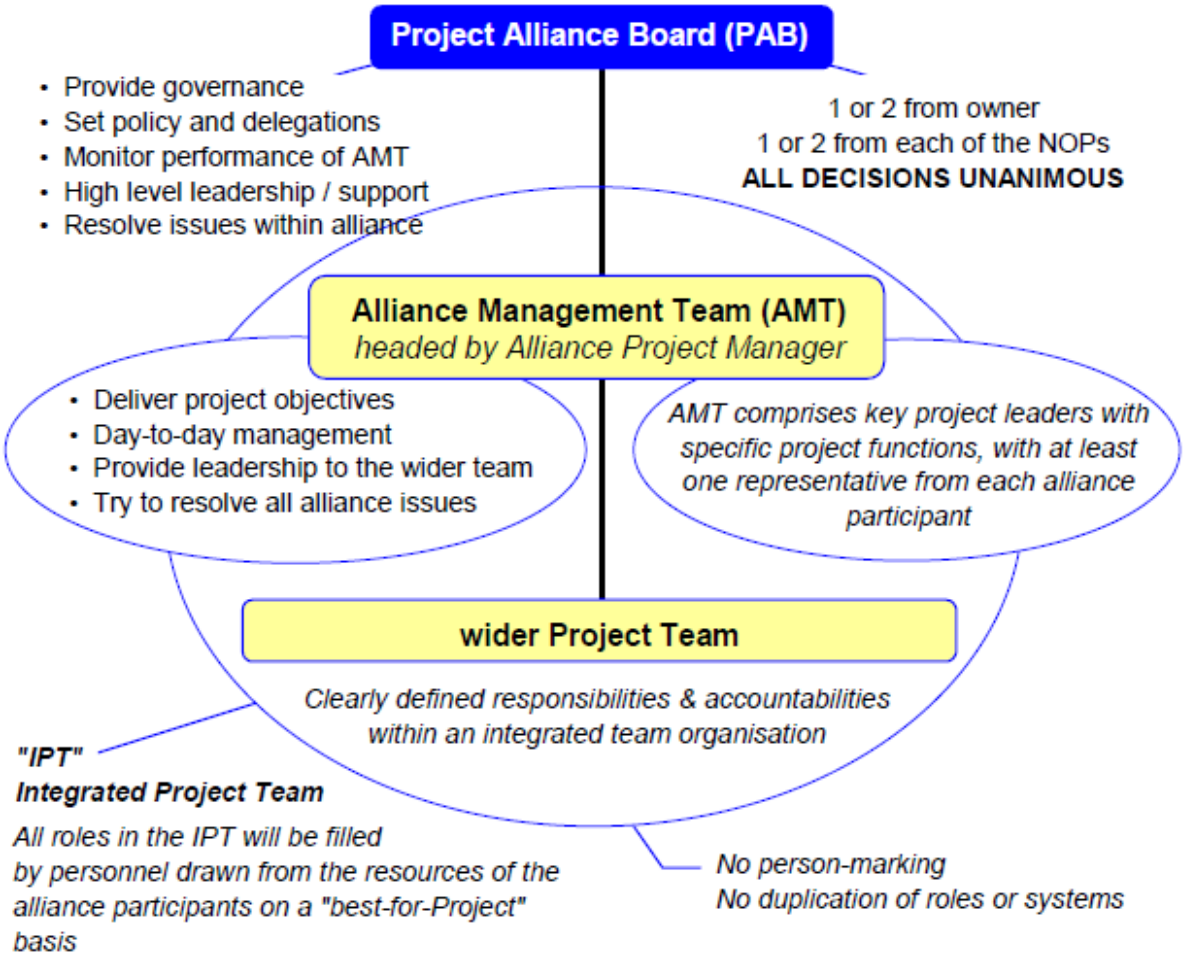
Although not clearly distinguished in the literature, there are two forms of agreement developed and used for project alliancing; an overarching alliancing agreement with underlying works contracts and a standalone alliance agreement. The former divides the responsibilities and risk domain of the project into three: owners, contractors' and shared. But the latter forms a single shared domain by linking the owner and contractor in a single contract and is usually referred to as the pure form of project alliancing. Depending on the project and regulations overseeing the work, one of these forms will be chosen. As a general rule, if the interdependencies (shared domain) are relatively large, standalone alliance agreement is the better choice. As (Jim Ross 2009) puts it, 'the concept of collective responsibility is fundamental to creating the commercial/legal foundation which has underpinned the success of alliancing in Australia. While a contract may have an alliance-like compensation regime (i.e. Open book, target cost with performance incentives) and may be referred to as an alliance, if the obligations of the contractor (s) remain distinct from those of the owner it is unlikely to create the kind of one-team "virtual organization" that has been a key characteristic of most Australian alliances.'

Difference with strategic alliancing

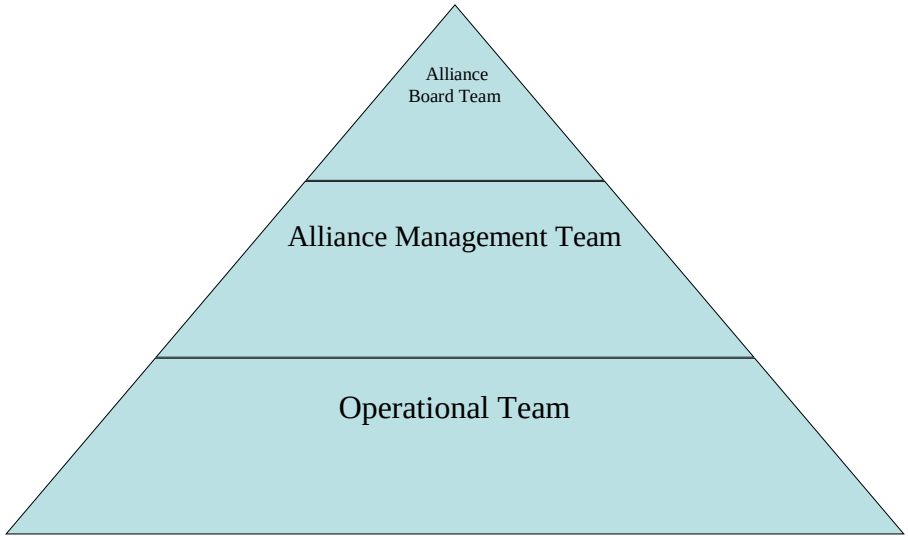
Alliancing is a business strategy linking parties together. Scholars categorize Alliances in two main types: Strategic alliance and Project alliance. The former covers the provision of services over a specified period of years, for a specific purpose and extends beyond a single project (Love and Gunasekaran 1999; Scott 2001) but project alliance refers to a project delivery strategy that is intended to bring participants together at the earliest phase possible and join them by risk sharing and incentives tied to the output of the project (Manivong and Chaaya 2000; Hutchinson and Gallagher 2003). This is believed to improve project performance and eliminate problems occurring due to integrated project delivery models by involving key parties from the beginning.

Project Alliance Structure

Ross (2003) uses the diagram below in order to illustrate the typical structure of project alliances. As it can be seen, the wider project team is managed by the alliance management team, and together they form the integrated project team. On a higher level, there is the project alliance board that provide governance and support, set policy and acts as an escalation level for the alliance.



Koolwijk and Geraedts (2006) use a pyramid model to describe the structure of PA. This pyramid model is divided in three levels: strategic management, tactical management and operational management; respectively referring to alliance board team, alliance management team, and operational team.



Alliance board team is concerned with the administration and governance of the project organization, alliance management team is concerned with the daily management of the project and the operational team is concerned with the design and execution of the project.

Advantages of PA

In brief, the following advantages have been recognized for PA:

- Embeds collaboration (Walker, Harley et al. 2013) by focusing on similarities rather than differences. (Walker and Hampson 2003)
- Identifying, selecting and involving all the key actors in an early stage of the project development (Scott 2001; Lahdenperä 2009)
- Decreasing bureaucracy and monitoring costs. Rationalized and streamlined project procedures that led to reduced resource requirement, thus more efficiency. (Scott 2001)
- Enhancing practices, processes and procedures that are transferable to future projects, even those that are not alliances. Improving employee's communication and problem solving skills. (Scott 2001)
- More realistic cost estimations by using the knowledge of all the key parties involved and transparency in the pricing of the project, including all the contingencies and allowances for risk (DTF 2006)
- Optimum risk sharing and management, instead of siding teams (Sakal 2005)
- Faster and more flexible problem solutions at the lowest level possible, 'no blame' culture (Walker, Harley et al. 2013) by agreeing to resolve all conflicts internally, without recourse to litigation or arbitration.(Rooney 2009)
- Improve productivity by providing a cooperative atmosphere, increasing trust and transparency. Decreasing opportunistic behavior and hidden agendas (Rooney 2009).
- Promote innovation (Walker, Harley et al. 2013) through open communication (Ross 2003) and sharing of knowledge and decreasing power distance for better team performance. (Mills, Walker et al. 2012)
- Flexible "change" management (Sakal 2005)
- Incentives, cost-based payment (no risk reserves) and transparent pricing & cost monitoring are likely to allow realizing the project at a competitive price and provide a better real time understanding of the project situation. (Lahdenperä 2009)

- Client's more involvement and informed decisions on technical solutions (Walker, Harley et al. 2013)
- Creating commercial alignment by giving the contractors a direct financial stake in the efficient design and execution of the whole project (rather than any individual participant's performance) via a performance incentive scheme (Scott 2001; Broome 2002; Quick 2002; Walker, Harley et al. 2013)
- Embodiment of the concept of a "Fair Exchange", "all win or lose together" mentality.(Rooney 2009)
- Employees are much happier in their work (Scott 2001). Creating more desired working environment and a culture of trust between the owner and the contractor
- Exposing hidden risks (Rowlinson, Cheung et al. 2006)
- The success and principles of the alliance may be used as a catalyst for developing the rest of the organization (Ross 2003; Lahdenperä 2009)
- Eliminating contractual barriers for optimum partnership

The main benefits of PA are the alignment of interests and encouraging working towards a shared goal, thus eliminating the adversarial behavior and creating a win-win situation (Black, Akintoye et al. 2000; DTF 2006; Jefferies, Brewer et al. 2006; Lahdenperä 2012; Mills, Walker et al. 2012; Walker, Harley et al. 2013). However it should be noted that project alliancing is simply a relationship contract model in progress that will be advantageous only if implemented for the right project, with the right partners and properly improved over the course of time and according to the circumstances.

Shortcomings of PA

Overselling the concept of project alliancing can cause disappointment, despite a successful project. The advantages and shortcomings should both be mentioned and considered before deciding for a project alliance, otherwise falling short of the promises and expectations would discourage further use of this model. Below some of the shortcomings mentioned for PA in the literature is brought:

- Shared risks and cooperation model limit the possibility to seek compensation for other's mistakes (Lahdenperä 2009)
- Liability insurance may not cover damage caused by one alliance partner to another in the alliance relationship (Lahdenperä 2009)
- The model requires high commitment and support by partners' upper management (Lahdenperä 2009)
- Changing from the old way of doing business to a new model requires a cultural change and could experience resistance.
- Creation and maintaining an alliance requires relatively lots of effort and resources (Lahdenperä 2009)
- The model leans heavily on personal relations such as trust and it is possible to fail in building them (Lahdenperä 2009)
- The joint organization and unanimous decision making force the owner to give up part of its authority in the project (Lahdenperä 2009)
- Despite sometimes having set a maximum price, the actual price of the project is not certain until the completion (Lahdenperä 2009)
- The low-key price competition makes it difficult to prove financial soundness to those monitoring the public owner (Lahdenperä 2009)
- Staff members of the consortium that won the quality-based selection may be replaced by others as the process continues.

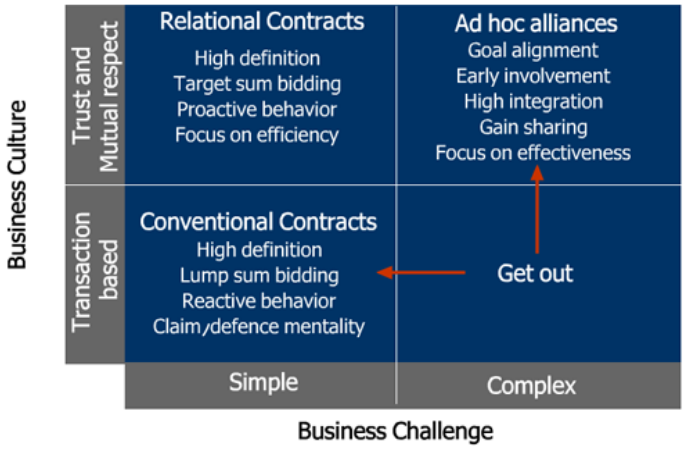
- The partners bear risk for the entire project and actions of others that they can influence only marginally. (Lahdenperä 2009)

Project Alliancing preconditions and success factors

Due to progressive nature of PA as a delivery system, not only there is no single set of features agreed upon for PA in the literatures, the principles and success factors have been used interchangeably between some of the sources. In other words, what has been defined as a principle to PA in one article, is named a success factor in another. Therefore the table in appendix 3 has been prepared in order to identify the most highlighted principles and elements for PA in the literature. What should be noted is that in principle PA is meant to promote collaboration between the parties by providing a legal, fully aligned goals/interests (commercial and non-commercial) and risk management structure that facilitates this promotion through a "best for project" attitude. Which in absolute sense means sharing all the uninsurable risks, having the interests of all parties tied directly to the successful delivery of project according to the pre-defined criteria, diminishing power distance between the key parties by unanimous decision making, full integration of parties, a legitimate cooperation contract with a no-blame culture and a pain/gain structure that effectively aligns the commercial interests of parties by means of a mutual alliance fund. As a result forming an "all swim or sink together" arrangement. Yet a project might be considered alliancing by deviating from these principles to some degrees. But of course the expected results should be adjusted accordingly. As Ross (2003) mentions, *'there is a concern about owners adopting collaborative models, often labelling them as alliances, with expectations that they can deliver alliance-like outcomes when in fact the models are not structured to create a true alliance environment or driver alliance behaviors.'*

When to use PA?

Forming of an alliance structure and team for PA has its challenges and requires relatively large amount of attention, effort and resources. Thus PA is not suggested for projects that do not offer much room for improvement, such as small scale, routine projects. Scott (2001) uses the matrix below to generically demonstrate the suitable businesses for alliancing:



Business challenge/culture matrix. Source: (Scott 2001)

More specifically, the projects with the following characteristics are suggested for PA in the literature:

- For projects where principal has been unable to identify, and the contractor has been unable to price, the risks involved. (Quick 2002)
- Unusual objectives or objectives which cannot be priced (e.g. unusual environmental requirements, community issues, etc.) (Quick 2002)
- Complex interfaces (Ross 2003)

- Difficult stakeholder issues (Ross 2009)
- Complex, large (scope) and risky projects (Scott 2001; LAHDENPERÄ 2011)
- Difficult stakeholder issues (Ross 2003)
- Complex external threats (Ross 2003)
- Very tight timeframes (Ross 2003)
- A high likelihood of scope changes (e.g. due to technological change, political influence, etc.) (Ross 2003)
- A need for owner interference or significant value adding by the owner during the delivery (Ross 2003)
- Threats and/or opportunities that can only be managed collectively (Ross 2003)
- High uncertainty towards risk and scope of the project (Ross 2003)

Appendix 6 – The interview protocol (standardized)

	Question/discussion point	Purpose of asking
Opening Questions	How familiar are you with PA and what do you think of it?	To find the interviewees perspective, whether they have an objective viewpoint towards PA, whether they have had good/bad experiences of PA, whether they have enough information about PA. **[lack of knowledge and skills]**
	What is the definition of PA in your organization? what does PA mean to you?	To investigate if different interviewees have the same, or similar definition for PA. and if they mean the same principles and concepts by PA **[lack of knowledge and skills] [High complexity]**
	Conditional question: If they mention advantages of PA in their definition, then…. How important are these advantages for your organization? (value of advantages)	To Investigate the interviewee's viewpoint on the advantages offered by PA and how important he/she considers these advantages for the organization and whether there is a substantial difference between interviewees perspective of value of advantages. **[complex observability of the benefits] [insignificant relative advantages]**
	Why despite the experiments are claimed to be successful from the evaluation reports, your organization has not yet applied PA for other projects?	The main research question, to investigate the interviewees perceptions of existing barriers before digging further to potential barriers of the literature study. Thus examining what they think can be the most important barriers without possible unintentional influence of the interview. **|open question|**
Literature based discussion points and questions	Do you know how and why your organization decided for an alliancing project in the first place? Do you know of any researches for it before or after the project?	Were there enough researches on the topic before committing to it. Exploratory, feasibility, policy researches and etc. **[lack of proper researching] [research deficiencies]**
	Can there be accountability difficulties by using PA?	How extended is the interviewees knowledge and perspective with regard to accountability concerns of PA, and whether this can be seen as a barrier. **[Lack of knowledge and skills] [accountability concerns]**
	What is your opinion about the motivation / priority of using PA in your organization?	Does the interviewee believe there is enough motivation for using PA in the organization? Are there other priorities that might keep using PA out of the spotlight for now? **[incompatibility] [ritualistic behaviour] [resistance to change] [short-term thinking]**
	Comparing your experiences in project alliancing, with other colleagues who have not been involved in such project, do you think there is any difference of attitude towards PA? What do you think about the knowledge of these colleagues over PA?	Investigate possible negative attitude towards PA as a barrier and also possible knowledge gap between two groups of people; involved-in-PA & not-involved-in-PA and also innovation department and the main organization (Chinese wall) **[an isolated innovation department] [lack of knowledge and skills] [resistance to change]**
	Do you think type of project (rail, road, tunnel, bridge,…) and partners have influence on choosing PA? How about the project size?	To investigate whether the interviewees consider their organization's projects not suitable for PA. **[incompatibility]**
	Do you believe market parties are in	Not trusting the market's expertise for PA and their culture

	general ready for such cooperation? Knowledge, expertise, culture, etc.	might be seen as a barrier **[Control vs. trust] [lack of knowledge and skills] [path-dependent development]**
	What is your take on trust-control level desired by your organization?	To investigate whether a potential barrier of not using PA can be due to wanting more control over projects. Trust-control balance for PA is more towards trust and in transactional contracts towards control. **[control vs. trust]**
	What do you know about your organization's strategy with regard to new contractual models? And PA?	Investigating whether there is a supporting strategy for using new contractual models, and consequences such as more openness with the private parties. **[Policy vacuum] [Path-dependent development] [Short-term thinking] [improper planning] [Not enough initiative] [compatibility] [lack of real commitment] [long era of past success]**
	Are you aware of any policies/frameworks/procedure/standards for using PA within your organization for the future? what is a typical procedure for an alliance project to be executed?	Investigating the existence and/or clearance of policies concerning future use of PA. Are such potential policies correctly communicated to people? (people involved in the PA experiments are logically expected to be the most informed of such policies. As the organization has invested in their knowledge) **[Policy vacuum] [Path-dependent development] [lack of actionable outcome/steps] [Not enough initiative]**
	What is your opinion about the organizational support during your experience in PA? Any examples? What kind of support did the higher management provide?	Was there enough support provided by the organization and the higher management? **[lack of top management support] [ritualistic behaviour] [lack of real commitment] [backlashes of the experiments]**
	What do you think about the current number of PA experts within your organization to fill the IPM roles and other required positions?	Availability of human resources and knowledge **[lack of knowledge and skills]**
	Security in the existing way of business or taking risk on new partnership forms, what is your opinion? What do you think is the dominant opinion in your organization?	Risk adverse vs risk taker culture. **[Long era of past success] [Unfitting organizational culture]**
	What is your general opinion about cooperation tools that are currently being promoted within your organization? How effective do you consider them?	**[lack of actionable outcome/steps] [ritualistic behaviour] [Unfitting organizational culture] [resistance to change] [Commitment**]
	Do you think the external regulations overseeing your organization are compatible with use of new partnership models? What about specifically PA?	To investigate whether the interviewee believes that external regulations are inhibiting their organization from practicing PA or not. If so, what aspects of PA are conflicting with the regulations and if not, then what other reason could there be? **[accountability concerns] [compatibility]**
	Do you think any changes are required within your organization in case they want to implement more alliance projects? **(if yes, then…)** how likely do you think it is for these changes to be	**[resistance to change] [Commitment] [resistance due to interests, values and norms]**

	happening in the near future? Do you see any obstacles along the way for these changes?	
Closing Questions	Do you consider your project a success? What would you say could have been done better?	**[backlashes of the experiments] [complex observability of the benefits]**
	What do you think was most challenging in your PA experience? What can you say you didn't like about working in PA?	Finding the challenging procedures or components of PA and investigating whether they could be a factor in PA not being implemented after the pilot project. **[backlashes of the experiments] [high complexity]**
	Do you know what steps are needed for implementing another PA? Do you know of any guideline within your organization for this purpose?	**[lack of actionable outcome/steps]** **[Research deficiencies]** **[improper planning]**
	What is your final advice with regard to future PA's of your organization? How do you suggest to further the development of PA in your organization?	**|open question|**

Appendix 7 – The Project Personnel's interviews Quotes

#	Quote	Group
Q1	I think one of the barriers is the fact that political parties prefer DBFM contracts over other forms and this can be due to the predictability of cash flow in DBFM contracts. In DBFM you flat out your payments but in PA and D&C you have a pick. This pick on itself might still be financially cheaper for the public organizations than DBFM agreements but due to large projects that we have and the 3% budget deficit agreement of Brussel, DBFM contracts becomes more interesting. Since this way a financial agenda can be created to keep this budget deficit at level.- interviewee #2	1
Q2	I think politicians have more confidence in DBFM projects due to its postponed financing of the projects. Because in DBFM you will not pay for the realization of the project but for the service provided. That's why despite being arguably more expensive, they are still attractive for politicians. This is the choice that policy makers have made in the past 6-7 years and I believe this is the main barrier for PA. – interviewee #3	1
Q3	I don't think external regulations and politics are actual barriers for PA, we had a lot of discussions with the political parties about the integration and safeguarding the interests and etc. and they all seemed very enthusiastic about it. People were a bit sceptical about putting public and private parties together in one building but if you open up and let people know how you are doing it, thus in a transparent manner, such sceptics will diminish. Therefore I don't think it is a barrier but still could be lack of knowledge. – interviewee #5	1
Q4	The barrier in this regard could be that there is no external pressure to use PA, for example for DBFM contracts this pressure was there since the beginning, thus significant attention and resources were given to it. Such as the knowledge pool since 2007 to 2011 for DBFM contracts, something that we don't see for PA. – interviewee #8	1
Q5	"I believe after A2Hooggelegen, adopting PA was no more a policy of Rijkswaterstaat. Seems to me that the organization's strategy has been changed in this regard. This can be due to the background that Rijkswaterstaat has with DBFM contracts, thus the organization invested more in those contracts." – interviewee #2	1
Q6	"Currently our policy is to transfer as many risks as possible to the market. I personally think that we should carry more risks, since we as an organization will learn more by carrying the risks. Now with DBFM contracts, we cannot see the real struggles the contractors are facing, thus we will not learn from it." – interviewee #1	1
Q7	"We have a uniform work, which consists namely of three kinds of contracts: performance, D&C and DBFM contracts." – Interviewee #1	1
Q8	"Currently we have no clear PA policy within RWS, me and my colleagues tried to put it out there but it didn't work and we had to give up." – interviewee #5	1

Q9	"Rijkswaterstaat wants to have uniformity in approaching the market, and introducing another contract type in the contracts buffet (Contractenbuffet), is seen against this policy. So I think it's a matter of uniformity vs diversity, and RWS has chosen uniformity." – Interviewee #7	1
Q10	"a potential barrier for PA in RWS could be the project size; in ProRail projects require smaller finance, but in RWS we have some very large projects that require a large amount of finance thus PA cannot be used since providing upfront finance for them is impossible for us. Therefore in my opinion maybe only projects between 100-150 million euros are suitable for PA." - interviewee #4	1
Q11	"What I think is the problem with the cooperation with the market, which was also the case in A2Hooggelegen, is the human capacity (human resources). In the tender procedure, we agreed that project bureau of A2Hooggelegen, would consist of 50% RWS employees and 50% of the contractor. But finally it was around 15% of RWS and 85% of the contractor's staff. If Rijkswaterstaat believes in the alliance we should only watch the contractor from a distance and let them do the execution, PA will not work out. Therefore there should be more staff capacity for this purpose in Rijkswaterstaat." – interviewee #1	1
Q12	"… it was also one of the big discussions we had, because Rijkswaterstaat thought in advance that we are going to act as supervisors of the work and doing very limited actual work. But we did more within the alliance than Rijkswaterstaat initially thought. For us we did manage to make it work since we had our own networks and consulted them as needed but I think for future alliances it has to be a better balance, it doesn't have to be exactly 50-50, but a minimum is necessary, for example 25% (vs. 75%) seems reasonable." – interviewee #5	1
Q13	"… another issue to keep in mind is the stakeholder complexity of the projects, since this is what RWS has the most power in and would bring the most added value. But for example if it is about technical complexity, even though RWS is good, market is better. Thus less need for RWS to be that closely involved in the technical aspects." – interviewee #1	1
Q14	"… but there were still many positions within the stakeholder & surrounding and design teams which could have been filled with our staff."– interviewee #2	1
Q15	"Due to strong reorganizations RWS couldn't deliver enough people for the project. We had the intention of providing 50% of the staff in the alliance but at the end we didn't manage due to these reorganizations. In the Netherlands we have a diminishing government, and we have to figure out how to manage all these projects with less people, therefore in the organization there was a tendency to put only around 5 people for each project. The government wants RWS to be smaller and due to this shrinkage, less human resources are available. But still the volume of work stayed the same. Immediately after the contract was awarded we found out that we get less people than presumed." – interview #7	1
Q16	"If not enough representatives from RWS, you won't get enough trust from your own organization. You need a number of people who can operate as ambassadors here, because we were in a separate office, location-wise not so faraway but the	1

	mental distance was huge. The distance between the alliance and mother organization shouldn't become too big. Thus there is need for a critical mass for the number of personnel and 5 is certainly not enough." – interviewee #7	
Q17	"…due to the pressure of the politics, it is difficult to put PA as a priority for the organization."- interviewee #3	1
Q18	"…it is not an appropriate time for adopting a new contract form. There are too many things happening right now within the organization." – interviewee #2	1
Q19	"If you look into the highest management, they are focused with politic pressure and corporate tasks thus PA is not high on their agenda. Unlike DBFM which we have assignment to put a number of contracts in the market every couple of years, for PA such external pressure is not there. So this makes it get less attention and priority."- interviewee #5	1
Q20	" a main question here is: what was the next step of the experiment? People didn't think about that. Thus you see, after that experiment, suddenly everything stopped."- interviewee #5	1
Q21	"The timing of A2Hooggelegen was quite good, it was right after Betuweroute project, thus a good time to start the experiment. However it should have also been thought of the next steps of the experiment. For example, in an ideal situation, during the execution of A2Hooggelegen, another project should have been appointed and started for PA, to ensure the growth of knowledge would continue. Unfortunately such actions never happened." – interviewee #1	1
Q22	"there have been several instances that a director pointed at a couple of projects to be implemented via PA but then the concerning project teams worked really hard to avoid that and finally stopped it. I think it should be done with more persistence. Directors should be more directive about it! This is also the case for the directors of the different concerning departments, for example it should be seen why the procurement department is not more focused on this?"- interviewee #5	1
Q23	"There are a number of directors who believe in the potentials of PA, but they should take more initiation in appointing the next project. Because currently this is the only way that a follow-up experiment can be assigned. There should be more push for it from the directors; otherwise it might not be taken seriously. Also with their initiation, project teams will know they will be supported throughout the process". - interviewee #5	1
Q24	"We had several presentations about different aspects of PA to promote it. And people seemed excited about it. But yet more attention is required for promotion of it, as it is the case for every new idea. One of the changes necessary for adopting PA, is to promote it more. And this promotion should be with increased knowledge of people about the advantages, the limitations, and the way of working. " – interviewee #1	1
Q25	"To promote the PA way of working, we got a few key directors close to us. This proved to be successful but yet not enough. We have to invest in our mother	1

	organization, something that we experienced to be more difficult than the project itself. And this is not limited to RWS, but also for the private parties as well." - interviewee #7	
Q26	"during and after the project, we tried to promote this way of working (PA), but if you are working full-time in the project to ensure the project goals are achieved, you will not have enough time for promotion. PA was interesting and fun for me, and probably the rest of the team, but it is also a lot of hard work. " – interviewee #5	1
Q27	"you don't hear much about PA, most of the people in the organization don't even know A2Hooggelegen was the first and last PA of RWS! " – interviewee #2	1
Q28	"We have had some discussions about the definition of PA. But it was not clearly defined. For me PA is having a shared goal and mutually trying to achieve those goals by sharing the employees (knowledge and capabilities of principal and contractor), the risks and the financial consequences. Or at the very least, sharing some of the financial risks; you have the contract and you have a mutual fund, but for me working together is very important. Also I believe the last projects that ProRail labelled as project alliancing, are more concerned with the financial aspects of PA and not relational aspects. " – interviewee #1	1
Q29	"For PA, no clear definition is known in RWS, 10 people would have 10 different definitions. We had an alliance-like contract, which was due to the financial part I mentioned before, there was no real financial shared domain. It was more like a DB contract but management team from the both parties. So it's not the same as ProRail, they've got financial alliances as well. It has to do with the procurement and the decision making, RWS does it differently. " – interviewee #2	1
Q30	"A question for people seems to be whether alliance contract is really a contract form or is it just a set of principles about how we are going to work together. " – interviewee #5	1
Q31	"Project Alliances until now was not seen as a separated contract, it was seen only as a risk-sharing mechanism that can be used in other contract types. Thus it was considered to be applicable to a part of the project that has complex risks. But since alliances are difficult and resource-consuming to set up, it cannot be used for small scopes. " – interviewee #8	1
Q32	"Firstly, project alliancing is about the interests of parties. In traditional contracts, the distinction between the client and the contractor is a vertical relationship but in the alliance you say we are equal and we all bring in the best we can for the project. this is a principle idea of the alliance. And one is not the boss of the other, so it's more a partner relationship. You can say the relationship between the traditional contract is like parent and child but for alliance is like marriage. Thus equality between the partners. And secondly it is to have a kind of structure that you share benefits and losses in an equal way. So if one is winning then both parties are winning or for losing vice versa. But in traditional contracts it can easily happen that the loss of one would still be win for the other. Thus win-win or lose-lose situation are important in PA. And this is	1

	the key motor for achieving alignment of interests. It shouldn't be seen as a football match between the parties, each trying to win, and by doing so the other party would lose. That's the simple difference. " – interviewee #7	
Q33	"After deciding on using PA to realize the project, the idea was to start an independent company between Rijkswaterstaat and the private party. That company would then be responsible for the whole delivery of the project. This turned out to be very difficult to organise, because of the Governments Accounts Act (comptabiliteitswet) If one wanted to realise this company it had to be decided by the First and Second Chamber, which is quite an extensive procedure.) " - interviewee #1	1
Q34	"there were several projects in the last few years, which I believed to be extremely suitable for PA, but still it didn't happen, why is that? I think a sort of fear of what you are stepping in contributes to not doing it. That fear of not knowing is certainly a part of it. " – interviewee #5	1
Q35	"The lack of knowledge is not limited to the project teams, but also in the procurement level, we have only one experience with PA. therefore there is certainly not enough knowledge for it. But in other projects we have used some principles/parts of project alliancing, therefore there can be more information with regard to those sub-parts of PA. Furthermore in the implementation of PA in A2Hooggelegen, we only had 15 people from RWS involved (inside and outside of alliance). Thus only these people have the direct experience. We did have a couple of presentations in RWS for other staff and I guess something around max of 150 people in RWS would have information about how it is being done or how it works. But I don't think it is possible to "learn how to swim in the dry". Therefore for more learning and knowledge, it is necessary to have more alliancing projects. We did gain experience from A2Hooggelegen but it was not further developed since there was no more project alliances in RWS. You need to have new experiences to learn new lessons. But the learning for PA is now stopped in RWS. When people don't know how something works, there will be resistance against it, this was also the case for DBFM contracts some years ago. " - interviewee #1	1
Q36	"Since PA would only be beneficial for only a percentage of the projects, I think it would help to have a specialty in the competencies of project teams for both types of projects, alliance projects or non-alliance projects. Thus if a project is PA, then those experts should be involved in it. " - interviewee #1	1
Q37	"Do we really have to have knowledge about the different aspects? we are inhibited by a sense of security, we want to know everything in advance, before putting a project in the market. But with an alliance you are not always sure. Not everyone has to know everything. I think a lot of people know the basics, almost everyone who is a little bit interested in alliances knows it's about risk sharing and working together. The main principles are known. Due to uncertainty, people want to know more, but there isn't more! Alliance is just like a marriage, when you want to get married, you know each other, and you know things about each other but how it is going to develop and what you do together, you can't line out in advance. You don't know. What you know is after you say 'I do', you are going to make the best of it. You both put your effort and you trust each other and you will try to make it work.	1

	You can arrange a lot of things together in the contract but the way you are going to do it, you have to find it together. And it's not only the result that counts, it is also about the process, how to reach to the results. And I think we don't invest enough in that process. " - interviewee #5	
Q38	"The other people in the organization, who were not directly involved in the project, used to see project alliancing as a traditional contract and through the glasses of the other contracts. For those people, the project was just the same as the others. " – interviewee #7	1
Q39	"The mind-set of the organization was also important to be approval of this new contract type. And this also requires time. In the high management level, this mind-set was relatively good, due to the good experiences with PA in other countries. And they also wanted to try a new method. But in the workplace this approach was not known enough. And therefore there were questions such as "how is it possible to work this closely with the contractor?" or "are we going to work in the same location or separately?" or "how is it going to work out with the automation system?" – interviewee #1	1
Q40	"In the conventional contracts (even more by DBFM than D&C), you have a distance from the contractor. You will procure the product from them but will not be cooperating in making that product. And thus you are transferring the risks to the contractor. When you are not carrying the risk, there is less incentive to have a close cooperation. " – interviewee #1	1
Q41	"Rijskwaterstaat uses DBFM and D&C contracts mostly, and is therefore used to have more control in the projects. And this might be a reason that they see PA as losing this strict control. " – interviewee #2	1
Q42	"For example, in the conventional contracts, when there is change in scope, first you got to work it out, engineer it, determine the costs of it, the consequences, then try to make a deal how to do it. Then you sign the change contract and then start applying it. but in alliance we say this wouldn't work. The consequences for time and money we don't know but if are going to wait till we know, then it would become a bigger problem than it is, so there is a "go go go" mentality, and we trust that we would make a good financial deal between the partners. And for mother organizations it was difficult to decide about the content but not about the money, the trust wasn't there. So people in the organization had their doubt if this would turn out fine thus difficult for parties to accept. In the first year we thought we might have a big problem due to this, because if the contractor trusted the client in this procedure for a fair compensation but eventually he wouldn't get fairly paid, then the contractor would make a huge loss. We were very enthusiastic team in the alliance, but how you know for sure that you would get your money? They had to trust each other. It was a little bit insecure. It all comes down to; do you trust each other?" - interviewee #7	1
Q43	"For PA mentality to be embraced in RWS, a lot of investment in people is required and this will need lots of time, resources and getting used to. This is due to the fact that people are used to high control level of working. But PA requires a change in that to trust. This means IPM roles and especially contract managers should come out of their comfort zone. " - interviewee #8	1

Q44	"You can't control everything. You can't hold it in hand and manage it from RWS's point of view, you have to let go of it. And letting go is terrifying for a lot of people. " – interviewee #5	1
Q45	"In my opinion what is the core of project alliance is your own attitude, it's the way you act in the project, each partner, which makes a project successful. It is the same for DBFM projects or D&C projects. It depends how you and me interact as contractual partners, if we do not understand one another. And have no attention for each other's goals and opinions, we won't understand each other and we won't be successful in any contract. This is my experience. I am working in a DBFM project; attitude and behaviour are the same as in an alliance. It's far more cooperative than my colleagues cooperate and not cooperate with their partners. That's the information I received. " – interviewee #3	1
Q46	"One of the reasons that I think most of my colleagues don't have this attitude is that their conviction of how they manage a contract with a partner, whether big or small, there are people who are convinced that you do not negotiate or try to come together on issues. You just follow the contract. In my opinion the contract is a means and not a goal. But the goal is successful realization of the project. Success is not only be on budget and on time but also for people to go to work and enjoy the work together. Whether they are from private or public partner. That means that I differently enter into discussions about extra work, less work, and etc. If they do not adopt that conviction, it will not work. " - interviewee #3	1
Q47	"This attitude can be acquired via learning on the job. It is true that in DBFM or D&C contracts, it is more difficult to develop such attitude but also if you don't have this attitude in PA, it won't work out. So you have to promote this way of working, in order to influence the culture. " – interviewee #3	1
Q48	"For the changes there was open book accounting. But I don't think private parties are necessarily there yet. As an example, the winning combination had of course different parties coming together with arrangement for the losses and benefits but we didn't get any insight about the agreements within the combination. If there was only one contractor (and not a combination) maybe it would have been different. But all the bidders were combinations. " - interviewee #1	1
Q49	"I think market also has the same problem, they are not yet used to project alliancing. For example for the scope changes, I know for fact that it was discussed about not starting the change before the financial deals are arranged. Because it is very risky for the companies to have this much trust. It is about the continuation of their company. So I think they have the same problem as RWS. They work in a system and this is different than that system. But I think the market adapts faster than public organizations like RWS. Because they work internationally thus they are more flexible and more adaptive than us. " – interviewee #7	1
Q50	"I think the trust between the alliance management team and alliance board was good. But between the mother organization and alliance not so much. This was due to the fact that people in the mother organization were looking at the alliance from the traditional glasses. With that perspective, their attitude was that you cannot	1

	have this much trust for the arrangements between the parties and give so much freedom of action, without knowing the consequences of money. Because it was a different concept than what people were used to. For this trust to be created, it is important that people look at it through the glasses of alliance and not traditional contracts. And that's normal because 99% of projects is with other concept and ours was a pilot and experiment. So it is not a disqualification of another concept of working. " – interviewee #7	
Q51	"I think another reason for the mother organization not having enough trust for the alliance was that there were very limited representatives form them in it. You need a number of people who can act as ambassadors here, because we were in a separate office, location wise not so faraway but mental distance was huge. The distance between the alliance organization and the mother organizations should not become too big. Thus there is need for a critical mass of personnel and certainly what we had was not enough. " – interviewee #7	1
Q52	"We focused very much on who are we, what can we do and mixing all the people together and creating our own culture to get better results. And because we were too busy doing that we didn't have enough attention for mother organizations and that made us a bit threatening to them, they didn't know what exactly we were doing. And if we are just going our own way. We had to operate on ourselves. We were responsible for the realization of our projects, within our budget and time and limits of the contracts. So we did that but all the parties around us were thinking what we are doing and thinking if their interest are taken seriously. " - interviewee #5	1
Q53	"The connection between the alliance and the mother organizations was so distanced that they saw us an independent party and not a party that is made of them and representing them. So first we had a distance, after one year we saw that it wasn't working so we tried to get closer to the mother organization. That was a big lesson. We were focusing on self and forgetting mother organization. So they became more and more critical of us. And we had so many discussions with RWS and market parties who put a lot of pressure on us. This led to little trust on the outside for the alliance organization. We had great relation with stakeholders but mother organizations were the hard part. " - interviewee #7	1
Q54	"Another issue was for example is the disagreements between us, as in the alliance and some people within the organization. The decisions we made were not accepted by them. So if you don't accept the decisions being made within the alliance, then the alliance won't work. " – interviewee #7	1
Q55	"For conventional way of doing things, you have two parties (Principal and agent) but in alliance in principle you have one party for the project (the alliance) if it gets approval from those parties. But we had disagreements from the mother organizations and thus suddenly we had three parties. If everything goes smoothly, well there is no problem. But as soon as problems occur, people in the mother organizations get nervous. So they will interfere, and try to influence the decisions we make. Luckily we had a very close bound with the people in the alliance and stuck together but such interferes have negative effect on the performance of the alliance. " - interviewee #7	1

Q56	"People within the alliance had to prove themselves since everyone was looking at them but the main stream around the alliance was that it is not going to work. It was mainly their drive that made it a success. " - interviewee #5	1
Q57	"in A2Hooggelegen, the main negative aspect was that the financial balance in the end came to zero. Therefore the financial benefit that was anticipated in the beginning was not achieved. On the other hand there was no loss. " – interviewee #1	1
Q58	"There were some problems with the financial arrangements of A2Hooggelegen; firstly, despite having a transparent cost structure, the discounts that the contractor receives, either from past cooperation or the promise of future cooperation was not accounted for in the arrangements. Thus such benefits went directly to the contractor. Secondly, there were a lot of discussions due to the percentage of alliance fund and who should provide for it. For us it was implied that both parties put half and half but for the contractor consortium it was implied that this alliance fund is provided by RWS as a bonus in case of success. And at the end the contractor claimed the mutual fund. In general financial arrangements for the alliance were not clearly defined and caused lots of discussions and were solved only one and a half year after the contract. In the future, such arrangements should be better planned. " - interviewee #4	1
Q59	"In the alliance, the work that needs to be done will be done first, and then the financial arrangements will follow. This is possible with mutual trust. But if it takes a long time for the financial arrangements to follow, some companies might not be able to handle the lag. Especially due to the economic situation and common bankruptcies. So I think the procedure was too slow, it could have been faster. We were too focused on managing the problems that we were slow managing the contractual deals. So finance did follow but it followed to slow. " - interviewee #7	1
Q60	"one problem in the technical aspects of the project, was that the river side should have been covered with grass, decision was made to make it green for the design but maintenance wasn't considered and due to being too steep, even to this day it is not covered with grass. Then there was a lengthy discussion whose risk this is. This is a good example of life-cycle considerations. This issue could have been avoided if it was better considered. " - interviewee #2	1
Q61	"I don't think the selection procedure was complex, it was however unordinary due to group assessment via the workshop and simulation game. This criterion was based on the interaction of people with each other and it cannot objectively be said that this behaviour scores 6 or 7. Therefore it was very subjective. But I think the winning party was not the one who scored the highest in the workshop. And also the losing bidders would usually come up with such critics." – interviewee #1	1
Q62	"In the contract phase the idea was to provide the alliance team our own office, so we had a building, which RWS hired for three years but was being paid from the alliance fund. It had two floors and the first thought was that the personnel of RWS will work in the first floor and the contractor's personnel on the second floor, and we had locking door systems for each floor. Thus separating the personnel on the work floor. But what happened was that we had a whole floor with facilities and furniture for	1

	about 5 or 6 people but 2nd floor had about 80 people with no integrated computer network with us. We saw it wouldn't work so we mixed, and worked really hard to get on one server. Once RWS found out they weren't happy with this. So we were forced to separate our servers. Then we asked the contractor to create a system and location to work on our own. That building that RWS hired, we had to pay for it and it was extremely expensive, so we moved in the facility of the contractor at one location and sat there together. We were not connected to RWS's network anymore. Since this was not possible according to the regulations. " – interviewee #5	
Q63	"In fact for automation, it was finally decided that it is not possible to do the automation procedure or accommodation within the RWS's facilities. And therefore as RWS, we went to the facilities of the contractor. The idea was to create a mutual network. This can be seen as a practical problem, which was due to the rules within RWS concerning the confidentiality of the documents and buildings." – interviewee #1	1
Q64	"The financial part was open-book accounting but in this system, the discounts that the contractor receives, either from past cooperation or the promise for the future cooperation, are not accounted for. Thus contractor might be receiving a surplus which is not mentioning to us." – interviewee #4	1
Q65	"There was a budget that we had to operate within and it was coming from RWS, but every time we had to order something or pay the contractor, it was going to RWS for authorization. This proved to be difficult in the beginning to get used to. The project team could not spent any money directly." – interviewee #5	1
Q66	"There are many benefits for PA, such as the integration of two parties which make the process for decision making very fast and flexible. Usually the agreements in the contracts are black and white, so when something unexpected happens, the parties stand oppose to each other. But in PA I saw that the problems were solved in a consensus manner between the managers so we had less contractual discussions. Also the communication lines were shorter. Procurement was fixed price and the scope was not really clear but it was not a problem, because almost every major project is not build the same as it was procured. Changes are inevitable. But alliance made it easier. That is one of the biggest advantages of PA. If we had D&C contract for A2, we would have contractual discussions all the time. For design process also I think PA is the strongest, since not only you will get a life-cycle view (unlike D&C), but also the client will be involved in the process to ensure its adequacy (unlike DBFM). And being involved in the process is of great importance to safeguard the interests of the users. " – interviewee #2	1
Q67	"Aspects such as being within budget and time are good and unarguable, but soft factors such as trust and having a good atmosphere at workplace are difficult to explain and convince. Thus it should be seen if people really see value in those soft factors. Of course nobody will say that a good atmosphere at work is bad, but do they see value in it? And if so, how do you compare it? It is not easy to prove the relation of good soft aspects to hard results. To me, since you work a great deal of the day, the human aspects are very important but also since such aspects will help improve the overall performance. However we are in an organization with a technical view, people find it very hard to manage human factors, so we don't pay enough attention to them. Therefore what happens is that at the end of the projects, only the measurable results are important, such as time and cost, but how to get there is not their concern. " –	1

	interviewee #5	
Q68	“I don’t know if people see more value in PA or not, but if you look at a lot of projects, you see that time and cost overruns, claims and disputes and etc. are big problems and it seems alliance help control those aspects better and help projects go smoother. ” - interviewee #5	1
Q69	“To me success is not only about being on time and on budget, but also for people to go to work and enjoy the work together. ” - interviewee #3	1
Q70	“If it is not measurable, then it will not be considered as an advantage, for example, in my role in the alliance, if I did my job good, there would be no obstacles, so the obstacles would be avoided. But if no obstacle is seen by the people, then they will think that I was lucky and had it easy. Thus being ahead of the time will work against you. On the other hand if I wait for problems to occur, then solve them, it would be more observable. ” – interviewee #5	1
Q71	“Another issue is that everyone thinks their own project is a success, so to prove it, we started by summing up our measurable results, because that’s what people want to see. KPI’s were all positive. Also for the presentation we started with those hard results, and then talked about the process and the way to get there. ” – interviewee #5	1
Q72	“There is only one good example in our case and if you only have one experiment, people will not be convinced. One swallow doesn’t make a summer. ” – interviewee #5	1
Q73	“This has also been the case for DBFM contracts, in the beginning it was a pioneer move, but now it has become a standard delivery method. I don’t imagine it would be any different with PA. If some standardization process be applied to PA, I think it would become a standard contract within 5 years. ” – interviewee #1	1
Q74	“If you have a standard procedure, then it is not being perceived necessary to go a bit further than that to form an alliance for the added value. For this purpose it is important to have ambitious project teams that are open to new methods otherwise it will not be chosen. ” – interviewee #1	1
Q75	“Since PA was an exception, it needed to receive all kinds of internal authorizations. Not only this would put restrictions on the project team, but also since there is no standard policy for PA, you need to do everything from beginning yourself. For the contract of A2Hooggelgen, we had to arrange and write everything from scratch; therefore it is a lot of work. It is very exciting to do, but the time and maneuver space to do it is not being given right now. For conventional contracts, you just need to fill the standard framework, and for a new contractual model, you have lots of research to do. ” – interviewee #1	1
Q76	“There is an assessment framework (Afweegkader projectallianties) for consideration of projects for project alliancing, but it is not yet being used. Therefore currently there is no question being asked anywhere in the processes, whether we should use a project alliancing or not. For PA to be truly adopted, an option in the procurement assessment framework should be placed for it. ” - interviewee #1	1
Q77	“Also in true PA, your responsibilities and mandates are written out but in our case we had to make decisions without such mandates. ” - interviewee #5	1

Q78	"From the beginning, there were some accountability concerns that arouse from forming a mutual organization with the private parties. When it was decided for an alliance contract, initially it was considered to start a mutual company with both the client and the contractor that would be responsible for the whole project. This however was against the governments accounts act (comptabiliteitswet). Thus it was decided for a non-legal entity instead. " – interviewee #1	1
Q79	"From the beginning there was emphasize to keep the client-contractor relationship and build our alliance on that. Thus no legal entity for the PA organization, just an informal one. " – interviewee #4	1
Q80	"I believe in order to have more PA, there should be a champion or pioneer for it in the organization, as it was also the case for A2Hooggelegen; at that time there was a director who really believed in PA and due to his function, he was able to set it forward. So you have to have a sort of godfather for it to make it possible. There were also other people interested in PA, but someone has to stand up, otherwise it will not be implemented. And when the movement has begun, all those who were interested will also help to make it a success, but a champion should be willing to take the first step. " – interviewee #5	1
Q81	"There are only two possibilities for PA; either the directors appoint some projects to be implemented via PA or project teams consider PA a project delivery method and consider it in the assessment procedure for selecting the right contract form. The latter requires motivation and initiation from project teams. " – interviewee #1	1
Q82	"In the past years, there were talks about some projects to be implemented via PA, but eventually the project teams chose other contract forms. This can be due to people not willing to take challenges, but to overcome this; they have to be motivated somehow. " – interviewee #5	1
Q83	"In the 'contractenbuffet', PA is mentioned as an option, yet there has not been any initiation from project teams to form a new alliance with the market. For this to happen, people should be convinced and motivated, there has to be a clear reason why PA would be beneficial. It is not about telling them you should do this, but to convince them it is better to do this. " - Interviewee #3	1
Q84	"Since there is no standard framework for PA, currently if project teams want to choose PA, they have to be really motivated to initiate it and accept the challenges. " – interviewee #1	1
Q85	I think our project should have led to more PA's in PNH but it appears that they are still not ready for it. However I am convinced that eventually it will go through, even though it goes very slowly. – Interviewee #9	2
Q86	Back in 2006, RAW contracts were mostly used in PNH, but now the policy is more directed towards D&C contracts. – Interviewee #10	2
Q87	We don't use DBFM so much in ProRail, it doesn't fit in our network, finance and maintenance practices. Because we have a very complex maintain network for the	2

	rails compared to RWS and roads. For finance, there is pressure from the ministry of finance (for RWS and ProRail and other public entities). For example we also have to make a public-private comparator and explore the possibilities. But the situation in rail and road is different, thus the outcome is different. For us the financing usually comes from the municipalities. And therefore PA is a very good solution. – interviewee #13	
Q88	I think RWS has invested a lot in DBFM. On the other hand ProRail has always said that we don't want DBFM. Mainly because every couple of kilometers you will have a new maintainer for the railways. And this is a much bigger problem than with roadways, because on the rail, if you do something at one point, it will have direct effect on other points much further. But for roads this is rarely the case. Thus I think for RWS, the network can be more disconnected. ProRail has from a long time ago said that as the manager of the railways, we don't want such disconnected network; therefore no DBFM. And consequently PA clearly stood out as the appropriate PPP model. – interviewee #17	2
Q89	We are purely procurement organization and we don't do a lot of engineering work ourselves. But there is a balance, we had a situation that we purely focused on procurement and all the work was done by engineering and constructing companies but we came back from that, you need enough knowledge in your own organization to be a good client. – interviewee #13	2
Q90	I think that PA in the first phases of the contract will need additional investment if you compare it to D&C contracts and this additional investment will be earned back at the end of the project if the alliance works. If the size of the project is small, then you might argue that the investment for initial phase is also smaller. But the win would also not be that big. If the potential benefit area is small, then it might not be worth it. But if the size of initial investment is actually smaller for smaller projects, we have not yet investigated that so it's a kind of reasoning that is based on assumptions. But we do think for small projects there is not enough room to improve. – interviewee #15	2
Q91	In my opinion, a project should conform to a certain characteristics to be suitable to be realized via PA, and if you look at PNH, you don't have many projects that conform to those characteristics. It should for example have a considerable scope, risks that can be better managed if shared. - interviewee #9	2
Q92	On the other hand, PNH recently started a large project with conforming characteristics for PA, Westfrisiaweg (2013-2017) that it is decided for another approach, D&C via BVP. – interviewee #9	2
Q93	In regular alliance we have a whole project organization and this is not possible to set up within a small project due to costs and resources necessary. Thus there is a limit that under around 40 million euros, this model is not suitable. On the other hand, there are two piles for alliances; sharing the risks and optimization. Every project, small or big has risks that can be managed better if shared. Such as risks when one party can influence the probability and the other the consequence. Thus I think in every project there is a potential alliance component. And this is not dependent on the contract type. So what has happened within the past couple of years, a concept called mini alliances was introduced for D&C contracts. In the standard D&C contract we have two optional clauses about two things: sharing of	2

	risks (create mutual risk pot) and optimization. For optimization adjustment of requirements is needed which as contractor in a D&C contract you are not easily able to do, or if you do, you might bring negative consequences for yourself. But in mini alliance concept, we say that we are going to look at this optimization and assess it, if it is possible we will do it and we will share the financial benefit of it. This is something that is automatically done in a PA, but now with this mini alliance concept can also be used in D&C.- interviewee #17	
Q94	The budget of our project was about 50 million euros. And we had a much smaller project organization than compared to for example Betuweroute. Our much smaller scope made it in this sense a pilot project to see whether project alliancing can be beneficial in the smaller projects. Thus to adjust our organization accordingly and have lower costs, our project organization was the usual size that ProRail had for other contracts but we did it with alliance. Thus some double roles were created, for example the role of project manager of the project for ProRail and the alliance manager were fulfilled by one person. But the same was the case on the side of the contractor; the manager of the contractor also became the building manager in the alliance. This helped us having a quite small organization, including the engineers 20-30 at most. We tried to keep the alliance staff full time in order to stimulate better culture between the people and develop better relationships. Small group of people know each other good. This was crucial. This is possible in small projects. But OVSAAL is a larger project so they have more staff and larger organization. I think it is not possible to manage it the same way we managed "Bataafsealliantie". You have a scale problem on that. So I do believe in small alliances; 30 to 100 million. Bigger than this you will get scaling problems and you will also get management layers within your alliance organization. – interviewee #11	2
Q95	I think the majority of people wanted PA. At that moment from the politics, PNH was pressured to try new contract types as it was also happening in the other parts of the Netherlands.- interviewee #9	2
Q96	We usually have a lot of stakeholders, not only government but also local municipalities. These stakeholders may think a PA is too much of an experiment for their projects. That can also be a barrier. So you have to convince these stakeholders why PA is better in a specific case. – interviewee #15	2
Q97	There were lately discussions about having PA for the project Driebergen-Zeist Station which concerned many stakeholders such as the ministry of infrastructure and environment, the province of Utrecht, the municipalities of Heuvelrug and Zeist and the Bestuur Regio Utrecht (BRU – which is a city region partnership consisting of 9 municipalities). And people from the ProRail's project team came to us to ask about our experiences and opinions about PA. Despite the enthusiasm of the project team towards PA, realizing it via PA was rejected somewhere in the process. – interviewee #14	2
Q98	ProRail is a B.V. (company) 100% owned by the government but RWS is part of the ministry of infrastructure and environment. Therefore there are tighter regulations for RWS than ProRail. – interviewee #11	2
Q99	Within prorail it is analysed and observed that DBFM delivers more disadvantages	2

	than advantages. We had a lot of discussions about this with ministry of finance and infrastructure over a number of years and I think now we've gone to a sort of status that it is accepted by them that the context, structure and related aspects of railways is very different from the roads and it is not wise to go for DBFM. So we have actually convinced the politicians. – interviewee #15	
Q100	The contract partners in the alliance have to show behaviour that they can be trusted with transparency, but when there is bad market situation due to the recession and the constructor has financial difficulties. For their continuity the money has to come from one or the other side, that's the problem for the market parties, the situation we have now. So I think this is not an easy situation for alliances because there is currently not enough money in the contracts. – interviewee #13	2
Q101	Another important influencer can be that we went in to recession in the years after our project and the position of buyer is stronger. And thus they can have their projects cheaper by traditional way since the private parties have less negotiation power due to economic conditions. Since the contractors fight for the work and often submit bids lower than what they find fair. – interviewee #11	2
Q102	Despite having a balance on the management level, all the personnel representing PNH in the alliance were hired staff, thus no fixed personnel from PNH in the alliance. Also on lower level there was a misbalance of personnel. – interviewee #9	2
Q103	People representing PNH were not involved in the PNH organization and from the beginning of their contract were put in the alliance organization and location. Therefore they had no PNH "organizational blood" thus despite representing PNH, it can be argued whether they had enough insight about the organization itself. Also this makes the communication lines and connections quite long between the representatives of PNH and PNH organization. Thus despite initial expectations, the involvement of PNH in the alliance was very low and they were distanced in my opinion. When people who have for example 20 years of experience within an organization and are put in the alliance, they know the policy and rules and culture and mindset of that organization, thus they will have a completely different view on matters than what an external staff might have. – interviewee #10	2
Q104	If there is a next project, there should be more people from the province itself and not hired staff. Otherwise the knowledge and experience will never be brought back to the organization. And now after the end of the project, almost no one of the PNH representatives will stay in the organization, since they are external and will return to their own organizations. And this is not restricted to the PA part, but the whole program is almost entirely staffed with external personnel. – interviewee #10	2
Q105	When Betuweroute started Our minister of transportation at the time was convinced that market will be delighted by the new railway and there would be a line of companies who would like to do the operation of the rail. ProRail is government owned, in the first years when the project started, they weren't supposed to do the management of the rail. Thus there was this attitude: if we don't get the operation of this railway, then we won't staff it with our own personnel. That's why there were so many external people staffed in the project. 4 or 5 years in the project, it became clear that there weren't any companies eager to do the	2

	management of the Betuweroute, so the project in the end came to ProRail itself. But then ProRail realized they need the experience of the people who worked in the project (external staff) and we have to extend it to our own projects and keep the knowledge within the company. – interviewee #11	
Q106	In an alliance, it is important that the parties have equal power on all the levels; this will promote better team working. For this purpose, having an external alliance manager who is brought in by both parties could be very beneficial since it creates a power balance in the alliance organization. – interviewee #10	2
Q107	Between two parties who don't trust each other. Our way of contracting a project is out of the position of buyer and seller; there is a power distance between them, the buyer having a lot of more negotiation power. This causes the negotiation phase to be a struggle for the seller, but after signing the contract, we expect those two to have a very nice cooperative way of working. And this is difficult coming out of such a contracting period. That creates distrust between the buying parties and the seller parties. Developing a true cooperative trust culture after such struggles is very optimistic and naive thinking. Having an external alliance manager gives the opportunity to be the trusted party in the middle. I think this was a success factor for Waardsealliantie and Bataafsealliantie. – interviewee #11	2
Q108	In our alliance, on the management level there was a balance between the personnel but in the lower level, due to lack of capacity in ProRail, there were no staff from ProRail.- interviewee #11	2
Q109	For us the design team was quite big, without them we have 22 staff but at the height of design phase we had 60-70 people. Our alliance organization is made of about 20% from the ProRail staff. The balance is very important. I think norm of 50% is good. Also to get acceptance from the organization, you have to be well presented. You can fill the alliance with people who represent ProRail but are from independent parties, but to get the acceptance, you need people who are actually from ProRail. And it was difficult for ProRail to supply those people. They underestimated the importance of their role within the alliance organization. This worked very much as a setback. It would have helped us if this was better arranged. I believe both underestimation and lack of resources caused this issue. – interviewee #12	2
Q110	Compared to D&C contract, more staff is needed from the public organizations in the alliance and for ProRail it is difficult to provide enough personnel for a good balance. On the other hand, having a balance is very important, so when ProRail says we want more PA's it should look at how to deliver more people for it, for both technical and managerial aspects. – interviewee #13	2
Q111	For example in the surrounding and stakeholder domain, there are at least four positions that could have been filled with ProRail's staff. But ProRail didn't had the capacity for or maybe some other reason. Therefore external advisors were hired. But if it was filled by our staff, then they would also act as ambassadors of PA within the organization. In the alliance there were around 5-6 people from ProRail while at some point there were around 60 people in the alliance organization. That's not very rare since for example for the design, market is more capable than ProRail but this makes the	2

	balance within the alliance troubling. – interviewee #14	
Q112	Each personnel allocated to the alliance organization should have a clear added value for it; therefore the focus should be on the expertise of parties and their personnel. For public procuring organizations, such as ProRail, this expertise is mostly in the domain of surrounding and stakeholder management, and not in the technical fields. Therefore providing more personnel should be done according to these considerations. But why providing enough personnel for the alliance organization is difficult for ProRail? This is the question that received three different reactions from the interviewees as is mentioned below: Now there is pressure on us to reduce our organization. This balance is always a struggle, a period with more room to grow then a period with pressure. This in my opinion makes providing the personnel difficult for us .- interviewee #13	2
Q113	For the capacity in the alliance, one reason could be that the public organizations are shrinking but another reason can be that people don't want to work in a shack probably much further away to their home than their current office. This is something totally practical but does have influence. This is completely a different story than the shrinking public organization. Therefore very little to no people would volunteer to go work in an alliance. - interviewee #14	2
Q114	At the height of the alliance we had more than 100 people but at no single moment we had more than 4 real ProRailers. There were some people who were hired by ProRail but even with those the number is not close to being balanced. When we ask for more staff they say we can't deliver. Also some people find excuses not to work in alliance because they say we don't want to move to Amsterdam, or we don't want to work in a shack! And all sort of excuses. – interviewee #17	2
Q115	For the personnel of alliance organization, it can't be anyone. You have to select people that believe in it. Big part of the alliance in my opinion is about people and how they interact and communicate and the soft skills. Thus getting the right people on the job is crucial to the success of the alliance, this also means getting the wrong people off the job. – interviewee #16	2
Q116	I think for PNH, the attention is focused on adopting D&C contracts. In the past 5-6 years, their main PDM was via RAW contracts, but you see that in the past recent years they have started to change their approach towards D&C. – interviewee #10	2
Q117	I have the feeling that the approach of having PA is somewhat replaced with other approaches such as best value procurement and that sort of procedures. It seems that PA was in 2010 and now the trend is a new thing, the mode of the day is changed I feel! – interviewee #14	2
Q118	With the success of Bataafsealliantie I was expecting more PA within ProRail. And despite Patrick Buck (the director general of ProRail) being in charge of ProRail, there is a level of managers with the traditional way of thinking that believe working together is good but their definition of working together is for ProRail to dictate what contractors should do and they do it. – interviewee #11	2
Q119	I don't know if it's a matter of not wanting or what else but for OVSAAL project, it was clear that it would be a PA from the beginning. Thus people were gathered that were willing to experience PA. – interviewee #14	2

Q120	I was not involved in the project at the beginning but I know PA was unknown within the organization. My predecessors had a lot of presentations within the PNH, about what project alliancing is, how it works and the benefits and etc. therefore I think one of the main challenges was to convince people and get their acceptance for PA You also see that very few people from the province itself were involved in the project. And all the people who were representing the province, were actually external staff hired by PNH. Thus they took the knowledge with themselves after the contract. – interviewee #10	2
Q121	The knowledge level in the beginning was troubling; the knowledge of contractor's staff was much higher than the people from the client's organization. There was a misbalance in the knowledge level. The progress of PA in the future depends on educating the people, people's knowledge and experience. People are always scared of the unknown. – interviewee #9	2
Q122	A big problem is that in most pubic organizations, there is still not enough information about this new contract form. This will among other things cause the contract between the parties to be crooked, thus leading to the problems further ahead in the partnership. A main challenge was that the designs prepared were supposed to be approved by PNH but there was a delay. Misbalanced knowledge caused difference in the interests and consequently mistrust. And we tried to balance that. The knowledge level of both parties should be more balanced. I know it is difficult for public organization to (partly) transfer the control to private parties. But otherwise, it will not even be possible to do simple tasks in the alliance. – interviewee #9	2
Q123	Some of the private parties were also involved in the Waardsealliantie, thus they had the experiences. But in my opinion the private parties will claim they are ready for PA but in reality they are also not completely ready and experienced for it. – interviewee #10	2
Q124	We don't have enough people with enough knowledge of the principles of alliance and how it should work. Because in ProRail there are only a limited number of project alliances and we don't build our skills enough for that. That's a problem and could be a barrier. – interviewee #13	2
Q125	You need to work within an alliance to understand its benefits and how it works. People understand how contracts work if you explain it but to truly understand it, is something that can be done from experience. – interviewee #16	2
Q126	You have to build skills by doing it. But you can also have basic knowledge to instruct your people and give them a good base. You can't learn it only by theory. You see this in all changes in the contract form. In the Netherlands we started in the infrastructure industry with D&C in around 1995. What you saw in the first years, the change from the traditional contracts to D&C cost a lot of energy. Everybody who worked in it knew about the theory but you have to experience it to become in control with the new structure.- interviewee #13	2

Q127	There is a fear of unknown associated with PA. If people don't know what it is and how it works, they will do anything to avoid it. This is in my opinion the biggest barrier for PA in ProRail. – interviewee #17	2
Q128	Lack of experience for both me and other people within ProRail with this contract form is a setback. This is especially from the ProRail's side than the contractor. Since one of the private parties involved in A2Hooggelegen project of RWS is in the combination of our contract, and they came to help us with the project and shared their experience. It enabled us to have a very good start. And on the management level within the combination were people from A2Hooggelegen from the contractor's side. So this helped bring more experiences in our alliance for the private parties. So I think just because of A2Hooggelegen experience, the private side was more ready than us for PA. – interviewee #12	2
Q129	Even though we have done many PA's, for every project team it is a potential innovation. So if you've a project manager that has done this before, and will convince his project team that this is the best way to do it, then there is no problem. But bigger projects may take several years, so for one project team to get the experience of a PA from their project, several years are needed. Therefore you need a lot of time to have the needed experience in your organization. – interviewee #15	2
Q130	Alliance is a big container word, someone that is very contractual by nature can see alliance as a risk sharing and mutual pot partnership and someone with focus on interpersonal relations sees it focused on soft skills and cooperation. But I do believe that on a higher level there should be common view on PA. – interviewee #16	2
Q131	When we talk about project alliances, there is no common view on what it is or what it isn't. So it's more of a container kind of name. And what I find essential is at least it should have a pain/gain mechanism in it. For me pain/gain is the core of PA. – interviewee #15	2
Q132	For me PA is a legal contract and the structure is important. Legal arrangements to share the burdens and benefits are important characteristic of PA. – interviewee #11	2
Q133	For me PA is just a form of cooperation, and I don't believe it should be per se model A or B or C. I believe just choose the form that fits your needs and culture of your organization. It is more of a mindset to me not a contract. - interviewee #14	2
Q134	Theory of innovation graph (figure 15) is that there is a tipping point that makes the lagers also adopt the method. If you position ProRail we are somewhere in the "early adopters" section, with a limited number of project managers that would sponsor the concept. If you look at RWS, they are at the very beginning. It should go to the tipping point for PA in order to become a tool and not just experiment. And by the experiences you can improve the contract and that will accelerate the process. So this graph only shows one aspect of it. What will make this happen? I think champions, people with high status and influence within the organization, are very important. These people should motivate others for PA. – interviewee #15	2
Q135	There is still a "we vs. they" mentality from the organization's point of view, as if the	2

	alliance organization is a completely different party with no interest for PNH. You can still see this from the stance of organization. If there had been any problems with the project, PNH would see it as the fault of "they". And they don't see PNH as being virtually a shareholder of that. If for example we are direct colleagues and I go work in the alliance, I believe it would help more with this trust than if we are not colleagues and I'm externally hired to work in the alliance and am put directly in the alliance. There is no trust especially from the point of view of lower management about what has happened. Thus as a consequence I think the interaction was not always optimal and in the general I don't think such interaction was what the province initially wanted. - interviewee #10	
Q136	The involvement of the PNH as an organization, specially the back office of PNH was very limited. The distance was too large. In this project, we formed a project organization. But this project was itself part of a larger program N201+ which also had a program organization (mostly from external staff) thus the link between our project organization to the PNH was through another program organization. And people within the province saw a new organization for a new contract form as a real threat. This distance with the organization mostly showed itself after the project delivery (transfer from project organization to province); after this period, the project will be maintained by the province but for an optimum maintenance and life-cycle considerations, maintenance staff should be involved in the project from the beginning. Furthermore distrust from some levels of the organization led to us not receiving enough cooperation. This has to do with people thinking that their own position is in danger, due to the PA. – interviewee #9	2
Q137	In our project we had a large scope change were a substantial amount of money was required. This puts the relationship of the contractor and the client in stress, but also the relationship of alliance and the client, since by change in the design we also needed more money to prepare the new designs. And what you see is that due to such changes, there was a mistrust formed between ProRail and the alliance; leading to skepticism whether this amount was fair and honest. Fortunately it is now behind us and that's good. But we are still handling a similar situation with small changes within the project that is normal for almost every project. So if we as the alliance who are supposed to be half made from ProRail, approve a change order, ProRail should trust us with the numbers and not say I see you now as the contractor therefore I will double check it myself. This again has to do with the control culture. And will bring about problem for the alliance since one of the aims of alliances is to become more efficient but with this issue it will not happen. – interviewee #17	2
Q138	Support for us was alright but trust was an attention point. Especially in the phase that scope is uncertain, combined with the fact that the alliance was put up as 50-50 organization but ProRail had difficulty providing the right personnel. Thus we lacked some trust of the main organization. It also has to do with the fact that alliances are rare and mother organizations are adapted to D&C contracts and the mindset is different. There is this impression that we, as ProRailers within the alliance, are being considered as contractors from our own organization. Most of the time it is not intended but people are used in that mindset. So in my experience maybe a little lack of trust. I think if the scope was stable, it would have been easier. To give you an impression of the scope changes, the contract sum is almost doubled between	2

	the initial contract and the new scope that we have now.- interviewee #12	
Q139	The construction is not done by the alliance but is done by the contractor alone, and the dividing line that traditionally happens between the client and the contractor should not be replaced with a new dividing line between the alliance and the contractor. Because basically the alliance is the client to the building team of the contractor. So there should be a balance not to displace the problem; the client has a problem with the contractor and then you form and alliance then the alliance has a problem with the contractor. Then you are making it worse because you've got a dividing line between the client and the alliance and another between the contractor and the alliance. Strictly speaking you are working for a project organization with specific goals (i.e. whatever is in the contract). Therefore you are not working in your mother organization. If you are perceived as external from the mother organization, then the benefit of PA is reduced. Part of the benefit is that you can get things done more efficiently when you "smell" like a direct colleague. It could lose its advantages if the mother organizations cut their ties with the alliance and detach it. The alliance exists because people still see you as their colleagues and that has to do with the trust. – interviewee #16	2
Q140	In principle, we thought by having a PA, the conventional large interface between the client and the contractor which is usually problematic would be converted to two smaller interfaces with less discussions; however in reality we had lots of big discussions in the two newly formed interfaces as well. – interviewee #15	2
Q141	In the first years I was only working in the alliance, but now I have other responsibilities within ProRail as well. But it is a danger that if you are in the alliance, as it also happened to us, you are being seen as external personnel. To avoid this problem more people from ProRail should be set in the alliance from the beginning. And about the link, it depends who you ask the question, from the documents it seems that it is representing ProRail quite well but I think if you ask people, many of them see it as an external entity. – interviewee #14	2
Q142	There were some problems with the railways, Buitendienstelling (out-of-service-period), which is handled by another department of ProRail. We negotiated and reached an agreement but afterwards we were supposed to send the contractor away which is very costly. Then we contacted the director of ProRail informing him about the problem we were facing; the project is going good but our own organization is bringing us problems. This time with the help of alliance board team we managed the issue quite quickly. By having the director general of ProRail in our alliance board team, we were linked to the highest level. This was very helpful to overcome distrust and gain support for PA in our project.- interviewee #11	2
Q143	For a long period we had monthly meetings with the alliance board team that we used to present the reports to them. If there were questions or problems we would also refer it to them but such cases were really limited. – interviewee #9	2
Q144	The aim of alliance board team is two folded in ProRail: they are escalation level and they are supervisors. Escalation level means if there is an issue in the alliance team and we can't solve it	2

	then it will escalate to them. We try to do as much as we can ourselves and not go to them with open questions. But if you look at it critically, I would say the alliance board team in the past couple of years was too little involved. I think in the ProRail ABT is seen as an artificial title, but contractors are more used to such role in the projects since in almost every large projects, contractors work in a combination, and they always have a combination board team, comparable to ABT. However I think recently it got better, two reasons: we had more talks within the organizations about what they expect from us and what we expect from them and what alliance agreement says about the role. Also since there is a new member in the ProRail's side, and he is more involved I believe. On the one side I understand that the directors cannot be too much involved in the project but on the other side it is necessary for them to know what is going on and critically review the performance. So what can be said is that before, the communication was mostly one sided from alliance team to the ABT. – interviewee #17	
Q145	I like to be self-supporting in the projects, if there are problems and I have to go to alliance board team I will do it but try to keep it to minimum level required. From the beginning the successes were obvious and we reported to them showing the project was on the right track. And they didn't have to worry about it. We had monthly meetings in the beginning and afterwards every quarter. These meetings went very good since every time they visited we had more good news. – interviewee #11	2
Q146	There are two sides in development of PA: a project is unique so the contract should be designed uniquely but also there is the side that you want to build on the previous experiences and developing without any reference to the previous experiences will be a loss. So you want to know what works and what doesn't. I think a lot of issues should be explicitly discussed and decided upon and then try to go to a deliberate development process instead of every time creating something new; with attention to uniqueness of projects of course. – interviewee #15	2
Q147	Our contract was based on classical D&C contract. Design and risks were taken out and put in the alliance. That was the basis for the alliance. So we had no standard contract beforehand. When they contracted this, there was a very strong fallback option for D&C contract. Procurement of the alliance proceeded very careful to be able to use the fallback option on D&C at any moment. They progressed at very small steps. I think the uncertainty of whether it will work and what kind of responses we will get from the market caused this. And the time pressure for the project made it impossible to have failure in the contracting phase. So they feared if this strong fallback option was not implemented in the agreement, they would have to restart the tender in case of failed negotiations. Also because when you have to start with a blank page and develop ideas about it, it costs a lot of more time than when you have a standard contract for D&C contracts for example. The alliance contract itself was new but all the things around it was taken from existing contracts. In ProRail we have a request specification of contracts, but the part about PA is very limited. – interviewee #12	2
Q148	Before OVSAAL, agreements were prepared from scratch because there were no PA	2

	agreements before it. But in the future agreements of OVSAAL might be used as a basis. – interviewee #17	
Q149	ProRail is an organization with more than 4000 personnel, each in their own domain and corner. We as the alliance have done our effort to spread the experience but for the contract form to become more familiar, that's something we as the project team cannot do much about but the people whose work is more concerned with contract forms should do this, for example the procurement department in ProRail. – interviewee #14	2
Q150	Before this work was put in the market, the province always worked with RAW contracts. Therefore the road operator/maintainer had a list of specifications that I have this sort of lamps and that sort of pole and etc. that was in the whole province the case. But a D&C contract of PA with function specifications doesn't include detailed specifications about the sort of lamps or poles but rather that we want such lighting. This provides the alliance more freedom of design. But now there are different poles in that project than the rest of the municipality that conforms to the same lighting regulations and levels but has different specifications. And this issue is being considered a shortcoming of the alliance in the eye of PNH but if there was more trust, this issue should've been seen as the flexibility of the partnership. Now they see it as: we wanted those poles and the alliance delivered the other poles thus the alliance has not done a good job. But what they don't consider is that the alliance has done a good job conforming to the contract. This sort of issues happened during the construction and even up to now. This has not to do with the PA but rather to the change from very specific project specifications to function specifications. Therefore you will for example get a different type of asphalt within one project than the rest of the province, and this causes you to maintain two different types of asphalt or etc. and this is something that people are not happy with. – interviewee #10	2
Q151	The most important thing is that the alliance manager should be involved from the moment that the contract is awarded. This way he will receive less conflict of opinions over the interpretations of the contract and agreements. This difference of opinions was a big problem between the client and contractor over the contract in our case. So it is important for the alliance manager to be involved in the negotiations of the contract. To solve these issues we had to bring back the people who were involved in the negotiations to ask what they meant by such arrangements and what their interpretations were at that time. – interviewee #9	2
Q152	In our project N201, we found large optimizations that if the province had thought about it, itself, they could have found it easily. But in our case that happened in the alliance, thus the benefit was divided 50-50. If the province had thought about it earlier, they could have gotten the whole benefit themselves. This might be seen as a criticism to people who wrote the specifications in the early phases, because this is equivalent to saying: "you should have paid more attention, because you didn't now we will divide the benefits." And this builds resistance for trying it another time in another project. This is despite the fact the PNH is used to workout large project specifications. Together with south-Holland and Utrecht, they have two third of all regional infrastructure projects in the Netherlands. Therefore I think PNH has much technical knowledge, but it could be that it's not yet enough. – interviewee #9	2

Q153	In one of the alliances in OVSAAL, the difficulties were very large and at a moment the pressure was so high for the construction company that it frustrated the alliance system. PA is based on trust and transparency and when one of the parties leaves these principles then it becomes very difficult. We had very seriously considered stopping the alliance and going back to D&C. But at the end with very intensive discussion over the issues and being very open to each other about the problem for both parties, the problems were solved. Another action was to bring-in an external specialist to facilitate and support us during this process. That was successful and now what you see is that we have very good arrangements. And if you ask me if they are doing what they said they would, I would say yes and it is going good. Therefore in my opinion it's now successful. – interviewee #13	2
Q154	I believe that alliance has more flexibility for scope changes and even big scope changes can be handled more efficiently within an alliance but also smaller changes obviously. Whether an alliance is the way for big scope changes is something I don't know because an alliance is forming a new organization which is complicated in itself and it doesn't help if you shake it up all the time. It prevents it from having a good flow and focus on the project. These scope changes divert attention on what the alliance is trying to do. So big scope changes hinder the more team-based side of it and people's interaction. Because such scope changes put everyone back to their corner and the parties really need to think about the financial consequences that it has for them. So it prevents cooperation, on the other hand the fact that you've organized it in a cooperative setting, allows for a little domestic trouble. And then there is the question of what is better? I believe projects that are very unstable should not be put on the market for PA with the hope that it will be solved later. I think all projects including alliances need to have some steady base that you can work on. – interviewee #16	2
Q155	With scope stability, it became better for us. But before, due to all the changes at the beginning of the project, we weren't able to come to our strengths as an alliance but now we are able to repair some of the lacks that we started with. – interviewee #12	2
Q156	N201 program consisted of 7 projects, 6 of them were realized via traditional RAW contracts and one was D&C which was transformed to PA later on. And what was noticed was that, except the PA one, in the others there were lots of discussions with the contractor. Not only there were fewer problems in the PA but also in those 6 projects, the lawsuits were referred to the organizations but in the PA one, due to alliance organization, any discussion was solved within the teams and not communicated to the higher level. Furthermore it was the largest project of the program. One example that could have caused a lot of problems in traditional contracting but benefited from PA was a tunnel in the project, that PNH was obliged by council of state of the Netherlands to redo some of its work but since it was within the domain of the alliance, despite 7 months of project pause, it was solved without any claims and disputes. If this was done via a traditional contract, we were surely facing a huge damage claim from the contractor. But since the alliance was in between, other construction ways were thought of that limited the cost of province considerably. And at the end, the tunnel was delivered almost according to the planned schedule. – interviewee #10	2

Q157	We had a lot of scope changes. With the closing of the contract we received another baseline for the design. It was contracted on the basis of design baseline 2 after the contract it was decided to go for baseline 3 and we started developing this baseline. After half a year this baseline3 was suspended. ProRail said we don't know what we want yet but it is not baseline 3. Three quarters of a year later we received first draft of baseline 4. Half a year later we received a second version. So there were so many scope changes and with PA we were able to continue our work. We selected parts of our scope that could be preserved and started the construction of those parts even though there was no baseline 4 design and no official contract between the parties for baseline 4. In my opinion in a classical D&C contract it wouldn't have been possible. In a traditional contract, after baseline 3 got suspended, the contractor had every reason to say: ProRail I will see you when the design is ready but until then goodbye! The contract form allowed us to continue and deliver it as a success. It must be said that all those changes cost a lot of money and in classical D&C contract I'm sure it would have cost even more. But in mindset and having a problem that is recognized by both parties, this form allowed us to move forward in the interest of the project. I think what happened here due to scope consequences was too much too handle and that gave a negative sentiment within ProRail towards PA. But these scope changes occurred due to external factors. It was kind of a battle for the contract form within ProRail. If the scope change hadn't occurred I think it would have been a bigger success for PA. So I think this negative experience affected other projects to not being contracted in PA form. – interviewee #12	2
Q158	The baseline changes in OVSAAL gave a lot of ripples within the organization. I suspect that if you would have done such a big baseline change within a traditional contract then the project probably would go in the pause mode until all the financial discussions were done and arrangements cleared. But because it was an alliance a lot of things that were not baseline related did carry on, despite having such a big change in the project. And the project got more momentum. However afterwards when the financial discussions followed there were critics that the solutions could have been cheaper. But that kept the project moving at that time.- interviewee #16	2
Q159	In OVSAAL, each piece is not very difficult or new, (it's a bridge and viaduct and station) normal structures but what makes it complex is that we have no space to build it. On both sides we have main roads; there is a metro railway and etc. It's in a much occupied area. Very large firms and important business centre. Lots of people in commute through it thus it will have a huge impact if anything goes wrong. Therefore you need a strong stakeholder management and an alliance in my opinion is positive in this regard; because you speak as one organization, instead of doing it separately. It's more direct and has transparency by knowing each other better. I think traditional contracts have always a lot of struggles almost every project give a lot of struggle and it's more against each other and the business model for the market parties is always to be sharp in the contract aspects. – interviewee #13	2
Q160	I came from a different project (D&C) and if I wanted a piece of information from the contractor, I really had to dig it out. And this is due to the contract being the holy document, making a distance between the parties. I found it a bit difficult that there is no sense of unification between the parties. And I wanted to try something to be as close as possible to the contractor to strengthen this unification mentality. Just the fact that we sit in the same shack as the contractor and our communication line	2

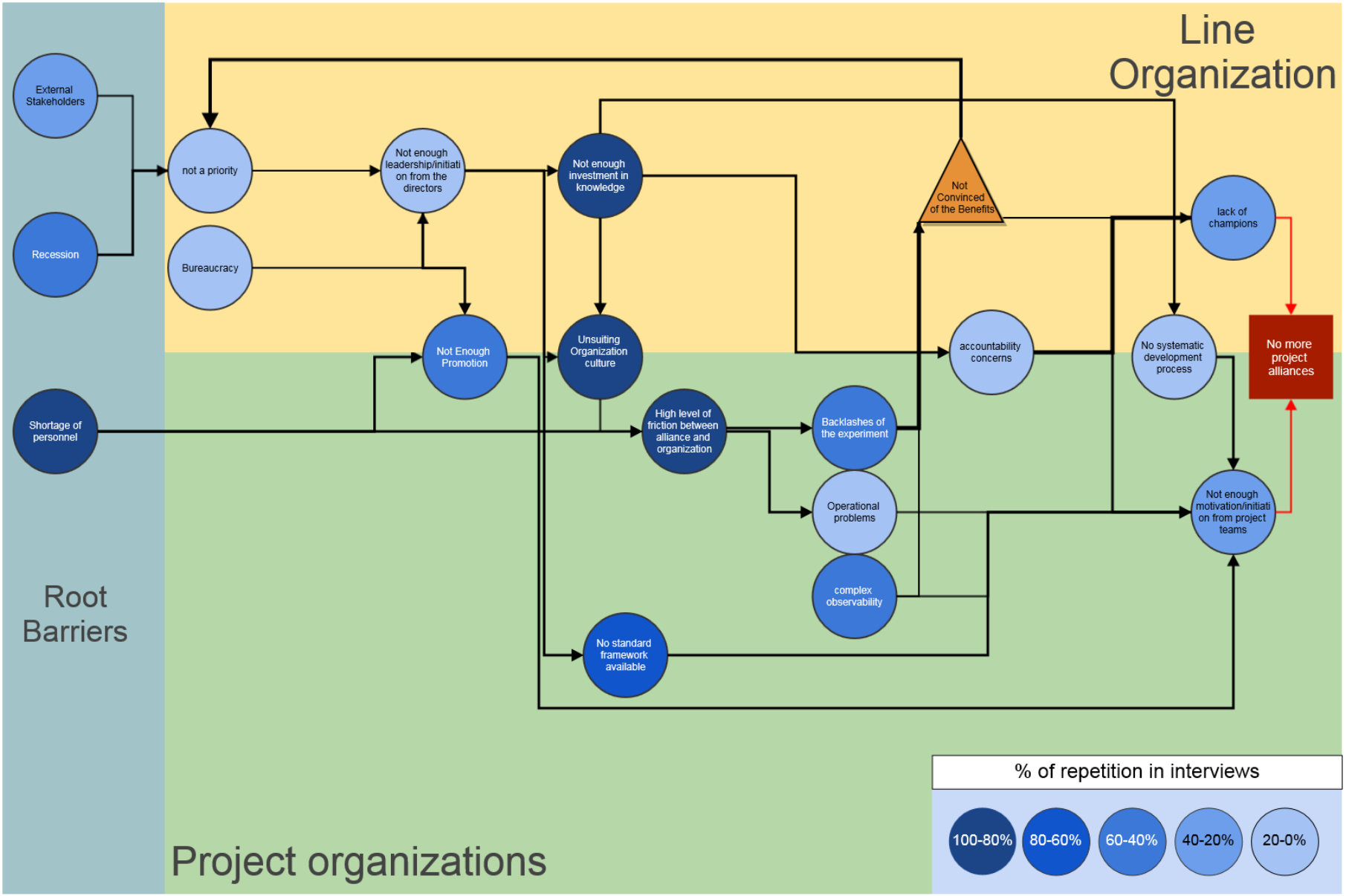
	has become shorter helps a lot to make the process more efficient. One of the main benefits of PA in my opinion is that you can be much proactive. Before this alliance, I had the expectation that this can help with such issues but it was only after experiencing it that it was proven to me, since it was my first time in a PA.- interviewee #14	
Q161	We had a large project that included 6 separate contracts; 3 traditional contracts, 2 D&C and 1 PA. We got experiences in finding out how different contracts affect the more or less similar projects. The main lesson was that it is not important which type of contracts you have, it depends on the people you have in the project and their relations. They can make it a success or not. But what we also found out was that if you have a project alliancing contract, it will make it much easier to work together and develop the required relationship; because it is dedicated to working together. You work shoulder to shoulder with the contractor. Both parties don't want risks to happen but if it does, instead of arguing what caused it and who is responsible they both work towards a solution for it right away. The risks in the project are like a fire disaster; you can argue who has caused it while it will grow more and more or you can start extinguishing it as soon as it happens and not let it become bigger problem than it already is. - interviewee #11	2
Q162	I think the main control we had was on the financial parts. I knew that for this project as a pilot to be regarded successful, it was necessary to have extra money at the end that would be divided between the parties. It was so clear from the beginning for me to control my project on the financial side. We had our struggles with the procurement department in the beginning but after they saw that we are saving more money and the project is going good these struggles were lessened. – interviewee #11	2
Q163	We started on €43 million budget and about €6 million was for alliance organization and risk budget, and €37 million for actual construction. And from the initial €43 million we eventually saved 2.5 million that was divided equally between the parties. Waardsealliantie and Bataafsealliantie both saved money on the budget but the critics believe the budget was set too high in the beginning to allow for the end project to finish under budget. Interviewee #11	2
Q164	How you deal with the risks and incidents is the main advantage point of PA. Additionally if you are working together very closely with the contractor, you can see where the project can be optimized, and where there are possibilities to be more efficient. Normally when we have a contract between the two parties, if the client is suggesting optimizations, the contractor will ask for additional payment for it. On the other hand, if the contractor is coming up with the idea of optimization, client doubts about deviating from the specifications or at best, wants to take the financial benefit itself and let the risk to lie with the contractor. But in alliance, not only you will get more insight about the possible optimizations and their consequences, but also since the risks and benefits are shared, the decision of going ahead with the optimizations are supported on the basis of interests of both parties. For example in our project, we used an innovative method for the foundation piles that saved us a lot of money. Such optimizations we did would normally not be allowed in ProRail or wouldn't even be suggested. That's why PA can benefit with optimizations. – interviewee #11	2

Q165	There are a lot of projects in the tender board for assessment before tendering, where no decision is being made for PA. Project teams and directors both can decide on PA. In principle high directors decide on how to approach the market and you see that they say we want more project alliances, emphasizing that when contracting plan is being prepared, not only look for conventional contracts such as D&C but also consider PA. In theory it is expected that finally the tender board decides on it. But in practice this is done differently: a project management with its team can significantly influence the decision for the contract type in a specific direction. If you have a project team that is more comfortable with traditional contracting, they will automatically influence the argumentations for use of traditional contracts. And for example if I sit in such team, I will try to influence it towards alliances. Now, it depends if the people in the project teams have a good attitude towards alliances, know about it and have good experience with it or not. Therefore for frequenter application of a contract type, it is important to motivate the project teams accordingly; otherwise they will keep choosing the contract type that they are more used to. – interviewee #17	2
Q166	I believe there isn't always a rational reason for not choosing PA; the internal politics, the expectations of managers, personal motives of people and the experience of project teams can all influence such decision. In other words, this decision is not always based on accurate analysis. – interviewee #10	2
Q167	What I see, is that every time we choose for PA, we have a different motive, I think this is hindering our development process because if every time for the same principle you got a different motive, then you don't know what these principles are aimed at. To my opinion it would be helpful if we agree on the motives for why we should go for PA. so being consistence in our motives for it. – interviewee #15	2
Q168	As often as possible we tried to go to the organization and explain how it works but still the promotion of PA was not enough in my opinion. What else we also did is to couple people from the alliance team with people outside (in the organization) for them to exchange knowledge and see how it works and inform them. This we have done with different sections within the ProRail and that's how we tried to get acceptance and support for it. – interviewee #12	2
Q169	PA is new for us. I think we tried our best as the alliance team to spread the knowledge within the organization by means of presentations, seminars and promotions but I don't think it is enough. Much more time and energy is needed for it. And the question is whether the alliance team has to do this or the ProRail itself? - interviewee #14	2
Q170	I sometimes compare our project with a duck swimming; above water everything seems so peaceful and smooth but under water there is a lot of activities going on. Thus we didn't have enough time to promote the concept of PA and were rather busy with the project itself. – interviewee #11	2
Q171	The alliance is very useful because you will take advantage of the knowledge of both the public and private parties. But for this you have to trust each other and together find the best solution. This was not the case for this project in the beginning. Lack of	2

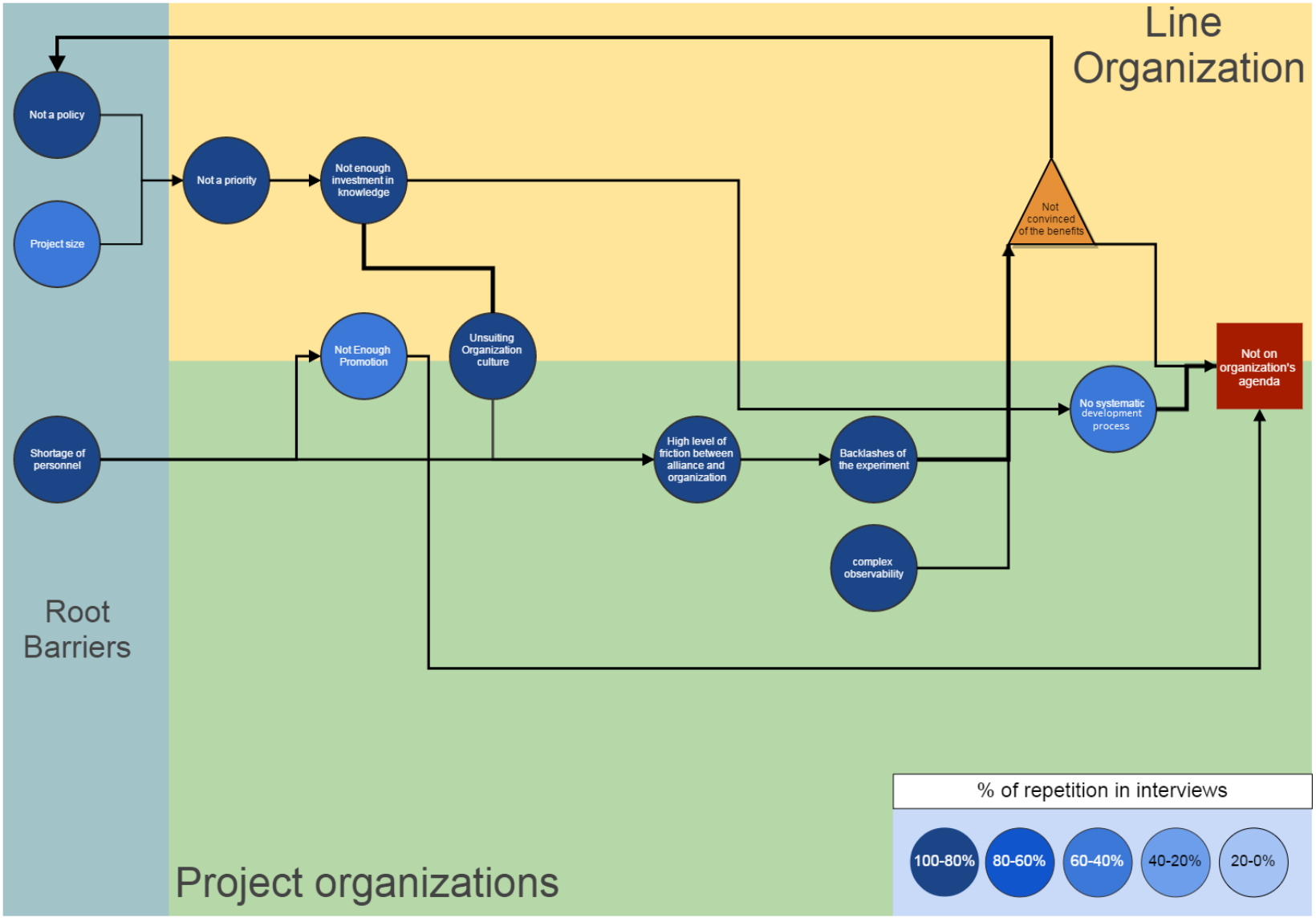
	trust was observed for both inside the alliance and with interactions with the organizations.- interviewee #9	
Q172	They partly see PA as a threat for their own function. And this is the difference between the people who are involved with new way of workings and those who are stuck with old behaviors. Unfortunately you can see this on both sides, client and the contractor. – interviewee #9	2
Q173	We were not working from the same location as other employees of PNH. And I think some jealousy and envy was formed that people thought since we are working in a separate location, we have our own rules. But in fact we have the same rules as they do, but since we are allocated to a project, we are more focused on progressing that. This jealousy could also be due to the fact that the personnel of the project were externally hired. – interviewee #10	2
Q174	When you have an alliance you work together and you have to trust each other. But it is difficult for people to let it loose. When you have the alliance you transfer your responsibilities to the alliance and you have to give them room to do their work. For many people this is difficult and they are not used to it. – interviewee #13	2
Q175	The control mentality and culture is due to the fact that alliances are rare and mother organizations are adapted to D&C contracts. There is this impression that we, as ProRailers within the alliance, are being considered as contractors from our own organization. – interviewee #12	2
Q176	The people in the organization said since you are going to work closely with the contractor, they are going to use all your budget and try to get all the mutual risk-pot money and you will end up with empty hands. Solely based on the normal distrust between client and contractors, a lot of people didn't expect to find the basis of trust to work together. – interviewee #11	2
Q177	In the past years we see a culture of management based on hard sides. Lots of attention on rules, arrangements, tasks and much less on the relationship, process and how you are going to interact and work. In other words we are used to the culture that we say, this is the contract and this is what you do and this is what I do and we each do what we should do in our own corner and focus on the hard sides. As a consequence our culture is quite inclined towards control, and the structure of PA is more inclined towards trust therefore it's a matter of control vs trust, meaning the base attitude is different. And if you have this culture for many years, people will get used to it and suddenly wanting to do it differently is difficult. Thus within ProRail there is a huge need for development of personnel if more PA's are to be implemented. - interviewee #17	2
Q178	You must have people that have the required mentality for PA, believe that they can cooperate with each other and actually radiate that. But if you don't believe that and approach it purely from the contract, then you might as well not have an alliance. There is always this risk in the background that if you don't do it right, maybe you are better off with D&C contracts. If there is no trust between the parties, then by all means don't start an alliance.- interviewee #16	2

Q179	It is a very traditional market and traditional organizations so it's difficult to change too fast. – interviewee #16	2
Q180	Shortage of public personnel also influences the culture of alliance teams; this way the dominant culture will be from the private side but you want to create a new mutual culture based on both organizations. – interviewee #16	2
Q181	The success of PA depends on the people. What RWS did very differently than ProRail, was that they put a lot of effort in the tender phase where they invited the contractors to see if there was a click and sessions focused on the soft skills between the parties to see if there was a chemistry between the parties. Interpersonal chemistry was a big part. And I think RWS did better in this regard. Because in the A2Hooggelegen, the alliance team itself was very stable from the beginning to the end. And that team also really made it its business to hammer in this combined culture; we are not from RWS, we are not from the contractor, we are alliance A2Hooggelegen. They had a sense of pride in their alliance and team. And focused on doing what is right. – interviewee #16	2
Q182	It could be that someone finds PA beneficial but is concerned with its accountability due to thinking that we don't have division of tasks or clear responsibilities and rules. That isn't true, you do have clear responsibilities and rules but they are different than what people are used to from conventional contracts. – interviewee #17	2

Appendix 8 – the diagram of barriers in ProRail



Appendix 9 – the diagram of barriers in the province of North-Holland



Appendix 10 – The validation interviews' quotes

This appendix includes interesting and informative quotes from the validation round interviews. The remarks of the interviewees are separated according to the barriers they are referring to.

External influences

There are two sources for the external influences on Rijkswaterstaat to mainly focus on DBFM contracts:

The finance and budget of the projects is easier to manage in DBFM contracts than other contracts such as project alliancing.

The government in general is more inclined towards DBFM since they see more benefit in this contract form therefore Rijkswaterstaat is also expected to use DBFM. Government wants to stay in a distance from the market, this helps with the policy of shrinking government. Consequently, DBFM projects are already planned for us in Rijkswaterstaat. For example the minister of infrastructure and environment provides us a list of DBFM projects to be implemented. Then we conduct the concerning studies in the exploratory phase of the projects by use of instruments such as the public private comparator to investigate whether these projects are really suitable for DBFM, which usually is the case. There are of course exceptions that due to the complex nature of the project or the high risk profile we return the task to the ministry with the suggested contract type. This has only happened twice till today.

In general, if the outcome of PPC is positive for DBFM, then it is a definite choice for us. However it should be said that the external influence is not the only reason we use DBFM contracts but the degree of DBFMs that we have is highly influenced by politics. – interviewee #18

In the past 25 years, the politicians have been pursuing a smaller government, where with the least possible number of personnel, the largest possible work packets are put in the market. And DBFM contracts have been considered as the most effective contract for such measures. Therefore it is the preferred contract type by the politicians and they influence Rijkswaterstaat to pursue more DBFMs. – interviewee #20

External influence on the contract choice used to be the case for Rijkswaterstaat but it is no longer an issue. Since around 2 years ago, the Brussel agreement for budget deficit dictates that the entire financial liquidity of DBFM projects, should be accounted for the same year as

the start of the project, therefore the argument that this agreement is inclining politics towards DBFM is no longer valid. – interviewee #22

I do believe there is an external tendency towards DBFM contracts but if you have a good argument to use another contract type, it would not be a problem. So you just have to convince people that DBFM is not suitable for a specific project. The politics do want DBFM due to the finance of the projects, but they also want efficient partnership and cooperation with the market, added value, step by step improvement, adaptive projects, flexible scope and etc. Thus with emphasize on these principles and interests, a good argumentation should be provided to choose other contract types such as PA. – interviewee #25

Lack of clear policy

The uniformity that we want is not about the contract type, but rather about the perquisites of the contracts, the work requests and etc. Therefore it is about the clarification of the rules and requests. – interviewee #18

Our policy is to put as many responsibilities to the market as possible, unless practically impossible. – interviewee #19

The development of appropriate policy in an organization is necessary and logical for the development of a new process such as project alliancing. This policy development was observed for DBFM contracts in Rijkswaterstaat as more and more projects were appointed to be realized via DBFM. But it is the reality that for project alliancing this policy is still missing, and without more projects, it seems unnecessary to develop such policy. – interviewee #20

The policy of Rijkswaterstaat used to be 'DBFM, unless…' as it was very strongly propagated by the former director general of Rijkswaterstaat, but the current director general is quite in favour of alliances and not DBFM contracts. Thus we do have a strong policy towards alliances but as a very conservative organization our pace of

change is very slow. DBFM in Rijkswaterstaat is only inhabited, as we are used to it, but it is not a policy to do it. – interviewee #22

It is true that PPC is very generous towards DBFM, thus we are trying to reassess the figures in PPC and to link them with our experiences out of the projects, as a result, attaining better assessment criteria for the deciding on the contract type. This being said, the method used will stay the same, but the figure criteria should be updated. However the challenging issue is that since DBFM contracts are awarded for a long period, it requires a long period of time to gather such experiences and use them. – interviewee # 23

My critic towards the policy of the organization is that we do not evaluate it thoroughly. We should evaluate our policy and form it according to our experiences and lessons learned. This way, project alliancing could also receive more attention. – interviewee #23

I acknowledge lack of clear policy towards PA as a barrier; if it is not a policy in our organization to have project alliances, we will not give it any attention or even consider it in our contract choices, and our instruments such as PPC will not include the option for it, thus the outcome cannot be project alliances. – interviewee #24

I think the reason that we have not made project alliances a policy in Rijkswaterstaat is the organizational changes that have kept us busy the past years, otherwise there is no concrete reason why it should not become a policy. Due to these organizational changes, it has been our main concern to implement our current policy as good as possible rather than to create new policies; this means to do what we already do better, than to try something new. As a result I do not believe in the short term we will suddenly have a policy for project alliances. – interviewee #24

We should see for which category of projects we need to use project alliancing, and monitor our process and policy accordingly. I believe there is a category of projects that can benefit from PA but are currently overlooked. – interviewee #25

Project alliances are a rare route for Rijkswaterstaat, so we don't have a policy for it. And if someone chooses to initiate a PA, many more issues will be raised since it is not a policy or in our reference framework. This causes for the decision of initiating a PA to be required to pass many steps, each one with their own complexity. If there is a good argumentation for it at the end, it can become a PA however this procedure takes so much time that at the end of it, it is too late to make it a project alliance, for example due to the deadline of the project. – interviewee #26

Unsuitable project sizes

I believe there is no up limit for the appropriate project size for project alliancing; furthermore project alliancing could be done for a section of the project rather than the whole project if necessary. In general, the size of the project does not play an important role in the decision of realizing it via PA, rather the complexity, risk profile and uncertainties should be considered as factors. – interviewee #21

There are lots of examples of large project alliances in the world, thus I don't see projects being too large as a valid argument for not realizing them via PA. Alliances are not limited on the amount of money on the upper side, however if a project is very small, then it would not be worth it to set up an alliance. – interviewee #22

I do not agree that unsuitable project sizes could be a barrier for project alliances in Rijkswaterstaat; firstly we have a wide variety of projects with very different sizes and scopes from very large to small, and secondly project alliances can be used to realize a part of the project and it does not have to be used for the entire project, as it was also the case in A2Hooggelegen. – interviewee #24

I believe the project size is not a factor in whether it can benefit from PA or not, it is only about the uncertainties, risk profile and complexity of the project. – interviewee #25

Shortage of personnel

Due to the governmental cutbacks, we are forced to choose for contract types that require the minimum amount of human resources to deliver

more projects, and I don't think PA is the right partnership model for this dilemma, since I believe it requires more personnel. – interviewee #19

I doubt that project alliancing requires more personnel than the conventional contracts; maybe the roles are different but if you consider the time and resources spent on the change orders, potential discussions and disputes in our current contracts, and use these resources in project alliancing on the project itself, then I believe you will not require additional personnel but rather more efficient use of personnel. – interviewee #21

I believe there is shortage on the quality of personnel and the quantity of personnel. We do not need more people, we need more experience. As a matter of fact I think we need less people, since with a problem of shortage we will get more creative. Now we have an overload of resources, so there is no need for change at all. Additionally, alliances need less people than DBFM contracts, since the project is cut into parts and double loads are eliminated. Therefore having less people can actually push us towards alliances. – interviewee #22

We don't have shortage of personnel on the quantitative aspect, but rather on the qualitative aspect. I think the shortage of personnel on quantitative aspect is merely a perceived barrier rather than a real barrier; it could be only an illusion or a resistance argument. – interviewee #23

It could be true that project alliances require more personnel, but this does not mean that we cannot do a number of project alliances in Rijkswaterstaat; I can imagine an argument stating that we cannot realize all or the majority of our projects via PA, but we can certainly realize a limited number of projects that could truly benefit from it due to their complexity. – interviewee #24

I do think if there was a shortage of personnel it could be a barrier but I think currently it is not a barrier rather it requires a different approach; We need to involve a third party in the alliance, in our projects, there are usually many other parties that have stakes in the project such as the

municipalities or other governmental bodies, thus they can also provide a number of personnel for the alliance team. – interviewee #25

Not being a priority

Since we as public parties are becoming smaller and still have lots of work, there is a huge priority for us to improve our partnership with the private parties to maintain our projects within the required quality, time and money constraints. However to say this priority is translated to project alliancing, that I cannot say. - Interviewee #18

I think for the road projects, PA is not a priority of Rijkswaterstaat at this moment, however for the water projects I believe is has become a priority. – interviewee #20

For PA to become a priority there should be a complex problem that we are unable to handle with our current methods but at this moment everything is going smoothly in the organization and there isn't any challenge that is causing us problems. Thus it can be asked why we need to change? Never change a winning team. – interviewee #22

Unforeseen next step of the experiment

It should be asked whether project alliancing is fairly evaluated in Rijkswaterstaat. It was an experiment, thus you want to learn something from it. Therefore I can imagine that before the experiment, motives, goals and visions were defined. And with appropriate evaluations, if the goals were achieved, then the next step towards the vision should be taken. – interviewee #19

I completely agree that this was a barrier for PA in Rijkswaterstaat; when an experiment is done, we have to monitor and evaluate it thoroughly and decide what the next step could be. The next step can also be that we don't do it anymore, but we haven't actually made it clear what we will do next with the experiences of this experiment. – interviewee #25

Not enough initiation/leadership from the directors

> ***In Rijkswaterstaat, as any other large organization, directors play an important role in starting a change; if a change is desired, it should be initiated from the higher levels. But I believe since it is not yet a policy of Rijkswaterstaat, it is not initiated by the directors. – interviewee #20***

> ***I think the lack of initiation is due to the fact that the directors are not willing to take the risk of doing something new. They are concerned with the end results of the projects, and if they try a new concept, they would be responsible for it on their own. Thus they are hesitant to take such risk. – interviewee #22***

> ***I think the reason that the directors do not take enough initiation for a project alliancing is the internal politics of the organization; it is difficult for people to carry out something that others are not on board with. – interviewee #23***

> ***If something is not a policy of an organization and it is not a priority, then it is logical that the directors will not initiate it. For example if you are a director and you are being expected to perform a variety of tasks but not anything about project alliances, it is logical that it will not receive any attention before everything else is done and due to their busy schedules they will not have any time to consider something that is not expected from them. Therefore I agree that this could be a barrier but it is due to other barriers. – interviewee #24***

> ***This is possibly a barrier but it should be investigated what has caused it; I believe the reason for it is that PA is very new and the concept is quite different than what the people are used to, thus they will not initiate it just because they don't know how to do it. – interviewee #25***

> ***Since it is currently not in our policy to do project alliances, the only way for it to be done is by the direct order of high level directors. This has to be done with a good argumentation, but if such initiation is lacking, we will not have any more project alliances. – interviewee #26***

Not enough promotion

> *I think there is a communication problem within the organization, as I have personally not heard enough of the progress of PA in Rijkswaterstaat despite the fact that in my field of activity I could highly benefit from the potential advantages mentioned for it. Therefore this information has not reached the organization in an effective manner. – interviewee #19*

> *I think the project organizations should promote the concept of PA, not the directors, as they are the consumers in this regard. This project organization should give alternatives to the directors, for example providing two scenarios of doing the project and let the directors see the chances and risks of each scenario with a thorough analysis. – interviewee #22*

> *I think you should have a number of people who are really enthusiastic about project alliances and they should show the benefits of it to others. This happened to some degree after A2Hooggelegen by the project team, however those people had to take on their next task thus they become busy with other stuff. Therefore the promotion was decreased. Another issue is that promotion could also be external; for example since ProRail has stated they want lots of more project alliances but they actually have managed to realize only three projects via PA, this also negatively influences the decision for PA in Rijkswaterstaat, as it will raise the question why haven't they had more project alliances? – interviewee #24*

> *Promotion is very important but to promote something you have to have a good story for it; what is the selling point of the concept? What are the benefits? To answer these questions you have to have good experiences and examples. Therefore promotion requires more examples. – interviewee #25*

Not enough investment in the knowledge of the organization

> *For more investment in the knowledge, project alliancing should have more priority in the agenda of the organization. This can be done by having clear mandates for it. – interviewee #20*

The lack of knowledge in the organization with regard to PA and its limited use, is similar to the dilemma of chicken or the egg; which should come first? We need more experiences to gain knowledge and we need knowledge to initiate more experiences. – interviewee #21

There should be investment in the practical knowledge of people with regard to project alliancing, however it should be noted that you don't have to know how something works in details to use it. For example, you might know how to ride a bike but do you need to know how it works to ride it? Thus we should not be inhibited for use of PA by not knowing the details of it. – interviewee #22

Not enough investment in knowledge is a barrier for adopting PA, however there is a consideration in this regard: if only a very limited portion of projects will be realized via PA (for example 1% or 2% of the projects) then investing in the knowledge of the whole organization about PA is not required, rather just a very limited number of people. This being said, if as an organization we are planning to have for example 6 project alliances in the future, we should now see if by that time we have trained enough people to put in those alliances or not. This is also the case for people not in the project teams, such as the people who decide which contract type to be used. – interviewee #25

Not suiting organizational culture

Unfortunately the culture is based on distrust for the private parties with the mentality that they are only looking to gain financial gains from the project and nothing else. This has caused us to adopt a control culture and has been the case for a long period of time. Additionally it cannot be denied that the financial gain is extremely important for the private parties and this might affect their behavior in the partnerships. – interviewee #21

The biggest disadvantage of project alliancing is that you have to change, and who is voluntarily willing to change? for example if I am used to work in a certain way, it would be difficult for me to change my way of doing things and in some cases maybe 'de-learning' what I already know. – interviewee #22

We build dikes that are supposed to stand for a long period of time. Therefore we are mentally formed for stability. Stability provides a sense of security and certainty but inhibits creativity. Thus in the field we are working, being risk-averse is a dominant mentality and culture. – interviewee #22

High level of friction between the alliance and the main organization

The people, who stayed in the main organization, kept working the same way but the people who were put in the alliance had to work quite differently. And when the people in the alliance came up with very different requests for their colleagues, it caused a degree of tension since they were not used to it. – interviewee #18

I believe a lack of friction is a barrier not the high level of friction. The more friction there is, the better something is formed. It could be a lack of strong people but not high level of friction. – interviewee #22

Backlashes of the experiment

Backlashes are common for experiments in this scale. We also had very bad first experiences with D&C contracts in the same period of the Betuweroute project, but you see that it is now being used extensively. Therefore I don't consider backlashes can cause barriers. – interviewee #18

Operational problems

Operational problem could be acting as barriers for adopting PA, for example we still haven't found the suitable mechanism in Rijkswaterstaat to share the risks with the private parties, without forming a legal entity, that enables us to keep the financial benefits that could achieve via cost saving. – interviewee #18

This is true that they pose some limitations, but it is not a reason not to do project alliances. If you want to do something, you always have to overcome some operational or practical problems, and project alliances are no exception. For example operational problems can be the case for every project that we have. Interviewee #24

Complex observability of the advantages

> ***Making the benefits of project alliancing observable can be a challenge, but this needs to be done. For example according to a report that I've read, one of the advantages is that everyone with experience in PA wants more of it, is that not enough advantage? Enjoying the work is crucial for increasing the efficiency; however such benefits should be made more comprehendible. – interviewee #23***

> ***The observability of the benefits on hard results is more complicated for project alliancing. For example, in A2Hooggelegen, it can be argued that the project cost more than conventional contracts, despite the successes achieved in the project that might not have been the case if another contract type was chosen. – interviewee #26***

No standard framework

> ***It is true that there are no standard frameworks for project alliancing in Rijkswaterstaat, and this can be seen as a barrier for its adoption, however it creates a dilemma: for frameworks to be developed in the organization, there should be a need for their use, so if no new projects are being appointed or selected to be realized via PA, there would be no need to develop standard frameworks for them. – interviewee #20***

> ***Project personnel usually are very inclined to deviate from the standards; therefore I do not believe this can be considered a barrier. People prefer to find their own way of working than to follow a standard procedure. – interviewee #21***

> ***Having no standard frameworks can be a barrier but it can also be a chance; when we have standards people try to deviate from it as much as they can, and when we don't have a standard they see it as a barrier. Therefore I think it depends on the project teams but I can imagine that the lack of standards could be a barrier for some project teams. – interviewee #23***

> ***Having standard frameworks is not necessary in the experimenting phase; rather the frameworks will be developed from the experiments. Thus saying we cannot experiment since we don't have standard***

frameworks is not acceptable. It is with the experiences from the experiments that such frameworks should be developed. – interviewee #25

Accountability concerns

I think the accountability concerns are being used as an argument for not doing more project alliancing, thus in this aspect it is a barrier but it is a barrier that can easily be solved. – interviewee #23

Not enough motivation/initiation from the project teams

There is a fear of failure for using anything new such as project alliancing. This is due to the fact that if a project alliance fails, it would be very complicated in juridical aspects, as it would be impossible to hold a party responsible for it. Therefore people in the organization especially from the procurement department have a negative attitude towards it, as it can be very risky in this regard. – interviewee #18

I believe saying that only the directors are not taking enough initiation is not fair, rather the whole organization is not taking enough initiation, including project teams and etc. for example if a project team says our project can be better realized via PA, I believe it will be accepted by the directors. But this is also not happening. – interviewee #21

If people like to do something they will find the argument for doing it. Therefore it is very important to first motivate people than expect them to initiate it. – interviewee #22

Lack of champions

We need people who would act as champions for PA but I believe champions are made in the alliance and not before it. – interviewee #18

I think it is not right to have champions for project alliancing without the appropriate project for it. The need for implementing PA should come from the projects firstly, and then if the need exists, then there should be champions who lead it towards the right path. However

unfortunately this is usually how it works in Rijkswaterstaat that someone has to stand up for a new concept to be used. – interviewee #21

It is true that there needs to be a champion for project alliancing for it to be promoted and realized in Rijkswaterstaat, however this champion should not be leading PA for only a specific project but rather for the whole concept of PA. Otherwise there would be a risk of having another PA such as A2Hooggelegen but no follow-ups for the concept. Thus the champion should also be concerned with making the policy of PA in Rijkswaterstaat. – interviewee #24

Recession

I do not think recession is a barrier for adoption of project alliancing; apparently we can now afford to pay for the extra works and have cost overruns in our projects. If due to economic situations we couldn't afford this and were looking to make the most out of the situation, having PA would actually be more logical. – interviewee #23

I can see that the public parties could be tempted to misuse the economic situation to get better prices for their projects, but this is not right, as it will destroy the market. I don't believe in Rijkswaterstaat this is the case. Furthermore, I believe private parties would actually prefer project alliances in hard economic situations as they will share the risks with the client, thus they are in reality more motivated to stay true to the principles of project alliancing. – interviewee #25

Bureaucracy

I don't think this is the case in Rijkswaterstaat, however about this barrier I can say that if the top directors really want it and put pressure and priority on having project alliances, it will eventually get through. This was also the case for DBFM contracts. – interviewee #24

Rahat, A. (2014). Organizational barriers for adopting project alliancing – an investigation in the Dutch public infrastructure procurement organizations. The Netherlands, Delft University of Technology