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Creating public value

Optimizing cooperation Between public and private Partners in infrastructure Projects

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CREATING PUBLIC VALUE

Optimizing cooperation between public and private partners in infrastructure projects

L.S.W. Koops

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SUMMARY

SUMMARY

Infrastructure projects - such as the construction of tunnels and bridges or the (re)construction of roads and highways – are always performed to add quality to society. In The Netherlands, these projects are most often financed by the government, from local to national level and constructed by private contractors. The performance of the projects' execution is far from optimal. Literature reports that projects worldwide are not delivered within time and budget. Civilians are confronted with delays and additional public funding for these projects. At the end of the 1990's and the beginning of the 21st century new collaborative arrangements were introduced by the government to increase value for money. The governmental role had to change into a more service oriented role towards society. To share responsibilities and risks in the project the private partner was involved earlier in the construction process. At the same time though, a national scandal in the Dutch construction industry - the 'construction fraud affair' - damaged the relationships between public and private project partners.

But sharing responsibilities and risks in the new contract forms increased the need to cooperate. Taking into account that the relationships take longer because they start in an earlier phase and in some occasions end after years of maintenance, constructive relationships between public and private parties become inevitable for both partners to be successful in delivering the projects they are responsible for. So, after almost 10 years of fragile relationships, dominated by distrust, partners, public and private partners are trying to establish a new culture of cooperation with respect to each other's interest.

Literature recognizes client, contractor and the interaction between them as dominant factors influencing *project success.* In addition, literature shows that *project success* can be indicated by more than delivering the project within time and budget. Project success can also include other contextual elements, for instance *perceived performance, commercial success* or *satisfies the needs of the client.* The client in an infrastructure project has many occurrences, like the various users, the operator, the owner or the responsible politician. Hence, the context in which infrastructure projects are performed is complex in several different ways. Considering this field of infrastructural projects with governmental ownership, the main research question was *How can the governmental project structure be organized to support the cooperation between public and private partners towards enhanced project performance?* The research concentrated on the management and organization of projects in the pre-construction and execution phase.

The research was conducted in four stages combining qualitative and quantitative studies with the focus on the organizational levels where people of public and private organizations daily collaborate.

The first part of this research is reported in Chapter 2 and 3. Chapter 2 describes the literature on project success, collaborative relationships and organizational differences between collaborating partners. Public and private organizations differ fundamentally. In the cooperation with the private partner in the infrastructure projects the public partner is supposed to behave as businesslike as possible, to accomplish the efficiency and effectiveness aimed for. But other values of the governmental culture, like accountability and legality, can conflict with these values, causing a different risk approached by both partners. To enhance effective team work, integrated collaboration mechanisms and an effective organizational project culture should be established. From literature it is known that the project manager has an important role in translating the collaborative concept from organizational level to team level and forming a project culture in which people can perform effective.

Chapter 3 shows from a practitioners view the challenges the cooperating partners have to deal with in their projects. Four multi-disciplinary projects in The Netherlands were analyzed, followed by exploratory interviews with four public project managers (not necessarily linked to these projects). The cases show that public and private organizations at strategic level embrace the new cooperation forms if strategic goals can be better met. The organization of the cooperation is left to the tactical level, and at this level the challenges are severe. Misfits between responsibilities and consequences cause tension between public and private partners. Unclear ownership causes delays in decision-making processes. Insufficient awareness of strategic coupling and organizational aspects ensure that the benefits of the cooperation are not met.

Subsequently the exploratory interviews with the public project managers gain more insight in the role of the public project manager. This person acts on the interface between project organization and permanent organization and manages both the interface with the private partner as well as the interface with the parent organization. At the first interface the public project managers approached conflicts as a negotiating challenge and they considered this manageable. At the interface with the parent organization they seek for consensus, which is considered much more difficult and time consuming.

So far researchers have been looking at the public partner in projects in a passive role with respect to project success. The aim of the second part of this research was to reveal what public project managers who are actively involved in the project, consider project success.

Using Q- methodology, different viewpoints on project success were found. Q-methodology combined both qualitative and quantitative methods. It is a systematic approach to the subjectivity of the subject 'project success'. A set of 19 success criteria, compounded from literature and trial interviews, has been submitted to 26 Dutch and 28 Western European public project managers (Chapter 4 and Chapter 5). They were asked to rank them relative to each other. From most representing project success to least representing project success. Based on the individual Q- sorts, general 'perspectives' were derived of managers that have the same vision on the ranking of project success criteria. Next to the Conventional project manager, who ranks the traditional *within time* and *within budget* important criteria for project success, three other perspectives were distinguished. The Product-driven manager favors *fit for purpose* and the Parent-oriented manager favors *specific political and social factors.* The Manager with a stakeholder focus ranks *satisfies the needs of stakeholders* and *satisfies the needs of shareholders* most important in judging project success. Awareness of these different perspectives will help the private partner to understand the motives of the public project manager.

In the third part of this research the relationships between public and private organizations were studied. Therefor a social network analysis was performed in three cases. The social network analysis was performed from an ego-centric approach, meaning that the network is mapped form a central point. The central point in this research was formed by the public and private project managers of the two cooperating organizations (Figure 1). In 26 interviews the nature of the relationships of the core team members in these cases were investigated, and their influence on the project. In Chapter 6 the cross-case analysis of these cases is reported. This analysis uncovered five mechanisms leading to tensions between project partners: ambiguity, conflict of interest, triangular relationships, unclear purpose and organizational context. In Chapter 7 the network of each case is presented in full detail. Each project analysis ends with a discussion on the influence of the connections in the project. This chapter shows that Social Network Analysis is a valuable approach for studying coordination mechanisms in inter- organizational project arrangements. The information channels within the project organization can be distinguished, as well as the links between project organization and parent organization. A substantive analysis of the reasons for the links shows that the project environment is in a sense 'manageable', especially when the approach is consciously considered and coherently applied by several individuals.

Figure 1 The interfaces of the combined project organization with their parent organizations
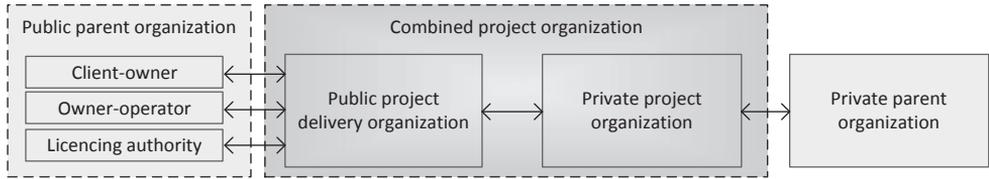
After analyzing cases, exploratory interviews, sorting out the essence of project management success for public project managers and researching the network in three cases, in the fourth part of this research the results are integrated (Chapter 8). In this part the public Value Chain with primary and support activities is developed (Figure 2), accompanied with nine recommendations for enhanced performance in public private project organizations. To validate the public Value Chain, it is presented to a panel of 21 experts, representing the viewpoints of the client-owner, the public project manager, the private project manager and the private parent organization. Based on their reflections, the recommendations were further developed. The final recommendations were presented to the experts after the meeting by means of an online survey.

Figure 2 The public Value Chain of the combined project organization
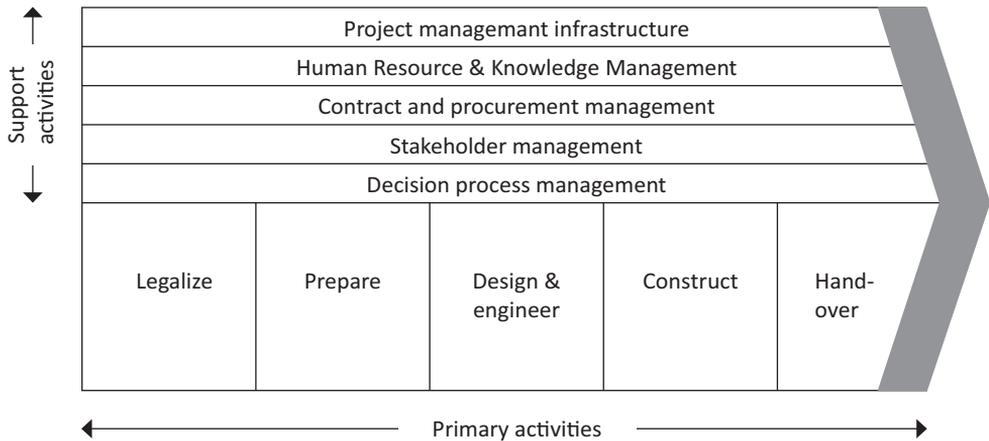
The public Value Chain is accompanied by nine recommendations for both project organization and parent organizations to enhance project performance:
1. After contracting, jointly organize the combined project organization for an efficient and effective production. Explicit attention should be given to the design of the Value Chain.
2. Pay conscious attention to Human Resource and Knowledge Management. Arrange a pro- active approach from the parent organization for designing development programs for employees and monitoring of required and acquired knowledge.

3. Be transparent about the public roles and organizational context of functions towards the private partner, in particular about the public roles licensing authority, owner-operator and client.
4. Act jointly towards external stakeholders. Validate the contractual design jointly to make sure the combined project organization is producing the right result.
5. Create the workflow towards asset-owners jointly, including decision-making by the accountable stakeholder.
6. Put the public project organization on a clear distance from the licensing authority, so the public project partner can actively contribute in procedures without conflicts of interest.
7. Make clear distinction between project management success and product success. Provide balance between management of the primary, creating activities and the support, controlling activities. Communicate and report separately but simultaneously on these activities towards the parent organizations.
8. Appoint a *Project pivot* for both partners, visible and approachable for the partner.
9. Organize on the level of the public parent organization a multiple project, multiannual agenda with the owners of public assets.

The public Value Chain will help collaborating partners to position their specific contribution more clearly. Specific recommendations for the public parent organization emphasize the subjects where common interest can be found at other levels than the project level. Finally, the public parent organization has to provide the project organization space to balance the interests of all stakeholders. In this balance the project organization truly serves the public interest.

Practitioners are encouraged to use the public Value Chain to organize their project activities and discuss the contribution of both public and private parent organizations to an efficient process. It can help the collaborating parties to define their role in the combined project organization and to distribute responsibilities more clearly. Because everyone's contribution leads to the controlled creation of good project results, trust can grow between partners, which will further optimize collaboration between public and private partners.

The public Value Chain for infrastructure projects is generally usable. The recommendations though are extracted from Dutch cases. Other researchers in this field are invited to expand this research abroad, and more specifically the Social Network Analysis. Furthermore, the scientific field is challenged to use this model in future research on losses within the Value Chain and strengths to support the Value Chain. With the dynamic environment in mind, it is interesting to perform research on the possibilities to enhance adaptively and creativity in the primary and support activities in the combined project organization.

L.S.W. Koops

SAMENVATTING

Infrastructuurprojecten - zoals de bouw van tunnels en bruggen of de reconstructie of aanleg van wegen en snelwegen - worden altijd uitgevoerd om kwaliteit toe te voegen aan de maatschappij. In Nederland worden deze projecten meestal gefinancierd door de overheid, van lokaal tot nationaal niveau, en uitgevoerd door private aannemers. De prestaties in de uitvoering van de projecten zijn verre van optimaal. Uit de literatuur blijkt dat projecten wereldwijd niet binnen de tijd en het budget worden opgeleverd. Burgers worden geconfronteerd met vertragingen en extra publieke financiering voor deze projecten. Aan het eind van de jaren negentig en het begin van de 21ste eeuw werden door de rijksoverheid nieuwe contractvormen geïntroduceerd met als doel meer waarde voor het geïnvesteerde geld te realiseren *(Value for Money)*. De rol van de overheid (ambtenaren) moest veranderen naar een meer *service georiënteerde* rol richting de samenleving. Tevens werd de private partij eerder in het bouwproces betrokken zodat de verantwoordelijkheden en de risico's in het project gedeeld konden worden. Maar in diezelfde periode beschadigde de relatie tussen de publieke en private partners door de perikelen rond de Bouwfraude.

Met de nieuwe contractvormen, waarin de verantwoordelijkheden en de risico's gedeeld worden, neemt de behoefte om samen te werken toe. Rekening houdend met het feit dat de relaties tussen publiek en privaat langer duren omdat ze in een eerdere fase beginnen en in sommige contractvormen uiteindelijk na jaren van onderhoud eindigen, zijn juist constructieve relaties tussen publieke en private partijen onvermijdelijk voor beide partners om succesvolle projecten op te leveren. Vanaf ongeveer 2010, na bijna 10 jaar van kwetsbare relaties, gedomineerd door wantrouwen, proberen publieke en private partners een nieuwe cultuur van samenwerking te bouwen, waarbij beide partijen oog hebben voor elkaars belang.

In de literatuur worden de klant, de aannemer en de interactie tussen hen herkent als dominante factoren die projectsucces beïnvloeden. Daarnaast blijkt uit literatuur dat *projectsucces* meer is dan het project opleveren binnen de afgesproken tijd, het budget en conform de kwaliteitseisen. Projectsucces kan ook worden gevat in andere contextuele elementen, zoals bijvoorbeeld *geleverde prestaties, commercieel succes* of *een tevreden klant.* De klant in een infrastructuurproject heeft veel verschijningsvormen, zoals de gebruiker, de exploitant, de eigenaar of de verantwoordelijke politicus. Het kader waarin infrastructuurprojecten worden uitgevoerd is vaak complex.

Gegeven deze context van infrastructurele projecten die in opdracht worden gegeven door de overheid is de belangrijkste onderzoeksvraag: ***hoe kan de publieke projectstructuur worden georganiseerd, zodat de samenwerking tussen publieke en private partners wordt geoptimaliseerd om de projectprestaties te verbeteren?***

Het onderzoek heeft zich geconcentreerd op het management en de organisatie van projecten in de projectfasen tijdens de voorbereiding (verkenningen en ontwerp) en tijdens de uitvoering. Het onderzoek werd uitgevoerd in vier fasen waarbinnen kwalitatieve en kwantitatieve studies zijn gecombineerd met een focus op de niveaus binnen de projectorganisatie waar mensen van publieke en private organisaties dagelijks samenwerken.

In hoofdstuk 2 en 3 wordt het eerste deel van het onderzoek gerapporteerd. Hoofdstuk 2 beschrijft de literatuur op het gebied van projectsucces, samenwerkingsrelaties en organisatorische verschillen tussen de samenwerkende partners. Publieke en private organisaties verschillen fundamenteel. In de samenwerking met de private partij in de infrastructuurprojecten wordt de publieke partij verondersteld zich zo zakelijk mogelijk te gedragen, gericht op efficiëntie en effectiviteit. Maar andere waarden van de overheidscultuur, zoals verantwoording en wettigheid, kunnen hiermee in strijd zijn. De publieke en private partners benaderen risico's anders. Om effectief de samenwerking te verbeteren, moeten geïntegreerde organisatorische mechanismen, een effectieve organisatie en een effectieve projectcultuur worden gecreëerd. Uit de literatuur is bekend dat de projectmanager een belangrijke rol heeft in het vertalen van de samenwerking vanuit de moederorganisatie naar teamniveau en in het vormen van een projectcultuur waarin mensen effectief kunnen werken.

Hoofdstuk 3 geeft vanuit de praktijk een blik op de uitdagingen die de samenwerkende partners hebben in hun projecten. Vier multi-disciplinaire projecten in Nederland zijn geanalyseerd, gevolgd door verkennende interviews met vier publieke projectmanagers (niet noodzakelijkerwijs gekoppeld aan deze projecten). Uit de analyse van de projecten blijkt dat publieke en private organisaties op strategisch niveau nieuwe vormen van samenwerking omarmen als strategische doelstellingen daarmee kunnen worden behaald. Het organiseren van de samenwerking wordt overgelaten aan het tactische niveau. Juist op dat niveau zijn de uitdagingen groot. Verantwoordelijkheden en gevolgen sluiten niet op elkaar aan, wat leidt tot spanningen tussen publieke en private partners. Onduidelijkheid over eigenaarschap veroorzaakt vertragingen in besluitvormingsprocessen. Onvoldoende bewustzijn van de strategische koppeling met organisatorische aspecten zorgt ervoor dat de voordelen van de samenwerking niet worden gerealiseerd.

De verkennende interviews met de publieke projectmanagers gaven meer inzicht in de rol van de publieke projectmanager. Deze persoon werkt op het raakvlak tussen de projectorganisatie en de moederorganisatie en opereert op zowel het raakvlak met de private partij als het raakvlak met de moederorganisatie (Figuur 1). Op het eerste raakvlak benaderen de publieke projectmanagers conflicten als een onderhandelingsopgave en ze ervaren dit als beheersbaar. Op het raakvlak met de moederorganisatie zoeken de publieke projectmanagers naar consensus. Dit raakvlak wordt beschouwd als veel moeilijker en tijdrovend.

Figuur 1 Het raakvlak van de gecombineerde projectorganisatie met de moederorganisaties
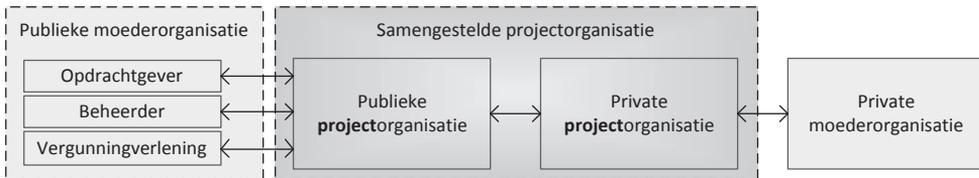
Tot nu toe hebben onderzoekers gekeken naar de publieke partner in projecten in een passieve rol met betrekking tot projectsucces. Het doel van het tweede deel van dit onderzoek was om te analyseren hoe publieke projectmanagers, die actief betrokken zijn bij het project, het succes van hun project definiëren. Met behulp van Q-methodologie zijn verschillende manieren voor het definiëren van project succes gevonden. De Q-methodologie combineert zowel kwalitatieve als kwantitatieve methoden. Het is een systematische benadering van de subjectiviteit van het onderwerp 'projectsucces'. Een set van 19 succescriteria, samengesteld uit de literatuur en test- interviews, is voorgelegd aan 26 Nederlandse en 28 West-Europese publieke projectmanagers (hoofdstuk 4 en 5). Daarbij is gevraagd de succescriteria ten opzichte van elkaar te rangschikken, van de meest naar de minst relevante voor projectsucces. Op basis van de individuele Q-sorts, zijn algemene 'perspectieven' afgeleid van managers die dezelfde visie hebben op de rangorde van de criteria. Naast de Conventionele Manager, die de traditionele criteria *binnen tijd* en *binnen budget* belangrijke criteria voor projectsucces vindt, zijn drie andere perspectieven onderscheiden. De Product-gedreven Manager kiest voor *geschikt voor het doel (fit for purpose)* als belangrijkste criterium en de Moederorganisatie georiënteerde manager kiest voor *specifieke politieke en maatschappelijke doelstellingen.* De Manager met een stakeholder focus kiest voor *voldoen aan de behoeften van belanghebbenden en voldoen aan de behoeften van aandeelhouders* als belangrijkste criteria voor het beoordelen van het succes van zijn project. Als de private partij zich bewust is van deze verschillende perspectieven, zal het hem helpen de motieven van de publieke projectmanager te begrijpen.

In het derde deel van dit onderzoek (hoofdstuk 6 en 7) wordt de relatie tussen de publieke en private organisaties en externe actoren bestudeerd. Daarvoor is een netwerkanalyse (Social Network Analysis) uitgevoerd voor drie cases (op nationaal, regionaal en lokaal niveau). Deze analyse is uitgevoerd vanuit een ego-centrische aanpak, wat inhoudt dat het netwerk is gevormd vanuit een centraal punt. Het centrale punt in dit onderzoek wordt gevormd door de publieke en de private projectmanager van de samenwerkende organisaties. In 26 interviews is de aard van de relaties van de kernteamleden en hun invloed op het project onderzocht. In hoofdstuk 6 is de cross-case analyse van deze drie cases beschreven. Deze analyse identificeert vijf mechanismen die leiden tot spanningen tussen de projectpartners: ambiguïteit,

belangenverstrengeling, driehoeksrelaties, onduidelijk doel en onduidelijke organisatorische context. In hoofdstuk 7 wordt het netwerk van elke casus in detail gepresenteerd. De analyse van elke casus eindigt met een discussie over de invloed van de relaties met externen op het projectresultaat. Er wordt aangetoond dat sociale netwerkanalyse een waardevolle aanpak is voor het bestuderen van de coördinatiemechanismen in projecten waarin meerdere organisaties betrokken zijn. De informatiekanalen binnen de projectorganisatie kunnen worden onderscheiden, evenals de banden tussen de projectorganisaties en omliggende actoren. Een inhoudelijke analyse van de redenen voor de relaties laat zien dat de projectomgeving in zekere zin te 'managen' is, zeker wanneer de omgeving bewust en op coherente wijze wordt benaderd door meerdere personen uit de projectorganisatie

Na het analyseren van de projecten, de verkennende interviews, het achterhalen van de essentie van projectsucces voor publieke projectmanagers en het onderzoeken van het projectnetwerk in drie cases zijn in het vierde deel van dit onderzoek de resultaten geïntegreerd (hoofdstuk 8). In dit deel is de publieke waardeketen (public Value Chain) met primaire en ondersteunende activiteiten ontwikkeld, vergezeld van negen aanbevelingen. Om het model van de publieke waardeketen te valideren zijn de uitkomsten gepresenteerd aan een panel van 21 experts. Het panel bestond uit vertegenwoordigers van de publieke moederorganisatie, de publieke projectorganisatie, de private projectorganisatie en het private moederbedrijf. Op basis van hun reflecties zijn de aanbevelingen verder ontwikkeld. De definitieve aanbevelingen zijn vervolgens voorgelegd aan de experts door middel van een online enquête en worden door hen in meerderheid onderschreven.

Figuur 2 De publieke waardeketen van de gecombineerde projectorganisatie
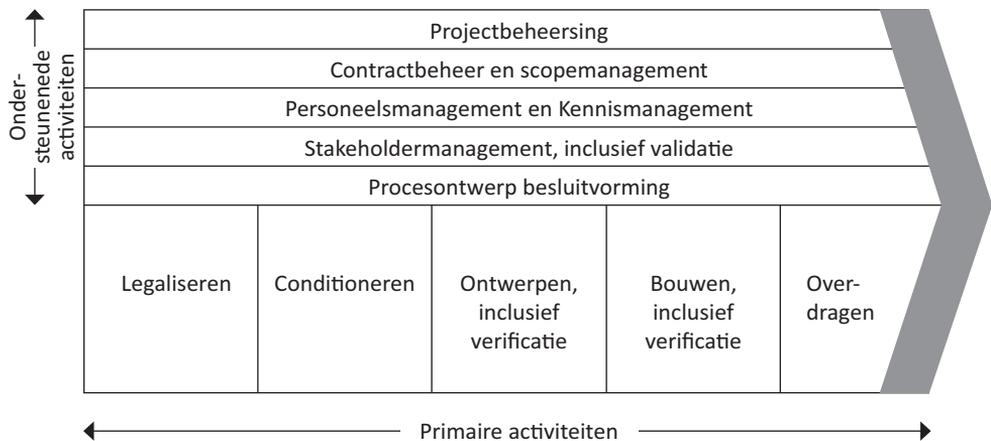
De publieke waardeketen wordt vergezeld door negen aanbevelingen voor zowel de projector-ganisatie als de moederorganisatie ter verbetering van de projectprestaties:

1. Richt, na contracteren, gezamenlijk de samengestelde projectorganisatie in voor een efficiënte en effectieve productie. Besteed hierbij expliciet aandacht aan het inrichten van de waardeketen.
2. Besteed bewust aandacht aan personeelsmanagement en kennismanagement. Zoek op het gebied van personeelsmanagement vanuit de moederorganisatie proactief aansluiting bij de projectorganisatie voor het vormgeven van ontwikkeltrajecten van medewerkers en monitor de kennisontwikkeling in het project en de kennisbehoefte van het project.
3. Wees transparant over de eigen rol in de publieke context richting de private partner. Maak daarbij expliciet onderscheid in de rollen die er vanuit de moederorganisatie (en partner) organisatie(s) zijn, met name in de rol van de moederorganisatie als vergunningverlener, de rol van de moederorganisatie als asset-eigenaar (beheerder) en de rol van de moederorganisatie als opdrachtgever.
4. Acteer vanaf start van de samengestelde projectorganisatie gezamenlijk in de projectomgeving. Valideer bij aanvang van het productieproces gezamenlijk het (aanbiedings)ontwerp.
5. Breng per asset gezamenlijk de workflow om te komen tot besluitvorming door de asset-owner in beeld. Deel kennis en informatie om maatgevende besluiten te onderbouwen.
6. Zet de publieke projectorganisatie op duidelijke afstand van de vergunningverlenende rol om belangenverstrengeling te voorkomen. Zorg zo dat de publieke projectorganisatie haar netwerk en kennis actief kan inzetten in procedures.
7. Maak expliciet onderscheid tussen projectmanagementsucces en productsucces. Communiceer en rapporteer separaat, maar gelijktijdig en in gelijke mate over technisch inhoudelijke voorgang en risico's en procesmatige voortgang en risico's. Zorg voor balans tussen creëren en controleren.
8. Wijs voor beide partners een vertegenwoordiger van het project in de moederorganisatie aan *('spil')*. Ook de partner moet deze vertegenwoordiger kunnen benaderen.
9. Organiseer op het niveau van de publieke moederorganisatie een meerjarenagenda met de eigenaren van andere objecten in de openbare ruimte om meerdere projecten op elkaar af te kunnen stemmen.

De publieke waardeketen helpt de partners om specifieke afspraken te maken over hun bijdrage aan het project. Specifieke aanbevelingen voor de publieke moederorganisatie benadrukken de onderwerpen waar gemeenschappelijk belang kan worden gevonden op andere niveaus dan het niveau van de projecten. Ten slotte moet de publieke moederorganisatie aan de projectorganisatie ruimte geven om te kunnen schakelen tussen de belangen van alle stakeholders. In het vinden van een evenwicht hierin dient de projectorganisatie echt het algemeen belang.

Projectmanagers worden uitgedaagd om voor het verdelen van de taken in het project de publieke waardeketen te gebruiken. Daarbij hoort ook het bespreken van de bijdrage van de moederorganisatie aan een efficiënt proces. De publieke waardeketen kan de samenwerkende partijen helpen hun specifieke rol in de gecombineerde projectorganisatie te definiëren en verantwoordelijkheden duidelijker te verdelen. Wanneer ieders specifieke bijdrage leidt tot goede project resultaten, kan vertrouwen tussen partners groeien. Dit zal de samenwerking tussen publieke en private partners verder verbeteren.

De publieke waardeketen voor infrastructuurprojecten is over generiek bruikbaar. De aanbevelingen zijn afgeleid uit Nederlandse projecten en daardoor toegesneden op de Nederlandse context. Onderzoekers worden van harte uitgenodigd om dit onderzoek in andere landen uit te voeren zodat de publieke waardeketen ook op de context kan worden toegesneden. De netwerkanalyse is daarvoor de juiste onderzoeksmethodiek. Bovendien wordt het wetenschappelijke veld uitgedaagd om het model van de waardeketen centraal te zetten in toekomstig onderzoek naar activiteiten in de waardeketen, zowel als het gaat om faalkosten en inefficiëntie als wanneer gezocht wordt naar succesvolle werkwijzen.

Met de vele ontwikkelingen in de maatschappij in gedachten, is het interessant om te onderzoeken hoe het aanpassingsvermogen en creativiteit in de primaire en ondersteunende activiteiten in de samengestelde projectorganisatie kunnen worden gefaciliteerd en vergroot.

L.S.W. Koops

Chapter 1 Introduction

Abstract

The purpose of infrastructure projects is to add quality to society. These projects have a diverse scope, involving several technical disciplines and multiple parties. In The Netherlands, these projects are most often financed by the government, from local to national level. Well known recent examples are the Maeslantkering (1997), the Betuweroute (2005) and the North-Southline (still under construction). Not all projects are this large but still, projects with smaller budgets are integrating several technical knowledge fields and have to deal with a number of governmental departments. The performance of the projects' execution is far from optimal, amongst others according to Flyvbjerg (2003): most of the projects are not delivered within time and budget. Driven by this knowledge and social developments, new contract forms between public organizations and private contractors are being introduced to increase the value for money (see for instance Eversdijk and Korsten, 2015; Hayford, 2006; Van Ham and Koppenjan, 2002). These new contracts shift responsibilities and risks in earlier project stages from public to private parties (backwards integration).

Public Value describes the value an organization contributes to society and is supposed to provide public managers with knowledge of how their activities can contribute to the common good (Moore, 1995). Project managers and engineers and managers of infrastructure projects are working hard to get good results, but information comes from many different sides and is not always timely available to the decision makers (Van Marrewijk et al., 2008). The new working arrangements that come with the new cooperation forms need to be better configured in order to increase the project performance and deliver better value for money in construction projects. This research is a contribution to enhancing project performance.

1.1 The performance of infrastructure projects

The term *infrastructure* refers to facilities needed for a country, city or area to function. These facilities are provided by physical objects such as roads, bridges, railroads, tunnels, water supply, and so forth. Infrastructure projects involve interventions needed to improve accessibility or safety of the physical objects. Local, regional and national governments are responsible for infrastructure projects, involving both the development of new infrastructure as well as the renewal of existing infrastructure. The government spends a significant part of their budget on infrastructure projects. From 2000 to 2014 the Dutch national government spend almost 50 billion Euro in the construction of new infrastructure (main roads, water systems and waterways), a yearly average of 3.55 billion Euro (CBS, 2016).

Research on project performance reports that the majority of projects fail to meet time and budget targets (Merrow, 2011; Shenhar and Dvir, 2007). According to Flyvbjerg et al.(2003) cost escalation happens worldwide in almost nine out of ten infrastructure projects. For a randomly selected project, the likelihood of actual costs after completion being larger than forecasted costs at decision to build is 86% (Flyvbjerg et al., 2003). The problem of project failure, budget overrun and/or time delay, is known for many years and subject of research for several decades (Koppenjan et al., 2011; Morris and Hough, 1987). Researchers provide different explanations for the budget overrun or time delay: technical, economical, managerial, psychological or political (Cantarelli, 2011; Lindahl and Rehn, 2007; Sauser et al., 2009). According to Flyvbjerg et al. (2003) benefits are often overestimated and costs/investments underestimated to obtain (political) support for the project. In 2011 Cantarelli reports an average of almost 20% budget overrun on infrastructure projects in The Netherlands. Table 1-1 shows the budget overruns of transport infrastructure in The Netherlands, North-West Europe and worldwide.

Table 1-1 Budget overruns transport infrastructure projects (Cantarelli, 2011)

	The Netherlands	North-West Europe	Worldwide
Railway	11%	27%	44%
Highway	19%	21%	18%
Bridges and tunnels	22%	35%	36%

Dutch infrastructure projects are mainly financed by the government, and thus by Dutch tax money. Though Dutch projects perform no worse than pproject executed in North-West Europe and Worldwide, the political pressure to improve the performance was, and still is, severe. The political client and Dutch tax payers long for a predictable outcome of the processes. In terms of money this means ideally no budget over- or under run. However, one can doubt if the social discussion should be narrowed to the budget overrun. Flyvbjerg et al. (2003) and

Cantarelli (2011) compared the budget set in the early phase with the final costs. The budget set in the early stage is used to make political choices between potential projects. In the subsequent phases the project team tries to add as much value as possible within the set budget. In these phases stakeholders, who can also be other governmental organizations or departments, influence the project. The stakeholders can even add scope and budget to the project. The question whether the invested budget is the same as the initial budget seems to be the wrong question. A more relevant question would be whether the invested budget represents the added public value. The budget overruns as Flyvbjerg and Cantarelli mention do not necessarily represent project failure, the presented figures (Table 1-1) do not give insight in the added value for the invested money. Extra benefits may have justified the additional investment(s).

For the execution of infrastructure projects the government cooperates with business partners like contractors and consultants (Arditi and Gunaydin, 1997; Cox et al., 2006). In the process from first initiative to final hand-over different cooperative relationships occur (Figure 1-1). These relationships are different in multiple aspects, in the phases in which the partner is involved, in allocation of risks, in organizational distance between people. The common aspect in these relationships is the reason for the cooperation. The government always strives for the most efficient way to achieve the project goals. Traditionally the public sector purchased an asset from private sector contractors and consultants whose liability was limited to the design and construction of the asset. Financial and operational risks remained with the public sector. To deal with budget problems, new contract forms to share or transfer risks were introduced in the 1990's. In these new contract forms the government offered more and earlier market orientation the public sector. By transferring risks to the private sector optimal value for money was expected (Hayford, 2006). This was expected to lead to greater cost-efficiency for governments.

Figure 1-1 Representation of involved parties in the construction process (Cox and Ireland, 2006)
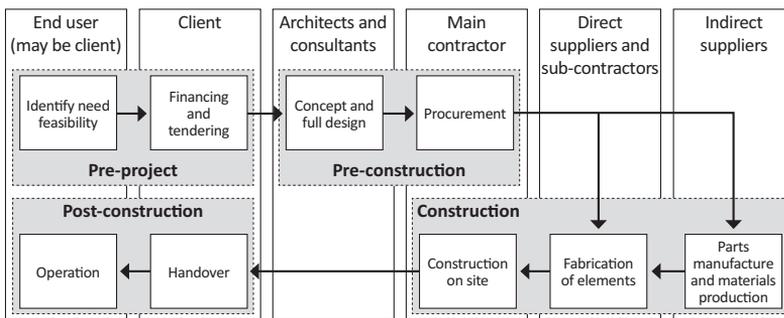
Where the relationship between public owner and private contractors had previously been characterized by joint realization in a later stage of the project, the new contract forms are about making plans together and take risks together (Kort, 2005). Unfortunately risk transfer is often handled poorly in public private partnerships (Ng and Loosemore, 2007). Sometimes risks are *"allocated to the party least able to refuse them rather than to the party best able to manage them, especially when the government maintains maximum competitive tension"* (p.591, Jin and Zhang, 2011). So cost overruns and delays still exist in infrastructure projects performed via public private partnership relations. Grimsey and Lewis, however, found much less cost overruns and delays in 110 PPP projects in the UK, compared to traditional contracts. The total project costs seem at least 10% less than in traditional contracts (Grimsey and Lewis, 2005). Hence public private partnership arrangements do have a positive effect on the financial project results of infrastructure projects, but still there is significant room for improvement, both in meeting the initial budget as in framing the performance in terms of value for money.

1.2 Public private cooperation at the beginning of the 21st century

In the period from the end of the 1990's and the beginning of the 21st century two important developments contributed to difficult situations in public private relationships in The Netherlands. As mentioned in Section 1.1 new contract forms to share or transfer risks were introduced to deal with the poor project performance. Due to the economic climate in those years the government had to increase the efficiency of their infrastructure projects further (Rijkswaterstaat, 2004, 2011). The Dutch national agency responsible for national infrastructure was reorganized, adopted the ideology of the American New Public Management and promoted both privatization and Public Private Partnerships (Eversdijk and Korsten, 2015; Metze, 2010). For a lot of public servants this strategic push of project activities to the market also brought job uncertainty.

In 2001, it was revealed that over the last decade contractors (over 300 companies) had been making illegal agreements on procurement procedures (Enquetecommissie, 2002). In 2002 a national parliamentary survey was conducted, generating lots of negative publicity for the construction industry. In 2005 the government and the construction industry agreed a compensation of 70 million euros. This national scandal (the *construction fraud affair*) affected the whole sector, including regional and local governmental organizations. The scandal and the strategic push to the market both damaged relationships in this industry, or worse, maintaining good relationships was discredited in the first years after the affair.

Years of fragile relationships between public and private partners, dominated by distrust, followed. But sharing responsibilities and risks in the new contract forms increased the need to cooperate. Taking into account that the relationships take longer because they start in an earlier phase and in some occasions end after years of maintenance, constructive relationships between public and private parties become inevitable for both partners to be successful in delivering the projects they are responsible for.

In 2011 the main players in the industry tried to change the situation by explicitly signing a joint statement in which they agreed to 'more cooperation' and 'respect of each other's interest' (Rijkswaterstaat, 2010). This statement with the intention to optimize results in these new contract forms was signed by the national agency and main contractors. Since the national agency is the biggest client for the contractors, one may argue that each contractor just signed this statement to stay in the competition for work. By 2015, cooperation between government and the market in projects was still the subject of discussion. Government, contractors and consultants agreed that relationships had to improve for enhanced performance in projects. Therefore, three major national agencies responsible for infrastructure (buildings, dikes and water-, rail- and highways) together with associates of contractors and consultants formulated a new intention statement (the *market vision*), which was signed by these parties in January 2016 (Rijkswaterstaat, 2016; Schultz van Haegen, 2016). The involved organizations have appointed ambassadors for active help in implementing the intentions in daily practice.

So anno 2017 all participants in the Dutch construction industry agree that optimizing cooperation between public and private partners is still an up-to-date topic. Economic climate has changed and the intentions to collaborate are expressed explicitly by all partners in the construction industry. A next step has to be taken to stimulate interaction and improve cooperation in infrastructure projects, in order to further enhance project performance.

1.3 The role of the public project manager

In this context another social development that started in the 1990's has to be addressed. Citizens had become more assertive and desired more public participation in design decisions and more response from the government to their questions and ideas (Leroy, 1997). Besides becoming more efficient, the government had to change into a more client and service oriented organization (Rijkswaterstaat, 2004). The reorganization of the Dutch national agency responsible for national infrastructure was not only to lower the organizational costs but also to stimulate a change of organizational culture within the agency (Metze, 2010; Rijkswaterstaat, 2004, 2008). This change was necessary because of the changed social environment over

the previous years. The change in organizational positioning in society changed the role of the public project manager of infrastructure projects. Traditionally the public project manager was a manager whose main concern was the technical correct execution of the plan. Technical knowledge was indispensable. Nowadays the public project manager has to communicate with the environment of the project (people, entrepreneurs) and project partners from other departments or governmental organizations. The public project organization has an increased role in the management of the project, performing risk management, scope management, et cetera (Hertogh, 2013). In the signed statement *(market-vision)* as mentioned in Section 1.2 the most important concern of the public project manager was expressed as 'to complete the project within the scope and actively interact with the project environment (users, local residents and politicians)'. This change in role also means that skills other than technical knowledge are becoming important for the public project manager.

The increased stakeholder involvement (civilians, entrepreneurs) also initiated a change of the scope of infrastructure projects. The scope evolved from mono to multi-functional to meet stakeholders expectations. Therefore, governmental organizations started to work with centralized, task oriented 'project management departments'. These special departments are no part of the traditional, knowledge field or discipline oriented organizational structure. The public project manager, who is from an organizational perspective located in this project management department, must involve other departments responsible for the traditional disciplines. In the public organization, not only the project organization is acting in a new role, but also the many colleagues. In the new role the influence of the traditional departments is not necessarily smaller than before, but the manner and momentum to express wishes and demands is different. At the start of a project the public project organization has to collect the requirements for the infrastructure assets. And in later phases of the project, documents prepared by the project team have to be approved by the departments responsible for the assets.

The increasing integration of functions in a project has increased the number of policy departments involved. Moreover, the increased service role of the public project organization towards external stakeholders (individual civilians, entrepreneurs) and the changed position towards the contractor changed the internal position of the project organization in the governmental organization.

Thus, the role of the public partner in the process of an infrastructure project has changed dramatically over the past decades. The private partner has taken over a large part of the traditional tasks. The responsibilities and tasks of the public partner towards external stakeholders are new and sometimes unknown. The scope of the projects has enlarged with multiple assets, integrating multiple functions in the project. And finally, the position of the public project

organization in their own organization has changed. In this context, the public project partner is expected to improve the performance of the infrastructure projects.

1.4 Research objective, research questions and scope

The development of new forms of cooperation is an important and inevitable development for government and businesses involved in this industry. Several new contract forms and procurement methods have been introduced in the last decades, causing changes in roles and responsibilities in public and private organizations. The changes in roles and responsibilities are noticeable in the whole governmental organization. The desired effect of the changes was (among other things) more efficiency in the implementation of projects. Both hard numbers (Cantarelli, 2011) and the letter of intent for improved cooperation (2016) show that the changes have not yet brought about the desired effect. Public private partnerships meet managerial, technical and financial problems in practice. These problems stem partially from the increased complexity of projects and the related demand for skills amongst participants (Akintoye and Beck, 2009; Van Ham and Koppenjan, 2002).

This research explores the mechanisms influencing the cooperative relationships between public and private partners. The focus is on the elements that disturb the cooperation and thereby decrease the efficiency and effectiveness. The goal is to increase the probability of project success at the beginning of private involvement in public projects; when new contract forms influence the starting point of the cooperation and the playing field of both partners. The research concentrates on the interface(s) between the governmental and commercial organization and focuses on the essential elements to optimize cooperation for better project performance.

The research focuses on the pre-construction and construction phase (Figure 1-1). The pre- project phase and political decisions on the selection of projects are not included in this research. The scope of the research is limited to projects in the infrastructure sector, further narrowed to projects initiated by governments (local, regional and national). The scope of the projects involved is restricted to projects with construction or renovation activities. The research concentrates on the management and organization of projects. The main interest is in the levels where people of both public and private organization daily 'execute' cooperation as set by the contract.

This research focuses on the organizational elements that influence the relationship between public and private partners cooperating in an infrastructural project. Given the research field of

infrastructure developments with governmental ownership, the main research question is:

How can the governmental project structure be organized to support the cooperation between public and private partners towards enhanced project performance?

In order to answer the main question the following sub-questions are formulated:
I.   What organizational difficulties do public project managers face?
II. What is project success for the public project manager?
III. How does the governmental organization influence the collaborative relationship with the project partner?
IV. To what extent can these insights be used to improve the efficiency of the public and private actions?

This research contributes to the improvement of collaborative relationships between public and private partners. Once the partners agreed to collaborate, cooperation must be further developed by the people who actually work on the project. Especially by the people who work at the interface of the two organizations. Teamwork-quality, both in the public as well as in the private project team, and between teams is essential for project performance (Suprapto, 2016). A new public private partnership is seldom staffed by people who already worked with each other in a previous project (Black et al., 2000; Dubois and Gadde, 2002) and collaboration has become more complex over the years as it involves multiple organizations, multiple agenda's, among others (Mankin et al., 2004). Creating a team is one thing, making it perform effectively is the challenge. Considerable difficulties are reported in spreading the collaborative concept throughout the organization and in translating the agreement reached into practice (Bresnen and Marshall, 2000). Achieving and sustaining cooperation is one of the challenges in the construction sector (Anvuur et al., 2012).

The results of this PhD research can be used to increase the contribution of each participating organization to an efficient process. The collaborating teams can be better equipped and instructed for their specific contribution to the project. The insights in the specifics of the contribution of their partner will help the project teams to align the processes between the teams. By doing so, their interaction can be more efficient and more effective. The research is designed to identify the functional elements that are important for improving the collaboration. The results are particularly important for those who set up and manage a project organization.

1.5 Research approach and methods

1.5.1 Research philosophy

To understand research well, it is necessary to be transparent about the research approach. For this research the pragmatic approach is followed. The pragmatic approach stresses that the most important determinant of the research method used is the research question, meaning that the research approach can be different for answering specific sub-questions (Creswell, 2013; Saunders et al., 2011). Taskhakkori and Teddlie (1998) argue that pragmatism is intuitively attractive, mainly because the researcher thus avoids to keep fairly pointless debates in their eyes about concepts like "truth" and "reality" as is the case with other approaches (Tashakkori and Teddlie, 1998). In order to answer the main question, the sub-questions are answered in four major parts of this research. Each sub-question is following a particular approach. To answer sub-question I the current situation is analyzed following a critical realistic approach. A critical realistic approach stresses the importance of research on multiple levels as the level influenced the reality, so at the individual, group and organizational levels. For this part the realistic approach is suitable as these different levels can be found in the organization of projects (see for instance(Alderman and Ivory, 2007; Dille and Söderlund, 2011; Suprapto, 2016).

The second sub-question focusses on the goals of the project manager, using a social constructivist approach with positivist aspects. The constructivist approach assumes that individuals seek understanding of the world in which they live and work (Creswell, 2013). Research with the social constructivist approach relies as much as possible on the participants views of the situation being studied. The positivist approach is based on research as factual as possible, without interpretation of the investigator. It assumes that there is one reality that can be described by an objective observer (Bosch-Rekveldt, 2011). The positivist approach is useful as people in this industry might adopt the findings more easily if they are based on facts. Hence, the research method to answer this sub-questions (Q-methodology) combines both approaches: the Q-sorts capture the individual viewpoints as factual as possible.

The third sub-question is answered also via a social constructivist approach with positivist aspects. The focus in this part is on factors influencing the project team. Again, the approach is factual to find connections of the project team with the environment. The way the connections are perceived relies on the individuals studied. The final part is about applicability of the outcomes. Again, the realistic approach was followed to validate the outcomes on multiple organizational levels.

A research paradigm is a way of studying social phenomena, so a specific understanding of the phenomena can be acquired and explanations can be found (Saunders et al., 2011). For this study, the functional paradigm and the radical structural paradigm are relevant perspectives. In the functional paradigm researchers are looking for a rational explanation for a particular problem in the organization and develop recommendations within the existing structures. In the radical structural paradigm the purpose of the study is to create a fundamental change on the basis of an analysis of phenomena such as power relations and conflict patterns. In this paradigm researchers are studying structural patterns in organizations, such as hierarchies and capturing relationships, and the extent to which it may be malfunctioning. This research is based on a functional paradigm. Though designed to explore relationships and conflict patterns, the outcomes are expected to fit within the existing structures. But as it comes, some conclusions might be experienced as radical for some.

1.5.2 Methods applied in this research

In social sciences primarily inductive research is performed, meaning that researchers use a variety of methods to collect mostly qualitative data to find different interpretations of phenomena. The research is mainly concerned with the context in which events take place. This research has been prepared based on a mixed methods approach (Creswell, 2013). For the exploration of the phenomenon *collaboration between public and private partners in a project* both qualitative and quantitative methods were used in the research steps. The objective of each step was different, so were the identified key issues and key variables. The study of smaller samples fitted this research design. The focus was always on the organizational elements that distort or support the relationship between public and private project partners.

In the first part of the research the sub-question was: what organizational difficulties do public project managers face? For a broad view on this theme the answer was provided in three different ways (triangulation): by studying literature, by exploring organizational difficulties in four cases and by interviewing four public project managers on difficulties in their role. The exploration of these four cases identified the success criteria at different organizational levels as important key issues; especially the lack of common success criteria for both parties. This raised a new question about the purpose of the collaboration. Though the historical context in the cases could partly explain the external pressure for public private partnerships, it was wondered how collaboration was intended and perceived by the public project managers who actually were in this situation. The public side was especially relevant, since this side chooses the (private) partner. So the objective of the exploratory interviews with four public project managers was to identify their view on factors influencing project success or failure and the role of the public partners in this success or failure. Parallel to the exploration of the cases a literature study on public private collaboration and project success was conducted. The exploratory

interviews indicated a specific view on project success that did not match with the results of the literature study.

The next research step was still exploratory: identifying success criteria of public project managers. Therefore the second sub-question was formulated: What is project success for the public project manager? Q-methodology was used to identify different perspectives that public project managers hold on this subject. With the results the common success criteria and the conflicting criteria were identified. This part of the research was extended abroad. Combined with Hofstede's theory this part of the approach was descriptive (Hofstede et al., 1991). The results were not in line with the expectations. It revealed other variables than national culture for the preferences in success criteria. In both the Dutch research as in the research in Western Europe, the perspectives showed an important connection between the project level and the parent organization.

In the third part of the research the sub-question was: How does the governmental organization influence the collaborative relationship with the project partner? The objective of the descriptive research performed in the network of the project management teams of public and private project organizations was to accurately describe relationships of the project management teams with stakeholders, the purpose of their involvement in the project and their influence on the collaboration. The performed social network analysis identified specific organizational strengths and weaknesses in the connections of both project management teams. The cross-case analysis that was performed on the cases had an explanatory character. From this, five assertions were derived that describe the major influences from stakeholders on the public private cooperation.

The final part of the research was about validation and applicability of the findings. The sub-question to be answered was: To what extent can the developed approach be used to improve the efficiency of the public and private actions? To answer this sub-question the public success criteria, the relationships and the influence of the relationships on the project were combined. This resulted in a Public Value Chain model, accompanied by several recommendations. These were presented to a panel of representatives of the public and private parent organizations and the public and private project managers in an expert meeting. To strengthen the results, links with literature were established where possible.

1.6 Scientific and social relevance

In terms of scientific relevance, a few elements are addressed. The almost 60 interviews with public project managers provide insight in the different perspectives in this specific subgroup.

At this stage project managers are mainly approached as a homogenous group. The public side of public private partnerships is mostly addressed as *the client*, not being involved in an active role. The second element of the research to be addressed is the mainly exploratory character of it. This PhD research explores current mechanisms, with much emphasis on current failure or at least troublesome processes. A lot of research in this field is based on survey results in which the desired situation, most favorable issues or positive elements are gathered. Fact-finding at management level in projects is expected to result in improving understanding of project management practice.

Though the issue of trust between two cooperating partners is addressed by many others, Van Ham and Koppenjan (2002) explicitly promoted better institutional factors (more explicit agreements between actors on practices and procedures) for enhanced relationships. Pinto and Winch (2016) made a plea to consider these institutional factors of the project organization in a broader context. According to these researches the future research fields for the Management of Projects involve the interface with other organizations surrounding the project and looking for connections between management and other processes in the parent organization (Pinto and Winch, 2016). This research contributes to more insights in both aspects. In addition, this study contributes to Winch and Leichner's findings that the owner of the infrastructure is an important factor to consider in enhancing project success (Winch and Leiringer, 2016). Public private partnerships are more often subject of study in Belgium and The Netherlands. After studying 14 resent PhD-researches Heuskes et al. concluded that future research should exceed a specific public or private perspective (Hueskes et al., 2016). This research combines public and private perspective at tactical level and offers a framework for explicit organizational factors connecting the combined organization to the parent organizations and owners of assets.

Driven by the changes in the industry, several trends emerged showing the necessity to collect and share knowledge and experiences on the topics studied in this PhD research. People working on the government side have started the initiative to share their knowledge and experiences. Several network organizations were initiated since 2008 by a growing number of governmental organizations. They aim at improving the quality of public and private cooperation in infrastructure development by forming a cooperation program and a network (KennisINhetGroot (private), Rijksprojectacademie (public), from 2014 together in Neerlands Diep). This research is set up to contribute to the knowledge development on management of public projects via collaborative public private partnerships. This knowledge can be used by both public as well as private project practitioners to better understand the mechanisms within public project organizations for infrastructure projects.

1.7 Dissertation outline

The four identified parts of this research are reported in this dissertation as follows. The first exploratory part is presented in Chapter 2 (Literature), and Chapter 3 (Case analysis and explorative interviews). The perspectives of public project managers on project success are presented next: Chapter 4 presents the Dutch perspectives and Chapter 5 the perspectives from public project managers from different Western European countries.

In Chapter 6, the networks of the core project teams in three different cases are compared. Chapter 7 presents the data more in detail of the three in depth case studies that accompanied these studies. In Chapter 8 the Public Value Chain model is presented, supplemented by the feedback of experts on the model and recommendations.

The last chapter, Chapter 9, provides the discussion as well as the conclusions and recommendations for further research. Figure 1-2 illustrates the coherence between the chapters and research parts.

Figure 1-2 Positioning the sub-studies and sub-results in this research

Part I	Introduction to the subject		Chapter 1	
	Literature review	Case analysis and Explorative interviews	Chapter 2, 3	
Part II	Additional literature	Q-sort succescriteria on Dutch Public PM	Chapter 4	ECAM
	Additional literature	Q-sort succescriteria NW-European Public PM	Chapter 5	IJPM
Part III	Additional literature	Case study – Cross case analysis	Chapter 6	IJPM
		Case study – Network analysis	Chapter 7	
Part IV	Additional literature	Expert-meeting	Chapter 8	
		Discussion, Conclusion, Recommendations	Chapter 9	

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Chapter 2 Literature review

Abstract

Project management traditionally involved the process of controlling the achievement of the project objectives. The success of a project was expressed in terms of *within budget, within time* and *according to specifications* (Atkinson, 1999; Shenhar and Wideman, 1996). As result of the dynamic project environment, other approaches were developed and attention was paid to interaction with contextual elements (Al-Tmeemy et al., 2011; Westerveld, 2003). Also other criteria to express the success of a project were introduced, for instance *perceived performance, commercial success* or *satisfies the needs of the client* (Davis, 2014; Jugdev and Müller, 2005). The factors to influence the performance are also subject of study. Former research identified several factors to influence the performance; some can be influenced by practitioners in the project, others cannot. Most dominant success factors found were (soft) factors that involve both client and contractor, like teamwork and cooperation.

Studying cooperation in projects starts with selecting the level of interest: organizational, team or individual level. Considerable difficulties are reported in embracing the collaborative concept from organizational level to team level and in translating the high-level agreement reached to practice (Bresnen and Marshall, 2000a). Achieving and sustaining cooperation of individuals is one of the challenges in the construction sector (Anvuur et al., 2012). To enhance effective teamwork, the competencies of team members, integrating organizational mechanisms and a joint project culture have to be taken into account (Salas et al., 2005, Suprapto et al., 2015). Compatible cultures ensure coherence between collaborating organizations and teams (Mankin et al., 2004), but public and private organizations differ fundamentally (Smit and Van Thiel, 2002). In public private partnerships the public partner is supposed to behave as businesslike as possible within the boundaries formed by their public duties. Both public and private project manager act on the interface of their organizations and have to deal with the values of both organizations and the friction that can entail. These project managers have a leadership role in creating an effective organizational culture for the project.

2.1 Introduction

Over the past decades, much has changed in the relationship between government and business partners in the infrastructure sector. Various reasons can be appointed for this change, like the government's withdrawal driven by political ideology, the need for additional funding and the search for more efficiency. Intended benefits of the changes include increased value for money and more opportunities for innovation. Severe differences between public and private partners in organizational culture and orientation towards projects, provide enough ingredients to understand the difficulties managers of public private project organizations have to deal with.

The main purpose of this research was to contribute to increasing the number of successful projects performed by public private organizations. Moreover, it focused on the organization of cooperation between public and private partners. This chapter presents the literature review which was performed to build knowledge on the themes *project management* (Section 2.1), *working together in projects* (Section 2.2) and *public private partnerships* (Section 2.3). Literature on project management was relevant for knowledge on the controllability of the project activities, *working together* was relevant to understand cooperation and collaboration and finally literature on public private partnership was relevant for the differences in the organizational culture and orientation in public and private organizations and the way this influences the cooperation. The subtheme project success or project performance was found within all themes.

These concepts were investigated from a wide perspective, with a dominance on journal articles, because of the general accepted scientific value of journal articles (peer-reviewed). The literature research is performed with special attention to journals with a focus on project management and construction industry, like the International Journal of Project Management, Construction Management and Economics and the Journal of Management in Engineering. Attention was paid to relatively recent published articles, often cited articles and articles that summarized a review of other articles. If considered relevant, articles referred back to were included in the literature review.

2.2 Successful project management

2.2.1 Project management

Projects and the Management of Projects are widely discussed subjects in literature for several decades. Over time several definitions of *project* and *project management* are introduced (Munns and Bjeirmi, 1996; PMBOK®, 2008; Turner, 1999). The common elements in these

definitions are that *a project* is set up to achieve a specific objective, which involves a certain scope of work within set specifications. *"Project management can be defined as the process of controlling the achievement of the project objectives"* (p. 81, Munns and Bjeirmi, 1996). The traditional project management was based on a systems approach; treating the project as a mechanical system and with a focus on tools and techniques for the Management of Projects (Bosch-Rekveldt, 2011; Winter et al., 2006). From this approach a number of handbooks and bodies of knowledge stem, all meant to be a reference guide to techniques for controlling the activities to achieve the project's objective, for instance Turners Handbook of Project Based Management (Turner, 1999), Meredith and Mantel's Managerial Approach on Project Management (Meredith and Mantel Jr, 2009), The Oxford Handbook of Project Management (Morris et al., 2010) and the PMBoK by the US based Project Management Institute (PMI).

Despite the development in professionalization of project management and the range of tools and systems available, project performance was still far from good (Bakker et al., 2010; Cantarelli, 2011; Flyvbjerg et al., 2003b; Morris and Pinto, 2004). The traditional tools based approach seemed inadequate to ensure successful delivery of projects. Projects became increasingly more complex and uncertain over time as a result of the dynamic environment (Bosch-Rekveldt, 2011; Koppenjan et al., 2011; Suprapto, 2016). Though the PMBoK mentioned that a project had to be considered in its context, no attention was paid on how to interact or react with contextual elements. New conceptual approaches in project management were developed with more emphasis on the context of projects (Hertogh and Westerveld, 2010; Pryke and Smyth, 2006; Shenhar, 2001; Shenhar and Dvir, 2007; Suprapto, 2016). Pryke and Smyth (2006) summarized four complementary approaches to project management. Next to the traditional approach, they distinguished a functional approach that covered strategic variables, an information processing approach with a focus on the information flows and a relationship approach that puts emphasis on the stakeholders in the project. According to the researchers these approaches should all be taken into account in managing projects. It illustrated a general development in project management research and practices which evolved from a focus on tools and techniques to an exploration of behavioral and social elements in the project team (Ahola, 2009; Bresnen and Marshall, 2002).

In line with the evolution in the range of elements project management should include, a development in the phases covered by the term *project management* took place. Traditional project management mainly focused on a controlled execution of the scope. Later on the project lifecycle was included in the scope, in literature referred to as the *Management of Projects* (Morris and Pinto, 2004; Pryke and Smyth, 2006). The project lifecycle covered the phases from the project definition until the hand-over of the project result to the client. In this approach the purpose of a structured, phased project management process, was to ensure a logical

sequence of activities for a refined understanding of the feasibility of the project objectives and the associated risks (Bosch-Rekveldt, 2011). On this basis, at the end of each phase, it can be decided whether the project will be continued and whether further investments are justified. The phases are named differently in literature, but the activities are similar, leading to the final investment decision before starting the execution phase (Gibson Jr et al., 2006; Turner, 2009). The phases before the final investment decisions are together called the pre-construction phase (for instance in construction industry) or the Front-End Development phase (for instance in process industry). The activities in the pre-construction phase were appointed to be of decisive importance to maximize the added value of projects (Hutchinson and Wabeke, 2006). From this insight new contractual arrangements were developed. Traditionally, the contractor was involved after the pre-construction phase (Cox et al., 2006a), now new contract forms were developed to involve the contractor in the pre-construction phase (Bresnen and Marshall, 2000a, 2002; Thompson and Sanders, 1998). This way the knowledge about execution methods was supposed to be accessed earlier in the project.

From the point of view of each participant in the project life cycle, the activities in their own scope form a project. Each participant is managing his own project. So the scope of a *project* and *project management* depends on the point of view taken. The *Management of Projects* in this approach, is the total of the combined activities of the participants. In this PhD research *project management* is referred to when appointing the activities of a partner in managing his project. And in that manner, for all participants that are actively participating in the project's lifecycle.

2.2.2 What is project success?

What is a successful project and what is known about influencing project success? Project success is a widely discussed subject in literature (Munns and Bjeirmi, 1996; Pinto and Slevin, 1988; Shenhar et al., 2001; Turner, 2007; Westerveld, 2003). To determine whether or not project success has been reached, one judges the project by means of a set of standards. This set of standards differs per project. A standard by which project success is judged, is also known as a *success criterion*. In the early days of project management it was said that projects were successful if they were delivered in time, within budget and satisfied the set quality measures.

These three measures of success are also known as the *iron triangle* (Atkinson, 1999; Jha, 2011), the *triple constraint* (Conchúir, 2011; Mantel and Meredith, 2009) or more positively the *golden triangle* (Westerveld, 2003). Over the last 35 years various researchers have made significant contributions to knowledge of project management by moving from the traditional way in measuring the success by focusing only on time, budget and quality by introducing more

dimensions of project success, like satisfactory (commercial) benefit to client organization, perceived performance, technical performance, meeting functional specifications, commercial success or satisfaction of the needs of the client (Baccarini, 1999; Chan, 2001; Davis, 2014; Jugdev and Müller, 2005; Sanvido et al., 1992). Knowledge of the different kinds of success of a project (success criteria) is relevant for two reasons. Firstly, it will help to specify the type of success referred to and pursued by the different participants in the project. Secondly, because it helps to develop an appropriate decision making system that may help managers to make better decisions which lead to project success (Al-Tmeemy et al., 2011). Decisions are made on so called *success factors*, factors influencing the success. As different participants refer to different types of success, the success factors are different and so are the issues to decide on.

To determine the place of the triple constraint criteria within the project management theory, Munns and Bjeirmi (1996) developed a model in which a distinction was made between project success and project management success. They related project management success to the success of the planning and production phases of the project and project success to the whole lifecycle of the object created in the project (including the utilization, hand-over and close down phase). This distinction between project management success and project success is used by a number of authors, though the terms to address this vary. De Wit (1998) made a distinction between the *project success* and the *success of the project management effort;* Ogunlana and Toor (2010) differentiated *micro success* and *macro success*; Shenhar et al. (2001) used the terms *project success* and *product success*. Al-Tmeemy (2011) used a timeframe to categorize the dimensions Shenhar had found in his researches (Shenhar, 1997, 2001). He introduced the dimensions short term, medium term, long term and very long term and categorized 14 success criteria in these dimensions (Figure 2-1). All authors agree on the fact that project success is a multi-dimensional concept (Al-Tmeemy et al., 2011; Phua and Rowlinson, 2004; Shenhar and Wideman, 1996; Toor and Ogunlana, 2010). Therefore research on increasing the rate of project success has to be specific in the type of success referred to.

Figure 2-1 The four dimensions of project success, based on Shenhar (1997, 2001)

	Short-term goal	Medium-term goal	Long-term goal	Very long-term goal
Time frame	Short-term goal	Medium-term goal	Long-term goal	Very long-term goal
Success category	Project efficiency	Impact on Customer	Business and direct success	Preparing for the future
Key success	Meeting: - Time - Budget - Requirements goals	Meeting: - Performance measures - Technical specifications - Functional requirements	Meeting: - Commercial success - Market Share - Revenue and profits	Developing new: - Opportunities for the future - Technology - Techniques - Products - Markets

Combining the frame of Shenhar (2001) with the definitions Munns and Bjeirmi (1996) developed, it is concluded that project management success has to do with the efficiency of the pre-construction and execution phase and can be judged in terms of the triple constraint. Product success indicates the effectiveness of the project result and can be judged at earliest in the utilization phase. The criteria Shenhar (2001) distinguished for long-term and very long-term success, like commercial success, market share, profits, fit commercial organizations but are less suitable for public organizations. As stated in Section 2.2.1 the scope of activities depends on the participants. In collaborative relationships in projects a part of the timeline is shared by partners. A number of studies have tried to gain insight in the key success criteria used by the different participants (Bryde and Robinson, 2005; Frödell et al., 2008; Lim and Mohamed, 1999; Turner, 2007). In several researches differences of perspective are pointed out (Chan et al., 2004b; Koppenjan et al., 2011; Kort, 2005). Implicitly PMI enclosed the importance of the perspective in the success of project management in their definition of project management in which they included the *acceptance of the project by the project's stakeholder*. Hence the judgement of project performance is done by the projects stakeholders.

Stakeholders is a comprehensive term used to describe all actors that the project managers and clients cannot disregard while developing the project (Bryson, 2004) or all individuals and groups that have a special interest in the project or are affected by the outcome (Mantel and Meredith, 2009). This encompasses such a significant collection of groups and individuals, with certainly some conflicting interests, that the project management team will never be able to satisfy all different requirements. Therefore, a research in which a project outcome would only be considered successful if stakeholder expectations were met would lead to limited successful projects – or the definition of stakeholders should be greatly altered (English et al., 2009). So, to adequately determine whether or not a project is a success, multiple criteria are

necessary, though they might possibly be contradicting (Atkinson, 1999; Jugdev and Müller, 2005; Westerveld, 2003). Hence, when studying project success criteria researchers have to not only be specific in the type of success referred to, but also precise in describing the view point studied.

In this dissertation the project organization of public and private organizations is the object of research. The public organization is *the client* from the point of view of the contractor. The project manager in the public organization on his turn, has his own client to which he delivers the project. The client is the person or organization that takes the initiative to start the project and provides the financial resources, with the aim of reaching a certain goal and ending up with a certain product. Client organizations can in fact be either public or private (Boyd and Chinyio, 2006). However since by far most infrastructure projects in The Netherlands are executed by public organizations, this research focuses solely on public clients for infrastructure projects. The client of the public project manager is the organization that provides the budget for the project, often the parent organization, also called owner or supporter, or an combination of governmental organizations (Cheung et al., 2010; Hertogh and Westerveld, 2010; Jugdev and Müller, 2005). Following the research of NETLIPSE (Hertogh et al., 2008) and Hertogh and Westerveld (2010) the public part of the project organization is indicated with project delivery organization (Figure 2-2). The part of the public parent organization from which the public delivery organization receives its assignment, is called the client-owner (Winch, 2013). Researchers have given little attention to the interfaces between the project organization and different types of permanent organization that configure any project (Pinto and Winch, 2016; Winch and Leiringer, 2016).

Figure 2-2 Interfaces between organizations involved
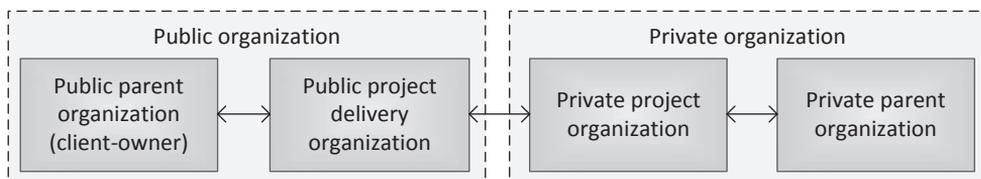
Private perspective

The project manager of the contractor has a focus on meeting the goals of his client within the given constraints. In 2011 Al-Tmeemy conducted research especially on contractors in construction industry. He selected 13 success criteria from literature and developed a questionnaire about the criteria required for the success of a project from the perspective of contractors (in Kuala Lumpur, Malaysia). The results, shown in Figure 2-3, based on 151 completed questionnaires, match with the framework of Shenhar (Figure 2-1). Al-Tmeemy et al.

(2011) used the term *project management success* for the short term goals, *product success* for the medium term goals and *market success* for the long-term goals, to which he added *reputation* as a fourth criterion. The term market success illustrates that the success criteria of this dimension match a commercial organization, not a public organization. For the contractor project success is a strategic management concept where project efforts must be aligned with both short and long term goals of the company (Al-Tmeemy et al., 2011).

Figure 2-3 Success criteria for building projects, contractor perspective (Al-Tmeemy et al., 2011)
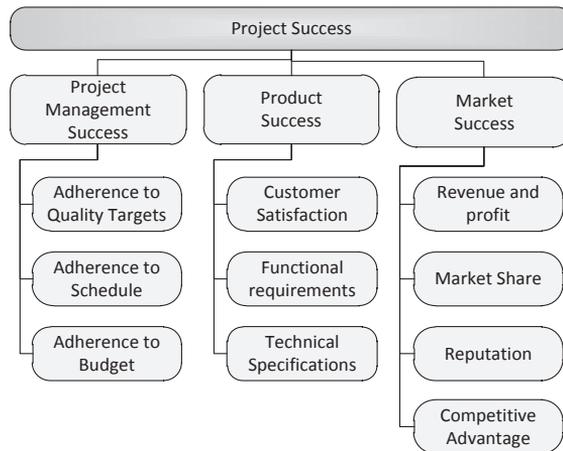
Public perspective

Public and private organizations are fundamentally different types of organizations (Smit and Van Thiel, 2002). They have different goals, working methods and they operate in a different environment; a public organization works in an environment influenced by politics. Public organizations and public management are subject of study in different branches and different levels (Boyne, 2002). Research on public project management in public private projects often studies the interaction and the decision making process between the managerial levels in the public organization (Klijn and Koppenjan, 2000). At the political or strategic level the long- term decision making takes place. Politicians and top management focus on policy making; they think of the direction the organization needs to follow, how the organization should develop in the long-term and how the long-term objectives are going to be achieved. A level below is the managerial or tactical level, which forms the link between the strategic and the operational level. This organizational level considers how the political decisions have to be implemented at the operational level and have to transform the political decisions to operational assignments. The tactical level in public organizations focuses (more than in private organizations) on producing documentation that establishes the public value of the project.

In relation to infrastructure projects conducted by the national government, the levels can be distinguished by means of an implementation order giving the assignment for the execution of a construction project (Koppenjan et al., 2012). The order to implement a project is given at the political level. This decision making process and the order are for the politicians a *"tool [used] for steering and accountability purposes. The political requirements are formulated in the order (...) that form the political boundaries within which the project should be realized – mainly time and money – and it determines responsibilities"* (p. 15, Koppenjan et al., 2012). The managers at the tactical level have two roles as a result of their intermediate position, they are both commissioner and commissionee, *"They translate political orders to a feasible order and take care of the tuning of the order to other policy and to the available resources within the organization"* (p.15, Koppenjan et al., 2012). This managerial level assigns the project to a public project manager for the execution of the assignment. The public project manager is given an implementation order, which provides him guidance on the direction of the project, the means and the preconditions set for the project. The *implementation order* describes what the public project manager is accountable for. Though this employee is a project manager in his own organization, he is the client in relation to the contractor and has the client's authority (Boyd and Chinyio, 2006; Koppenjan et al., 2012). The roles of this individual are subject to the point of view taken. Therefore, in this PhD research, this representative of the public organization is indicated using the term *public project manager*. The public project manager is *the person in the role where he has contact with the contracting party and takes on this execution assignment within his own organization.* As the measurement of success of projects depends on the viewpoint taken, it is the viewpoint of this public project manager that is of interest while aligning the success perception of client and contractor in construction projects.

Literature concerning the owner-contractor relationship, in which the owner is not (explicitly) a public owner, is interesting for this research because of similarities in the interaction between partners with different points of view on project success. A study performed by Bakker et al. (2010) based on a survey of 38 project managers from the Dutch process industry showed how owners in process industry have a lack of interest in the success of their partner. Bakker et al. (2010) showed that the focus of the owner is very much into own profits and far less into partnerships and contractor gains. In general, the contractor groups have more focus on the commercial success of the owner, while the owner shows little interest in the commercial success of the contractor. These differences can be an indication for differences in the owner- contractor relationship in public private partnerships. Other relevant research has been conducted by Bryde and Robinson (2005). Their research into comparing the importance of certain criteria to either the client or the contractor was done in the housing branch. The researchers found a connection between the client success criteria and the distance between the client and hís client; in this case the final user of the product. If the final user was unknown

the client of the contractor used other success criteria than when the final user was known. If the final user was known to the client of the contractor, he could better specify the success criteria considering hís (paying) client. Hence, the perspective taken and the specific circumstances related to that perspective play a crucial role in determining the relevant success criteria. A public organization is a different type of organization than a private company. Their success criteria are expected to be influenced by their political and social context. Therefore the literature focusing on private clients cannot just be translated to suit the public client. However, which success criteria are to be used for public organizations is currently still unclear. Though there is an increasing attention for other views on success (Bakker et al., 2010; Jugdev and Müller, 2005; Toor and Ogunlana, 2010), real insight in the public project manager's success criteria is still lacking. In Chapter 4 and 5 a contribution is made to filling this gap.

2.2.3 Factors affecting the success

In studying project success a distinction is made between success criteria and success factors. Success criteria, sometimes indicated as Key Performance Indicators (KPI's), are the indices that measure if or in what way the project was a success. Section 2.2.2. focused on the possible success criteria. Success factors are *"those levers that project managers can pull to increase the likelihood of achieving a successful outcome for their project"* (p. 412, Westerveld, 2003). Factors affecting the project success are addressed in several researches (see, for example Bakker and De Kleijn, 2014; Belassi and Tukel, 1996; Cooke-Davis, 2002; Munns and Bjeirmi, 1996; Pheng and Chuan, 2006; Pinto and Slevin, 1988; Van Aken, 1996). This section gives an overview of the different factors found in several researches and the clustering used. Notice that researchers on success factors use different definitions of project success or no specific definition at all. The applicability of the success factors for achieving project success from a specific point of view, or measured in specific criteria is therefore difficult to judge. Yet, the clustering and the frequency of factors mentioned can indicate elements that need to be taken into account when studying improved project performance in construction projects conducted by public and private partners.

Early research on project success factors was done by Pinto and Stevin (1988), who identified 10 factors a project manager should take into account for successful project implementation. They distinguished project mission, top management support, project schedule / plan, client consultation, personnel recruitment, selection and training, technical tasks, client acceptance, montoring and feedback, communication and trouble shooting. In the developed model based on these factor, the researchers emphasized the interdependency and time sequence of the factors. Munns and Bjeirmi (1996) made a distinction between *hard* and *soft* factors. As *hard* factors they considered the techniques in project management, like project planning, breakdown structures, or client information sheets. People skills were considered *soft* factors;

personal, technical and organizational skills (Munns and Bjeirmi, 1996). At the same time Van Aken (1996) showed the importance of specific soft issues; the composition of the team and cooperation of team members in the project. Belassi and Tukel (1996) added a clustering in factors within the control of the project manager and success factors outside the control of the project manager. Based on the review of seven major journals (43 articles) in the construction field Chan et. al. (2004) identified 44 factors affecting project success and presented these in a framework with five major groups of independent variables: project management actions, project procedures, external environment, project-related and human-related factors. The latest was also the largest group and was divided in (a) clients' capabilities and (b) the project team and the project leader's capabilities. The importance of both groups is established by other research, for instance Wortman and Kremer (2011), who pointed to the project manager of the client, Pheng and Chuan (2006) who mentioned clients' actions before, during and after the project or Prabhakar (2008) who identified the project manager himself as an important factor leading to project success. Munns and Bjerimi (1996) linked the contribution of the client as well as the contribution of the project team to the different project phases. These researchers stated that the project manager must allow the client to contribute actively in the planning and production phases and at the same time the project team involvement has to be extended into the utilization phase. In 2004 Phua and Rowlinson published the results of their research to identify the success factors specifically in construction projects. Their results indicated two predictive factors: cooperation (further divided into *cooperation with team members of the other organization* and *cooperation with the team members of the own organization*) and contractual characteristics. The study focused on the perspective of the contractor and the consultant. The perspective of the client / owner as part of the project was not considered, which is unfortunate considering the importance of the clients' contribution as mentioned before (Pheng and Chuan, 2006; Prakash Prabhakar, 2008; Wortmann and Kremer, 2011).

Literature referred to in this section shows there are many different factors influencing the success of the project. The point of view is hardly specified in the conducted researches. If specified, it hardly considers a client-owner perspective. The relationship between specific factors and specific success criteria is seldom studied, with few exceptions (Phua and Rowlinson, 2004; Westerveld, 2003). Various studies show a relationship between the formal aspects of a joint contribution to the project and the achieved project success, like the procurement method or the contractual characteristics (Chan et al., 2004a; Phua and Rowlinson, 2004). Most dominant success factors in literature are (soft) factors that involve both client and contractor, like teamwork and cooperation (Chan et al., 2004b; Pheng and Chuan, 2006; Phua and Rowlinson, 2004; Prakash Prabhakar, 2008; Suprapto et al., 2014; Van Aken, 1996; Wortmann and Kremer, 2011).

2.3 Working together in projects

2.3.1 Inter-firm collaboration

Every construction project typically involves cooperation between clients, designers, constructors, subcontractors and suppliers working together to deliver a construction product or service (Anvuur and Kumaraswamy, 2007; Cox et al., 2006b). When studying the phenomenon of *working together* several terms are used. To indicate a mutual agreement to work together on organizational level terms as partnering (Black et al., 2000; Bresnen, 2007; Bresnen and Marshall, 2000a), alliancing (Douma et al., 2000; Kale and Sigh, 2010), inter-firm collaboration (Angel, 2002; Rosenfeld, 1996), inter-firm partnership (Hagedoorn, 2002), inter- organizational interaction (Dulaimi et al., 2003; Jones and Lichtenstein, 2007) or inter- institutional (Dille and Söderlund, 2011) are used. The tactical level on which the involved teams of separate organizations give interpretation to the intentions of *working together* on organizational level, is implicitly part in the researches that refer to the inter-firm level. If mentioned explicitly this is called inter-team or inter-group interaction (Anvuur and Kumaraswamy, 2007). The phenomenon *working together* can also be considered on personal level, between individuals of the same team or between individuals of two cooperating teams. Recently Suprapto et al. (2015) defined owner-contractor collaboration as "a process in which owner and contractor jointly create norms, rules, and structures governing their teams, their working relationships, and ways to act or decide on the issues emerging during the course of a project, in order to bring about mutually satisfactory project outcomes". Authors explained the explicitly chosen interaction levels in this definition: that between two permanent organizations and that between two project teams. Thus, studying cooperation in projects, the level on which the cooperation is considered, must be clear. For this PhD research, the inter-firm and inter- team level are of interest.

The degree of cooperation is often referred to by the use of the terms cooperation (Anvuur et al., 2012; Bresnen and Marshall, 2002; Chan et al., 2004a) and collaboration (Bresnen and Marshall, 2000a; Leufkens and Noorderhaven, 2011; Rosenfeld, 1996). Thomson and Sanders (1998) positioned these terms as two of four stages of increasing involvement of organizations in the partnership. Their first stage referred to the traditional owner-contractor relationship in which the element of *working together* is minimal, the fourth stage represented the maximum integration of cultures, shared risks and implicit trust and was indicated with coalescence. The stages between represented increasing degrees of objective alignment and commitment by the involved parties and are labeled cooperation (stage two) and collaboration (stage three). In their contribution to the book 'Collaborative relationships in construction' Anvuur and Kumaraswamy presented a broad overview of definitions for and differences between cooperation and collaboration (Smyth and Pryke, 2008). The collaboration tended to be across, rather than within organizational boundaries. A collaborative approach is often found in indicating a

combined goal, with separate actors that are contributing to the common goal. In construction projects client-contractor relationships became more collaborative, indicated by terms as partnering and alliancing (Bresnen and Marshall, 2000a). For the construction industry Anvuur and Kumaraswamy showed that cooperation often refers to joint accomplishment or collective action and refers to behavior as well as a process leading to mutual gains or benefits. In formulating success factors cooperation is mentioned as an activity of which the quality is predictive for success. Collaboration is an organizational form in the conditions to develop the optimal quality of cooperation. A clear distinction between collaboration and cooperation, however, was not widely found in literature. Moreover, in Dutch both words are translated into the same word *(samenwerken)*. In this PhD research, cooperation is used for processes where people work together to accomplish their individual or own organizational goals. The term collaboration is used for processes where people work together to accomplish a common goal.

Collaborative arrangements between firms are indicated by several terms in literature, like partnering, alliances and public private partnership. Some definitions of these terms refer to the duration of the arrangement or the number of projects that is executed in the arrangement (single or multiple) (Phua and Rowlinson, 2004). The terms are also used interchangeably (Anvuur and Kumaraswamy, 2007; Bresnen, 2007). Researchers agree on the fact that collaborative relationships should be based on trust, dedication to common goals, understanding of each other's individual expectations and values (Naoum, 2003; Van Ham and Koppenjan, 2002). Strategic fit between the partners is an important requirement for a successful partnership (Carmeli et al., 2010; Child et al., 2005; Thompson and Sanders, 1998; Zaefarian et al., 2013). The underlying concept of a strategic fit is the possible achievement of synergies through the use of complementary assets and competences (Geringer, 1991). The fundamental issue in assessing strategic fit is whether the joint value chain of the partners seems likely to achieve sustainable advantage for the partners (Child et al., 2005). But researchers also conclude that the strategic fit receives too little attention at the start of a collaborative relationship (Bellinga, 1997; Bresnen and Marshall, 2002; Douma et al., 2000).

Potential partners try to find out as much as they can about each other and then compare the information obtained against a range of selection criteria in order to assess the degree of strategic fit between themselves (Faulkner, 1995; Geringer, 1991). Elements of consideration are common goals, commitment of the senior managerial level, interdependency, the willingness to invest in the relationship and agreement on joint decision-making. Both partners have their own reasons for cooperation and their own goals; each organization wants to ensure its reasons to cooperate in a common plan. A common business case can be the product of a strategic fit of partners. In a public private partnership the process to find a matching partner and to ensure strategic fit is challenging. Due to the unique position of the government as single owner of

public assets, the public partner is obliged to follow international procurement regulations (Enquetecommissie, 2002; Thai and Grimm, 2000). In this procurement process the public partner sets the requirements and the potential private partners offer their plans with associated prices. In this procedure all participants take much consideration of their own part of the deal, but in the procedure of selecting a partner is little room for interaction to increase the strategic fit. Thus, the procurement process does not contribute to the desired starting situation for good partnership, as demonstrated by several studies. For instance Bresnen and Marshall (2000) showed that in a *buyers' market*, it is always tempting for clients to shift risks onto the supply side and to press for changes in their methods of operation. Having observed and studied different projects that use the partnering approach, Ng et al. (2002) concluded that there are several issues which lead to ineffective project partnering. One issue was the unwillingness of the client to fully commit to work together with the supplier and share responsibilities.

A strategic fit is the first step towards a good cooperative or even collaborative relationship (Bellinga, 1997). Continuously maintaining shared goals and information is critical in the formation of an integrative and collaborative environment where the intentions are converted into cooperative behavior. Research of Bresnen and Marshall (2000) showed difficulties to convert partnering arrangements into real behavior at construction sites, were operations are influenced by a wide range of factors. For a cooperative relationship on operational level, other types of fits have to be taken into account.

The main challenge for the partnering organizations is the management of the collaborative activities. Activities of (personnel of) both organizations contribute to reaching the common goal. Different types of relationships show a difference in the integration of common activities. One should also consider the necessary flexibility in the style of working of the organization and the mandate of the manager (Bellinga, 1997; Douma et al., 2000). Akintoye et al. (2009) specified the organizational fit for public private partnerships. Before entering a partnership with a public organization, this research recommended the private partner a specific investigation of the client's (p. 247-248):
- Hierarchical organizational structure, and the client's key activities and processes that have impact on the project;
- Decision-making structures and how this will interface with the project teams and the communication networks anticipated for controlling the project;
- Delegation of executive power to the project sponsor or project manager;
- Future dynamics in the context of the organizational change.

To fulfill this recommendation, the private partner must be in a position to obtain the necessary information in the procurement process and understand it timely. The lack of continuous open

communication among all stakeholder parties and the problem of dealing with large client organizations is an issues at the supplier side in forming a partnership (Ng et al., 2002). Klijn et al. (2008) showed that the collaboration in public private partnerships requires much effort and time, which interferes with the progress of the project. Researchers did not indicate what the private partner should do to transform the information obtained in a successful partnership. Nor how a public organization can apply this knowledge.

2.3.2 (Inter) Team cooperation

Once the partners have chosen each other, collaboration must be further developed by the people who actually work on the project. Especially by the people who work at the interface of the two organizations. A public private partnership agreement is arranged for a specific project, which means that the project team is newly formed by people who did not work together before (Black et al., 2000; Dubois and Gadde, 2002). Collaboration has become more complex as it involves multiple people, diverse organizations, multiple agenda's among others (Mankin et al., 2004). Achieving and sustaining cooperation of individuals is one of the challenges in the construction sector (Anvuur et al., 2012). Considerable difficulties are reported in disseminating the collaborative concept throughout the organization and in translating agreements, reached on strategic level, to practice (Bresnen and Marshall, 2000a). Highly motivated people in the team, interested in the activities involved in the project, are preferred (Troanca, 2011). Contractual incentives, like risk/reward elements, do not motivate staff (Bresnen and Marshall, 2000a), however a project manager can create an environment that is motivating (Troanca, 2011). The literature shows that teambuilding sessions, which are common in construction industry, contribute to creating group identity and cohesion and encourage collective ownership (Bresnen and Marshall, 2000a). These teambuilding sessions seldom involve lower hierarchical levels and reactions of team members vary from enthusiasm to skepticism. Joint project offices used to co-locate teams, are beneficial to a larger part of the team members as the (informal) communication between teams becomes easier and a common project culture can be established, which strengthens collaborative behavior (Bresnen and Marshall, 2000a; Doloi, 2009).

Creating a team is one thing, making them perform effectively is another challenge. Salas et al. (2005) accomplished a thorough overview of literature on creating an effectively performing team. They defined teamwork as *"a set of interrelated thoughts, actions and feelings of each team member that are needed to function as a team and that combine to facilitate coordinated, adaptive performance and task objectives resulting in value-added outcomes"* (p. 562, Salas et al., 2005). They identified five dimensions necessary within the team and three coordinating mechanisms that together lead to effective teamwork. The dimensions presented here were (1) team leadership, (2) mutual performance monitoring, (3) backup be-

havior, (4) adaptability, and (5) team orientation which required coordinating mechanisms of *(i)* shared mental models, *(ii)* closed-looped communication, and *(iii)* mutual trust. More recently Suprapto et al. (2015) focused on teamwork in teams composed from two organizations and add some specific mutual elements to their definition of teamwork. They defined team-working quality *"as a set of underlying mechanisms reflecting the task-related and social interactions between the owner's team and the contractor's team in execution a project"* (p. 1348, Suprapto et al., 2015). The task-related interactions were communication, coordination, balanced contribution, aligned effort and mutual support. The two social interactions are cohesion and affective trust. In this research the capabilities of the contractor's team and owner's team were separated, supplemented with team integration practices and joint working procedures. All factors were concluded to affect project performance. So, for improved project performance, enhanced cooperation in and between teams is required. Teams cooperate more effectively when team members have the collaborative competences, when organizational structures are integrated and when the project organization has a joint normative framework.

Literature distinguishes elements like joint working procedures and coordinating mechanisms, in general terms of *operational fit* (Bellinga, 1997; Carmeli et al., 2010; Child et al., 2005; Douma et al., 2000; Zaefarian et al., 2013). Operational fit is referring to procedures and systems to control the common organization. Both potential partners have their own procedures to ensure quality, their own methods to determine costs or profit and their own system to register time. If these systems match, the exchange of information on these topics of project control is easy. But on the other hand, the success in achieving project objectives can mask difficulties experienced in making the arrangement work at an operational level (Bresnen and Marshall, 2002). Dille and Söderlund (2011) described three specific aspects of operational fit. Their research focused on three issues in inter-institutional projects: isochronism, timing norms and temporal fit or misfit. Isochronism referred to specific rhythms and activity cycles that are the same for both organizations due to the fact that both organizations act in the same environment (or branch). The first analysis would therefore need to identify common cycles and decision points. The idea of isochronism does not facilitate a close examination of what norms and especially what norms with regard to time and timing have fundamental effects on the organization and management of the individual project. According to the researchers in project cooperation timing norms should be emphasized to understand what perception of time and timing – like organizational schedules, sequencing patterns and deadlines - the actors of both organizations have. Public organizations might be influenced by governmental entities and political decision-making cycles as well as democratic rules that would set the rate and starting point of activity cycles, which by convention or law must be obeyed. These timing norms, set by the public organization can be problematic if the common timeline is conflicting.

Since this influences the speed of activities as well as the start and finish of activities, such lack of alignment is expected to cause fundamental temporal misfits among the involved project actors (Dille and Söderlund, 2011). These misfits are hard to avoid and cannot be influenced by the project team or the project managers. But when project managers and the project team recognize the isochronism, timing norms and temporary fits or misfits in the project timeline they can optimize the planning and avoid a potential conflicting and frustrating situation. A new approach (such as the *meeting-flow approach* suggested by Chan (2012)) has to ensure an integrative and cooperative project environment for both clients and suppliers in the typical client–supplier relationship.

2.4 Public private collaboration

2.4.1 Reasons to collaborate

Cooperation between government and commercial organizations can be found in projects in different industries. The so called *public private partnership* (PPP) is often subject of study and reported in literature (De Bettignies and Ross, 2004; Flinders, 2005; Hodge and Greve, 2007; Kwak et al., 2009; Tang et al., 2010). The kind of collaborative agreements that are captured in the term Public Private Partnership differs. Most of the papers mention the collaborative form in general words like *PPP projects involve the engagement of private sector organizations in the provision of public infrastructure and services through concession contracts of up to 40 year's duration* (Smyth and Edkins, 2007). Some authors address the subject of PPP but are not explicit about the definition used (Hwang et al., 2013; Ng et al., 2013; Quiggin, 2004; Sobhiyah et al., 2009). Other researches follow a definition of governmental agencies or mention the contractual arrangements which are captured in their definition of PPP (see overview in Table 2-1). The perceptions and definitions of public private partnerships have in common that public private partnerships involve an *enduring contractual cooperation* between *one or multiple governmental and one or multiple private organizations* to accomplish an *agreed target*. Both public and private partners contribute (e.g., money, property, authority, knowledge) to the partnership, in which arrangements are made about the *allocation of risk* (e.g., financial, economic, social) *responsibilities, benefits and costs*. The central element reflected in the definitions of PPP is the sharing of decision-making authority, which contrasts with the supplier relationship in which the government decides exactly what it wants and buys it (De Bettignies and Ross, 2004; Hayford, 2006). Grimsey and Lewis (2002) state that PPPs fill a space between traditional contracting and full privatization (Grimsey and Lewis, 2002). Some definitions specify the agreed target by mentioning the purpose of delivering public infrastructure-based products and/or services (Grimsey and Lewis, 2004).

Increasing the added value in the delivery of public infrastructure and the provision of public services is the main reason for a government to investigate the possibilities for forming a partnership involving the private sector more than in traditional contracts (De Bettignies and Ross, 2004; Grimsey and Lewis, 2002; Hayford, 2006; Klijn, 2009; Klijn et al., 2008; Kwak et al., 2009; Ng et al., 2012; Sobhiyah et al., 2009; Spackman, 2002). Added value can be found in lower cost of coordination between the various components of the scope (often expressed as cost efficiency) or in the opportunity to create substantive added value (increase cost effectiveness). In general these advantages are summarized as *value for money* (VFM). PPPs are not about lowest costs, but about value for taxpayers, in the context of achieving a project's objectives. Value is a complex trade-off between cost, risk and performance and in this framework the government's exposure to risk, defined as volatility of outcomes, has to be understood (Grimsey and Lewis, 2005).

Forming a public private partnership is also about transferring risks from the public to the private sector (Akintoye and Beck, 2009; Kwak et al., 2009) or positively formulated allowing better risk allocation (Ng et al., 2012), and use the private sector's expertise in managing these risks (Hayford, 2006). Researchers and practitioners agree on these expected advantages of the collaboration and agree on the fact that these advantages are hard to fulfill. The transfer of risks comes at a price, and attempts to transfer risks which the public sector is better placed to manage than the private sector can damage the value for money proposition of a public private deal (Hayford, 2006).

Another reason for governments to consider public private partnership is to attract private financing (Akintoye and Beck, 2009; Ke et al., 2010). In developing countries this can be the only way the desired infrastructure can be accomplished on short notice (Sobhiyah et al., 2009). In developed countries the government combines non-profitable, but socially desirable project scope with profitable scope to finance the non-profitable scope (Klijn et al., 2008; Quiggin, 2004; Van Ham and Koppenjan, 2002). A less found reason is to encourage innovative solutions or to avoid the resistance against renewal (Klijn et al., 2008; Ng et al., 2012). For some countries, an additional reason is the increased accountability and transparency, and reduced corruption which is expected with the involvement of the private sector in the financing of infrastructure and services (Akintoye and Beck, 2009).

For private parties, profitability, continuity, but also prestige are important motives (Teisman and Klijn, 2002; Van Ham and Koppenjan, 2001). Participation in prestigious projects and proven experience in public private partnerships has a positive effect on the company's market position and can therefore be a motive for co-financing a part of the scope. Many authors mention the sharing of risk, but the sharing of rewards is necessary if the private sector is to

get involved voluntarily (De Bettignies and Ross, 2004). Researchers state that a desire to achieve *win-win* outcomes for both parties is necessary to encourage management styles that favor transparent, collaborative and trusting ways of working (Cox et al., 2006b). In the context of business to business relationships the *win-win* outcomes are found in the business cases that value the same aspects (revenue, profit, market share). The *win-win* situation for a public private relationship is much harder to define; there is more nuance in the balance between the *win* for public and the *win* for private. After studying the process of forming a partnership for the development of public transport infrastructure for nine projects in The Netherlands between 1999 and 2003 Van Ham and Koppenjan (2002) concluded that either the public or the private partner is searching for additional financing and reduction of risk. Reduction of risks can, next to financial risks, also be reduction of political, social or technical risks, provided that partners acknowledge the expertise of the partner in these areas and the need for this expertise to reduce risks. For a sustainable partnership public and private partners have to benefit equally on the aspects that are important for them. The balance parties found by start of the cooperation seems to be easily disturbed, given the number of failed relations (Bresnen and Marshall, 2000a; De Bettignies and Ross, 2004; Van Ham and Koppenjan, 2002). Relational tension can develop due to insufficient clarity of common interest (Bresnen and Marshall, 2000b; Leufkens and Noorderhaven, 2011; Pheng and Chuan, 2006).

Table 2-1 Various definitions of public private partnership - overview

Article	Definition
Abdel Aziz (2007)	No definition is given, the contract forms studied are: design-build, build-operate-transfer, build-transfer-operate, design-build-finance-operate, build-own-operate, design-build-operate-maintain.
De Bettignies and Ross (2004)	The term public private partnership is used in slightly different ways with the result that a precise definition to which all will agree is elusive.
Cruz and Marques (2013)	Public private partnerships are long lasting contracts, generally involving large investments, and developed in contexts of great uncertainty.
Flinders (2005)	This article adopts the Institute for Public Policy Research's (2002, p. 40) definition of a PPP as 'a risk-sharing relationship between the public and private sectors based upon a shared aspiration to bring about a desired public policy outcome.
Grimsey and Lewis (2002)	PPPs can be defined as agreements where public sector bodies enter into long-term contractual agreements with private sector entities for the construction or management of public sector infrastructure facilities by the private sector entity, or the provision of services (using infrastructure facilities) by the private sector entity to the community on behalf of a public sector entity.
Grimsey and Lewis (2005)	There is no single definition of a PPP. Depending on the country concerned, the term can cover a variety of transactions where the private sector is given the right to operate, for an extended period, a service traditionally the responsibility of the public sector alone, ranging from relatively short term management contracts (with little or no capital expenditure), through concession contracts (which may encompass the design and build of substantial capital assets along with the provision of a range of services and the financing of the entire construction and operation), to joint ventures where there is a sharing of ownership between the public and private sector.
Hodge et al. (2007)	Public private partners can loosely be defined as cooperative institutional arrangements between public and private actors.
Ke (2009)	This article adopts the Canadian Council for PPP definition: "A cooperative venture between the public and private sector, built on the expertise of each partner that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards." In general the level of private involvement ranges from simple service provisions without recourse to public facilities to service provisions based on public facility usage.
Koppenjan and Ensink (2009)	No definition is given, though they mention three forms of public private partnerships (or private sector participation as they call it). (I) Operation, maintain and service contracts, (II) Build, operate and invest or (III) joint ventures.
Kort and Klijn (2011)	Public private partnership is "more or less sustainable cooperation between public and private actors in which joint products and /or services are developed and in which risks, costs and profits are shared.
Kwak et al. (2009)	Researchers mention various definitions of PPP, explicitly the definitions of HM Treasury, the World Bank, the European Commission and the Canadian Counsel for Public Private Partnerships.
Nijkamp (2002)	In this paper researchers state that "there is no single PPP-model. Instead, examples which demonstrate their variety include: the building-claim model, the joint- venture model and the concession model" (p. 1869).
Smith and van Thiel (2002)	This article adopts the Knowledge Centre PPS definition: an organized cooperation between one or multiple governmental organizations and one or multiple private businesses to accomplish an agreed target. Although there is cooperation, partners keep their own identity and targets. Everyone contributes and arrangements are made about the allocation of risks, benefits and costs.
Spackman (2002)	The author refers to the definition of the HM Teasury (2000).
Tang et al. (2010)	PPPs are contractual relationships governing a long-term public sector acquisition and private sector provision of public works and services. PPP projects have the following common characteristics: (1) a private partner provides the design, construction, financing and operation of the infrastructure in return for payments either from the users of the infrastructure or from the public client itself; (2) public and private partners share risks and jointly manage them through better utilization of resources and improved project control; and (3) PPP projects are usually based on a long-term contract to encourage innovations and low life cycle costs.
Verweij (2015)	PPP can be defined as an enduring contractual relationship between two or more partners, of which at least one is a public body, in which both public and private partners bring some kind of resources to the partnership, and in which responsibilities and risks are shared for the purpose of delivering public infrastructure-based products and/or services.

2.4.2 Difficulties in public private partnerships

The advantages of public private partnerships are not (yet) met since these partnerships meet managerial, technical and financial problems in practice. These problems stem partially from the complexity inherent in many projects and the related increased demand for skills amongst participants (Akintoye and Beck, 2009; Van Ham and Koppenjan, 2002). For optimal result the partnership has to be formed in a competitive procurement procedure and with the right contractual condition (De Bettignies and Ross, 2004; Hayford, 2006; Sobhiyah et al., 2009). The major concern of the public partner is typically the loss of control associated with giving private providers certain contractual rights (Eversdijk and Korsten, 2015; Van Ham and Koppenjan, 2002). Firstly concerns are about the incompleteness of the contract (since the *perfect contract* does not exist). This means that when changing circumstances necessitate changes, these will have to be negotiated with the private partner and without the benefit of competition this could be costly. And secondly, concerns are that the quality of service will drop. In order to protect against such quality erosion, the partnership agreement should specify the required quality, provide for the measurement and verification of quality and provide for enforcement of the contract's requirements. Imperfect monitoring of the contract means that the private partner can cheat on quality or some other non-contractual element (De Bettignies and Ross, 2004). Though public private partnerships allow the public sector to avoid up-front capital costs and reduce public sector administration costs, local governments fear loss of knowledge in their own organization and less chances for a successful bid by the smaller local contractors (Eversdijk and Korsten, 2015). In some countries the government faces specific objections of unions to the relocation of *governmental* labor to the private sector (De Bettignies and Ross, 2004).

Different orientation toward projects

A striking difference between public and private organizations is their orientation towards projects. Organizations in which projects generate revenue and bear (most of) the costs are so called Project Based Organizations (PBO) (Ajmal and Koskinen, 2008; Arvidsson, 2009; Hobday, 2000). Organizations in which permanent structures generate revenues while projects bear the main bulk of costs are indicated as Project Oriented Organizations (POO) (Arvidsson, 2009). The reason of existence of public organizations is to serve society by preparing legislation. Governmental organizations are an executive body of legislation. At the same time, the primary task of the department responsible for infrastructure is to manage the (physical) network.

The government is a Project Oriented Organization (POO). Hence, the preparation and execution of projects is not part of the main processes; projects are meant to make changes to the network (transition) and money is spent in projects. The parent organizations of private partners (both consultants and contractors) are Project Based Organizations (PBO), while projects form the core business in which money is earned.

The balance of power between the parent organization and the project is often delicate (Troanca, 2011). Conflicts exist when expectations are mutually different or opposite and the individual cannot meet one expectation without rejecting the other (Arvidsson, 2009; Rizzo et al., 1970). Arvidsson (2009) uses the elements of time, task, team and transition in his research into tension between parent and project organization (see also Section 2.4) , which he calls projectified matrix organizations. This can lead to tension between project team and permanent organization or role conflicts for individuals concerned (Galbraith, 1971; Jones and Deckro, 1993).

Different organizational values

The cooperation between government and business partners can be difficult due to different values concerned resulting in different project strategies (Smit and Van Thiel, 2002; Teisman and Klijn, 2002; Van Ham and Koppenjan, 2002). Organizational culture as an influencing factor on the performance of organizations has been widely accepted (Bresnen and Marshall, 2000b; Cameron and Quinn, 1999; Cheung et al., 2011; Douma et al., 2000; Hofstede et al., 1997; Quinn and Rohrbaugh, 1983). For the concept of *organizational culture* many definitions are available. Sanders and Neuijen (1999) describe culture as *"the common understanding of the members - and the stakeholders of the company"* (Neuijen and Sanders, 1999). According to Hofstede (1997) organizational culture is "the collective mental programming that distinguish the members of one organization from those of another". The culture of an organization can be recognized in values and principles within an organization (loyalty of employees, economy, justice, integrity), in rituals (habits and behavioral patterns, written and unwritten rules), in important people for the organization and in symbols (logo, presentation, products). Schein (1985) defined culture accordingly: *"A pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems"* (p. 12, Schein, 1985). This definition contains elements that can be found in other literature on this topic as well: the shared values and norms that are reflected in the behavior of an organization's employees.

Compatible cultures ensure coherence between collaborating organizations and teams (Mankin et al., 2004). In public and private organizations fundamental differences in organizational values are found (Smit and Van Thiel, 2002; Van Ham and Koppenjan, 2002). These basic differences between the values of public and private organizations (Table 2-2), provide difficulties in their collaborative relationship (Bremekamp et al., 2009; Cheung et al., 2011; Smit and Van Thiel, 2002). Smit and Van Thiel (2002) formulated the values of a *business government.* The basic value of a *business government* is the public interest, combined with efficiency, effectiveness and result orientation. This business government is adaptable and has an appropriate attitude towards profit. Based on a modes research in six PPP projects, the researchers

concluded that this business government indeed favors the public interest, even at the expense of efficiency and, to a lesser extent result orientation and realization of financial profit. Van Ham and Koppenjan (2002) concluded that the differences let to different strategies for the project organization (to be designed). According to these researchers this explained why real collaborative arrangements between public private partners are difficult to achieve. Despite the collaborative intentions, a lot of attention was paid to organizing the separation between parties, both on content and on risk sharing. For example, the difference in strategy towards controlling financial risks. Controlling financial risks from the viewpoint of the public partner meant managing the political and public opinion on the balance between the costs and the expected revenue (see also(Van Thiel and Leeuw, 2002). The public strategy for the PPP was limiting the uncertainties in costs and maximizing their influence on the scope. This led to public dominance. Controlling financial risks from the viewpoint of the private partner meant preventing a negative balance between costs and revenue. To ensure the profitability, their strategy was to look for chances to maximize their scope (accompanying values: *result, innovation* and *profit*). At the same time they are aware of the political influence (stemming from *voice* and *general interest*) and public preference on *accountability* and *rules*. To avoid a negative influence of these public norms, from the private point of view the strategy was to let the public partner define the contractual scope and use proven technologies. Hence, the strategic reaction of both partners to the different value framework of the other, leads to loss of potential for enhanced public value and less collaboration then intended.

Table 2-2 Public and commercial values (Bovens, 1996, through Smith and Van Thiel, 2002)

	Government	Firm
1	Accountability	Leadership
2	General interest	Profit
3	Propriety	Efficiency
4	Legality	Effectiveness
5	Diligence	Innovation
6	Mission	Self interest
7	Rules	Results
8	Voice	Exit
9	Anticipation	Adjustment
10	Publicity	Confidentiality

In their research on collaborative contracting in business to business relationships Suprapto et al. (2015) found two elements with a strong effect on the relational attitude of participants. Next to the individual relational norms of participants, these researchers mentioned *"shared norms and commitment developed by the senior management from both the owner and the contactor, to govern their project-specific relationship"* (p. 1349). In public private partnerships

the government is supposed to behave as businesslike as possible within the boundaries formed by the norms and values relating to their duties. The competing values can lead to dilemmas for the project manager of a public private partnership, for instance in the choice between looking for support or be decisive or the choice to be flexible or persistent (Klijn et al., 2011). Research on improving the management of public private partnerships in The Netherlands supplied several points for improvement (Pleijte et al., 2006). Some improvements on managing these PPPs show the underlying conflict of values (p. 44), like *handle external procedures with some kind of flexibility* (results versus rules), *invest more in information exchange* (confidentiality versus publicity). According to Van Ham and Koppenjan (2002) intelligent process and network management and increasing trust between the actors is needed to overcome difficulties stemming from the fundamental differences in organizational values.

Over the years, several researchers developed models to measure culture from a variety of viewpoints (Cameron and Quinn, 1999; Handy, 1993; Harrison, 1972; Quinn and Rohrbaugh, 1983). In 1972 Harrison identified four types of organizational culture related to the way the organization is structured. Based on the degree of cooperation between management and operation and the spread of leverage on personal level, Harrison's model contained power, role, task and persons culture. The *task culture* had a high degree of cooperation and a high degree of spreading the leverage and was also referred to as the culture of a project organization. Other researchers considered the model of Harrison (1972) too much focused on internal dimensions and mention too little attention was paid to the interaction between organization and the external environment (Olsthoorn, 1997). In their Competing Value Framework Cameron and Quinn (1999) explicitly paid attention to internal and external orientation (one axis). Together with the degree of flexibility and freedom of action (other axis) these dimensions indicated four different sets of values indicating four different organizational cultures (Figure 2-4).

Figure 2-4 Competing Values Framework of Cameron and Quinn (1999)
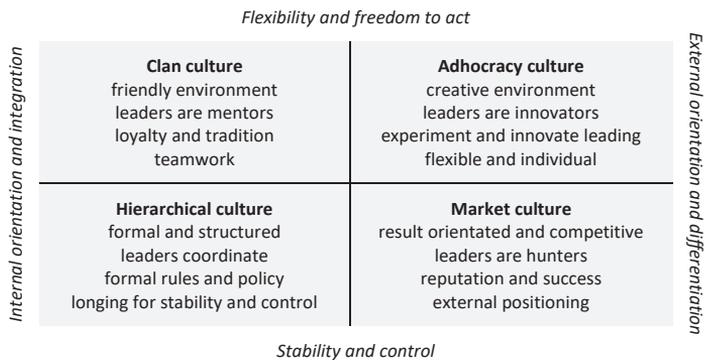
This particular research is relevant in the context of this study because of the link between organizational culture and the effectiveness of people. The researchers stated that each culture has its own elements that people in the organization appreciate and that effect an optimal contribution to the results of the organization. Effective employees in one organizational culture can lose their effective workstyle in another, less fitting culture (Cameron and Quinn, 1999). Though there is no specific favorable culture for a public private partnership (De Man and Roijakkers, 2009), the fact that the organizational culture of the parent organization is different to that of the project organization has influence on the effectiveness of people working in the project organization. In other words, effective employees in the parent organization can lose their effective work style due to a misfit with the culture of the project organization.

The organizational culture does not need to incorporate the perceptions of all employees of an organization, but may differ by department or team. Various publications indicate that an organization, especially a large organization, has a number of subcultures in addition to the corporate culture (Boonstra, 2013; Harrison, 1972). There is a connection between environmental factors and the emergence of subcultures, which for instance can be distinguished by department (commercial versus production), hierarchy (management versus operational level) or localization of work (headquarters versus local branches) (Scheltens, 1998).

Both public and private project managers of a public private partnership act on the interface of a public organization and a private organization and have to deal with the values of both organizations and the friction that can entail. As shown in Section 2.1, project management success can be measured by meeting time, budget and quality targets. This will need an efficient and effective work attitude; values that fit the private organization. As to the success of the project one can argue that when project management is executed right, the project contributes to the profits and revenue of the company, so a private project manager will be successful in the eyes of his parent organization. The project management success of the public manager will also be measured in terms of meeting time, budget and quality, but he has to manage this with regard to the propriety, legislation and diligence of the processes followed. These values can introduce a conflict with the management of the short term success criteria; meeting time, quality and budget. So the public project manager is acting in a conflicting environment due to expectations set by project management theory and expectations set by organizational values.

The influence of organizational culture on the performance is acknowledged in research on successful alliances (Bresnen and Marshall, 2000a; Luvison and De Man, 2015; Suprapto et al., 2015). To improve project performance, it is imperative to gain better understanding of the differences in organizational values of public and private organizations and the way this influences the cooperation between partners. As organizational culture is mentioned as *the*

glue that holds an organization together, the project organization should form their own project organizational culture in which *goal setting and accomplishment* is a shared factor (Cheung et al., 2011; Kort and Klijn, 2011).

2.4.3 Leadership to enhance cooperation on individual level

The difference between public and private organizational values also affects the cooperation between individuals. Cooperation on individual level interests researchers of various research fields, like psychology, anthropology, sociology, etcetera. Literature is found on personal behavior and the way this behavior affects the cooperation (Anvuur and Kumaraswamy, 2007), the element of trust and the effect of trust on the cooperative behavior of individuals (Chan, 2004) or the personal fit in cooperative relationships, with recommendations for the leadership of the manager (Cheung et al., 2011; Schein, 1985). Literature agrees on the fact that the human fit is one of the most important factors for successful cooperation. By using the term *social dilemma* Leufkens and Noorderhaven (2011) try to indicate factors that influence the willingness to cooperate. The *social dilemma* is defined as the dilemma in which parties choose between the non-cooperative strategy of pursuing their own interests and the cooperative strategy of pursuing the collective interests. The authors have tested their theory on cooperation through 39 interviews with internal and external suppliers and the client of 4 shipbuilding projects. Conflict of interests occurred not only on organizational level but also on individual level (Leufkens and Noorderhaven, 2011). Based on his interviews with people working in public and private organizations Kort (2005) concludes the images public and private employees have of each other have a potential negative effect on their cooperative behavior. Private employees think of their public partners in terms of *unreliable, lack of capacity and competence* and *no process management skills*, and the image of the private partner is captured in terms like *lack of (social) involvement, not transparent* and *only in for the profit* (Kort, 2005). So from their own perspective, project participants have a hardly positive view of the project partner's approach.

Leadership is important in creating one project culture (Boonstra, 2007; Quinn and Rohrbaugh, 1983; Schein, 1985). In their review of literature on leadership styles and project success Turner and Muller conclude that project managers have a leadership role in creating an effective working environment for the project team (Turner and Müller, 2005). In the Competitive Value Frame Quin and Rohrbaugh (1983) mention the leadership style that is effective per culture. When forming a public private partnership one should consider the type of culture that is needed to succeed and what this means for the level of autonomization (Pollitt et al., 2004). The basic strategy in any public private partnership is that the public parent organization leaves implementation of policies as much as possible to others. These others, including the department responsible for executing the decisions, create their own culture in which the typologies

of a business organization are more present than the values of the governmental organization. Pollit et al. (2004) use disaggregation to indicate the degree of structural separation between an organization and its parent organization. However, disaggregation does not necessarily mean that an organization is entirely free to make its own choices. Autonomization can be defined as the degree to which the organization has discretionary powers to make independent decisions on various matters, including the use of its financial resources, its organizational structure and project-related plans. Pollitt et al. (2004) recommend to make explicit choices regarding disaggregation and autonomization when forming a public private partnership. The autonomous positioning of the project organization contributes to the creation of a clear project culture and the creation of an effective working environment for the public private project team. Unfortunately leaders and managers are still striving for a broad consensus in organizational culture (Boonstra, 2013).

2.5 Organizations and project organizations

Several researches indicate construction projects with superlatives like *large* or *mega*, mostly referring to the budget involved (see for example:(Flyvbjerg et al., 2003a; Hertogh and Westerveld, 2010; Toor and Ogunlana, 2008; Van Marrewijk, 2005; Veenswijk et al., 2010). The organizations needed to accomplish these projects are much larger than a team and consists of several teams, up to hundreds of people. Resources are also mentioned in Turner's definition of a project: *"a temporary organization to which resources are assigned to undertake a unique, novel and transient endeavor managing the inherent uncertainty and need for integration in order to deliver beneficial objectives of change"* (p. 7, Turner and Müller, 2003).

Cox et al. (2006) also put emphasis on the temporary character of the coalition of partners in the production of each project, in contrast to manufacturing. With limited prefabrication, construction is largely a site operation, confined to the specific location where the final assembly takes place (Cox et al., 2006b). Lundin and Söderholm (1995) described four categories in which temporary and permanent organization differ: time, team, task, transition (Table 2-3). In temporary organizations time is limited, tasks are focused on the actions to be undertaken, the team is organized around these task performance and transition is always the end of the activities at the timeline. In this framework, projects are temporary organizations. As a temporary organization, the project is an agency established by a parent organization (the principal) to achieve specific objectives (Cox et al., 2006b). Project organizations differ fundamentally from traditional, functionally organized, permanent organizations. Hertogh and Westerveld (2010) showed that a project organization, responsible for the development of a large infrastructure project, can use the principles of organizational design to structure the project organization.

However, authors mentioned several distinguishing characteristics of a temporary project organization that lead to specific requirements in the organization and management of temporary project organizations. The organization of a public private project organization needs a certain degree of freedom in the scope and in the organizational arrangements to cope with environmental dynamics (Van Ham and Koppenjan, 2002). Researchers indicated several changes that can occur and influence the project organization: *"changes in external conditions, changes in viewpoints of actors and changes in actors involved"* (p. 72, Van Ham and Koppenjan, 2002).

Table 2-3 Temporary versus permanent organization (Lundin and Söderholm, 1995)

	Temporary organization	Permanent organization
	Action based approach	Decision-making approach
Time	Time is limited, time is finite from the start	Survival, time is infinite, the future is infinite
Task	Focus on action; the task itself is more important to participants in the temporary organizations than it is to members of the permanent organization	Goals: focus on decision making
Team	Teams are organized around a task and specific expectations. Multiple context: parent and temporary organization	Teams organized around a group of people. Context is the (parent) organization
Transition	Transition	Continual development, production processes

Hence, the temporary project organization of an infrastructure project has characteristics of the permanent organization and the *pure* project organization (Table 2-4). The constraints supporting the project scope require control and the long term, but not infinite character of the temporary project organization requires stability in the organization. The routine elements of the project scope are comparable with a production organization, the unique elements in the scope of the project require creativity and flexibility. The *predict and control* approach deals with these characteristics by putting more effort in the exclusion of uniqueness and stabilize the project context (Koppenjan et al., 2012). In this approach the management of a project becomes more comparable to the management of a controlled production process. In the *prepare and commit* approach the management of uncertainties is more dominant (De Bruijn and Ten Heuvelhof, 2010; Hertogh and Westerveld, 2010; Koppenjan et al., 2012). From this point of view, the management's ability to react to dynamics and *uncertainties*, stemming from interaction with various stakeholders, politics and society, is emphasized. With its focus on *uniqueness* project management knowledge (PMBoK) seemed to exclude knowledge from other relevant knowledge areas, like Human Resources, Communication and Leadership (Pinto and Winch, 2016). The specific requirements for organizing an infrastructural project need a fit for purpose organization that interacts with the parent organization. Therefore, Pinto and Winch (2016) introduced two new research approaches to enrich knowledge about the Management

of Projects, in addition to the existing internal focus on management actions to control project's processes. Firstly, more attention should be paid to the interfaces between the (infinite) parent organization and the (temporary) project organization (three domains perspective). And secondly, research on the interaction between processes in the permanent organization and the management in the project (organizational project management perspective).

Table2-4 Features of the temporary project organization (after Hertogh and Westerveld, 2010)

Feature	Production (Permanent)	Temporary project organization	'Pure' Project
Type of actions	Routing	Routine processes, unique objects	Unique
Timeframe	Infinite	Finite, bus existing over several years	Finite
Quality required	Stability and status quo	Predictable and adaptive	Flexibility and change
Personnel	Set personnel	Stable core, flexible shell	Changing personnel
Performance value	Efficiency	Efficiency and effectiveness*	Effectiveness

*project management success and product success

2.6 Summarizing the starting points for the research

Projects are widely discussed in the literature for several decades. From different branches and different scientific fields attention is being paid to the definition of project success and the factors affecting project success. Whereas project success formerly was defined by the *iron triangle* of time, budget and quality, from the beginning of this century the definition is broadened while researchers agreed on the fact that the perception of project success depends on the perspective taken. In literature the iron triangle is supplemented with other criteria that indicate the satisfaction of others with the project result, like the client-owner, users or shareholders. Literature that indicates the success criteria of a public client-owner though is rare. The definition of project success by the public client owner needs clarification for better alignment of success perception between public and private project managers acting at the interface of public project delivery organization and private project organization. This issue is further addressed in Chapter 3, 4 and 5 of this research.

Next to the definition of project success, much literature elaborates on the many different factors influencing the success of the project. Some success factors can and some cannot be influenced by practitioners in the project. Various studies show that there is a relationship between the formal aspects of a joint contribution to the project and the achieved project success, like the procurement method or the contractual characteristics (Chan et al., 2004a; Phua and Rowlinson, 2004). Most dominant success factors in literature are factors that involve both client and contractor, like teamwork, cooperation and integrated organizational structures

(Chan et al., 2004b; Pheng and Chuan, 2006; Phua and Rowlinson, 2004; Prakash Prabhakar, 2008; Suprapto et al., 2014; Van Aken, 1996; Wortmann and Kremer, 2011). These factors can be considered at organizational, team or individual level. The people of both organizations are essential in making the partnership successful. Personalities, personal backgrounds and motivations are of major influence on the achieved level of cooperation. Literature is clear on the fact that after reaching agreement for cooperation between organizations at strategic level, collaboration in and between project teams is not obvious as cooperative behavior on underlying levels can still be difficult. But, even though individual behavior is a necessary condition, this is not part of this research. For this research the inter-organizational level and inter-team level are of interest.

The cooperation between public and private partners can be facilitated and hampered by several contractual arrangements which differ in the division of responsibilities and risks between public and private partner (Abdel Aziz, 2007; Grimsey and Lewis, 2002; Koppenjan and Enserink, 2009; Tang et al., 2010; Verweij, 2015). For this research the joint accomplishment of a product is more appropriate than services. The focus is on the cooperation or collaboration between public and private partner at tactical and operational level, in which partners both keep their own identity. The main interest of this research is not the forming of a collaborative relationship, but the organization of the public and private cooperation (or collaboration), that interacts efficiently with the parent organization. This issue is further addressed in Chapter 3, Chapter 6 and Chapter 7 of this research.

There is much literature on the fundamental differences between the public organization and private organizations (Arvidsson, 2009; Smit and Van Thiel, 2002; Teisman and Klijn, 2002; Van Ham and Koppenjan, 2002). Various formats in organizational cultures show that the governmental culture differs from the culture that is desired in an effective project organization. Effective employees in the parent organization can lose their effective work style due to a misfit with the culture of the project organization. On organizational matters public and private organizations differ on the issues of decision-making structures and the mandate of the people involved. In particular the timelines and tracking processes are fundamentally different. This may even stand in the way of the strategic objectives of the project. Leadership in the project organization has to enable an effective organizational environment with organizational structures that suit the project as well as the parent organization. This issue is further addressed in Chapter 8 of this research.

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Chapter 3 Exploring the field

Abstract

In this Chapter the effect of organizational choices on the cooperation in the project teams of government and contractor are discussed from a practitioners view. The observed bottlenecks are addressed at the organizational level on which they occurred and at the organizational level that they affected. The four cases are multi-disciplinary projects in The Netherlands. These cases show that public and private organizations at strategic level embrace new cooperation forms if strategic goals can be better met. The organization of the cooperation is left to the tactical level, and at this level the challenges are severe. Misfits between responsibilities and consequences cause tension between public and private partners. Unclear ownership causes delays in decision making processes. Insufficient awareness of strategic coupling and organizational aspects ensures that the benefits of the cooperation are not met.

Subsequently four public project managers were interviewed to gain more insight in the role of the public project manager. The public project manager acts on the interface between project organization and permanent organization. From literature (Chapter 2) it is known that he has an important role in positioning the temporary project organization and creating an effective organizational culture with integrated collaboration mechanisms. The public project managers organized their project teams rather traditional, meaning that both public and private partner managed their own contribution to the project. The public project managers managed both the interface with the private partner as well as the interface with the parent organization. At the first interface the public project managers approached conflicts as a negotiating challenge and they considered this manageable. At the interface with the parent organization they seek for consensus, which is considered much more difficult and time consuming.

Finally, the public project managers were asked to indicate the success criteria for their projects. These project managers did not mention *within time and budget* as success criteria, but next to (1) the satisfaction of the quality of the project result (meets the prescribed criteria), they indicated (2) the satisfaction of users with the project results and (3) the positive contribution of the project result to the economic position of the city/region as criteria to measure the success of their projects.

3.1 Exploring the field by analysis of four cases

Since the 1990's citizens have become more assertive and desire more public participation in design decisions and more response from the government to their questions and ideas (Leroy, 1997). The government had to change into a more client and service oriented organization (Rijkswaterstaat, 2004). The change in society changed the role of the public project manager of infrastructure projects, who nowadays has a more important role in the communication with the environment of the project and managing the processes in the project, like performing risk management, scope management, et cetera (Hertogh, 2013). The private partner has taken over a large part of the traditional, more technically oriented tasks. The scope of the projects has enlarged with multiple assets, integrating multiple functions in the project. For better identification of the effects of the new roles and responsibilities and the possible resultant problems, a closer look is taken at the location in the permanent and project organization where the changes seem to cause effect. Guidance is found in the basic components that can be identified in each organization (Mintzberg, 1980):

1. The operational core: the people who do the actual work. Also called *the workfloor;*
2. Strategic top: the executive board, and in large companies not only the top but also the division management(s);
3. Supporting divisions: like HRM and facility management;
4. Techno structures: planning or quality departments;
5. Middle management: The management under the top and above the operational core.

To analyze the observed difficulties in four cases the primary organization elements are taken into account: strategic top; middle management and operational core (Mintzberg, 1979, Figure 3-1a). In public and private organizations the strategic top consists of directors who set the organizational goals; these are the decision makers of the organization. The middle management, the level right under the strategic top, has the assignment to realize the set goals and to manage the operational core. The actual work is done by the work floor; the operational core. These three levels are often referred to as strategic level, tactical level and operational level. The supporting divisions and techno structures are not taken into account in this study because these two elements are not part of the primary organization.

The levels are often symbolized in a triangle with the strategic level on top, the operational level at the bottom and the tactical level in between (Figure 3-1b). To emphasize the dependencies between these levels another form to symbolize the different organizational levels is introduced (Figure 3-1c). The strategic top outlines the framework for the other two levels, the tactical level further narrows the playing field and the operational level has to operate within this field.

Figure 3-1 Elements of an organization

(a) Mintzberg (1979)   (b)   (c) this dissertation
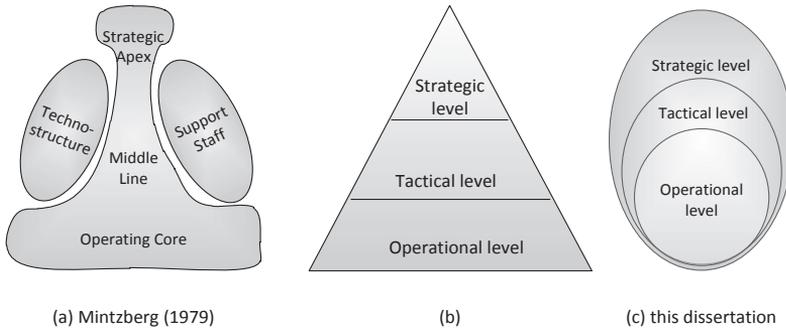
This section discusses the possible effects of certain organizational choices on cooperation in public private project teams or between government and contractor. These effects have been identified based on observations in the field (attending meetings, discussions with participants, analyzing project documentation). The four cases mentioned here are multidisciplinary projects and aimed at creating new infrastructure, new recreation area, new homes and new commercial units respectively. The project scopes have common elements, but they also differ on several others. The observations can indicate room for improvement in cooperation. The new schematic representation in which the organizational levels are considered is used to address the observed bottlenecks (Figure 3-2). In this model the organizational level on which the bottleneck occurred can be appointed and is aimed at the organizational level that they affected.

Figure 3-2 Cooperation of public and private organization in a project organization
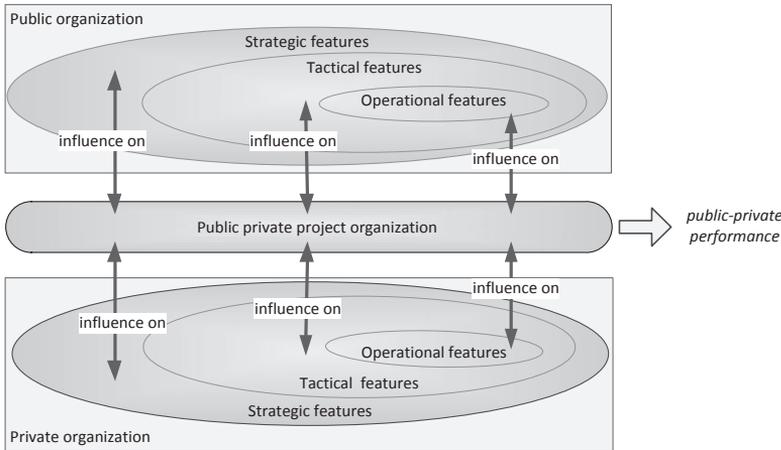
3.1.1 Case I: City expansion

The first case is the development of a new city area. The project includes the creation of six artificial islands to build 18.000 houses for 45.000 residents. The development is divided in several stages. The project management agency of the city is since 1992 responsible for plan preparation and management. The creation of the artificial islands is a huge investment in a very early stage. The return on investment will only come after new houses have been built on the islands and are sold many years later. In a very early phase the city government selected 15 real estate developers, housing agencies and contractors, gathered in five consortia, to share the financial risks and to commit to the plan in an early stage of the project. This way the municipality had secured that the islands they created would actually be built on. In 1996 a Public Private Partnership was formed to develop and build parts of the plan (Intentieovereenkomst 1996, Samenwerkingsovereenkomst 1998). Part of the PPP agreement was an article in which parties agreed that the consortia would develop the public space (infrastructure) and facilities (supermarket, school, childcare). Usually this is the responsibility of the municipality. After a few years (2001) the consortia returned the responsibility for realization of the public space and facilities. The realization was a too big logistic and coordination issue for the consortia. They did not have the knowledge, authority or focus to do this. Because of the number of partners and the big differences between them the organization of their common tasks proved to be too difficult. Partners (or actually all 15 partners and the city government) returned to a traditional relationship in which the consortia only developed houses. A financial transaction was agreed upon with the change of tasks, so that the funding of the extra work was covered. In 2011 almost 15.500 people were living on the first two islands.

The cooperation between partners in this project went well on aspects arranged by the traditional roles and responsibilities. Both partners took care of their part of the deal; little coordination was required on the corporate issues. On the areas were partners had agreed to the transition of responsibilities from government to commercial partners the partnership failed, caused by:
- lack of incentives for the commercial partners and being kept to their 'natural' responsibilities by the governmental partners (civilians will complain at the governmental office);
- unclear problem owner (diffuse) due to the large number of commercial partners joint in the partnership;
- inexperience of the commercial partners to organize the process in the traditional way and incompetence of the governmental partners and stakeholders to work in another than the traditional way.

In this case the most important driver for the public private partnership was the sharing of risks in the initial phases of the project. The transition of responsibilities was arranged on tactical

level. There seems to be a misfit in the responsibilities and the strategic features of the private organizations. The success or failure in these matters were organized on tactical level of the private organization but had a strong connection with the success of the project on strategic level of the public organization (Figure 3-3). The actions on tactical level in the private organization were not connected to results expected by the strategic level in the own organization. The lack of interest in a successful realization of these matters by the strategic level of the private organization introduced a conflict in this case; because there was much interest in a successful realization of these matters in the public organization on both tactical as well as strategic level.

Figure 3-3 Conflicting patterns in Case I

3.1.2 Case II: Creation of new landscape

The main purpose of the development of the project in the second case is to add new economic activity to the area. The project includes the realization of a lake to facilitate recreational functions with beaches and a harbor, about 2.000 new houses, extra water safety area and new nature. The local governmental organizations supported the goals of the regional project. In order to achieve the goals the government turned to the market. As in the first case the government selected a partner in an early stage to share the risk for the development and to develop an achievable business case.

In 2003 the state (province) started a competition in which five consortia made a design and a matching achievable business case. The winning team was a consortium of a real estate developer and dredging company. By winning the competition the consortium had earned the right to negotiate with the state to form a PPP for the realization of their plan involved. In 2005 they reached a first agreement (Intentieovereenkomst) and in March 2008 the business case was accepted by the councils of the province and both involved municipalities. After several years (and a lot of costs: EUR 29 million to buy land and EUR 6,5 million for the preparation team) the economic and political climate had changed. The plan was withdrawn.

Three main problems in this project occurred in different cooperative relationships. In the context of this research the following aspects are highlighted (Figure 3-4):

1. the troublesome relationship between the governmental and the commercial project team due the negative view on each other;
2. the troublesome relationship between the project team and the municipalities involved in the project due to unbalanced representation of governmental partners in the project team;
3. the under estimation by the government of the resistance against the project influenced the relationship with the commercial partner.

Figure 3-4 Troublesome issues in Case II
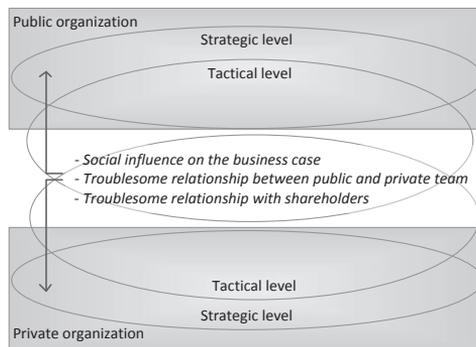
Ad 1] As this was a major project for the government and the cooperation form was new to them, the governmental team focused on the interaction with the commercial partner. This was the period right after the construction fraud affair. So the governmental organization selected their best man to deal with the commercial managers. The project manager did not seem to have faith in the reliability of the commercial partner. This supposed lack of reliability reflected on the commercial partners. The commercial managers saw in the behavior of the public manager and public team their bias of incompetence of the government confirmed.

Ad 2] The management team of the public partners consisted only of employees of the province. They were positioned in a special team – outside the provincial organization. The other public partners, the two involved municipalities and the Water Board, were represented by the management team. The plan had to be supported by four different governmental partners and the conditions for the project had to be set by these different governments in different decision making processes. Due to unbalanced representation in the governmental project team there seemed to be insufficient understanding of the various interests. The governmental organizations failed to reflect their different governmental interests in the project team.

Ad 3] The opponents of the project had good connections with local politicians. The project team of the government seemed to have underestimated their influence. The strategy that the governmental team developed to deal with opponents and to mobilize the positive stakeholders was not fully agreed on by the commercial partner. Differences in ideas for the strategy reflected on the cooperative behavior of the commercial partner.

To execute this project the government needed a commercial partner for knowledge of an achievable business case and to share the risks of the project. The commercial partner needed the government to set the environmental conditions by several governmental (legal) procedures (zoning plan, regional plan). These environmental conditions are required to realize the elements of the business case (houses, water, roads). The procedures are typical public processes. Only with the right conditions the commercial partners could develop houses, roads, et cetera.

As stated before the connection between the governmental team and the governmental organizations was limited (ad 2). Due to political forces in the governmental organizations the plan supporting the business case had to be changed several times and on several issues. Business partners had little understanding for this. The early involvement of the commercial partner was of additional negative influence to the political acceptance of the plan. Politicians were very wary on excessive profits for the commercial partner and suspicious about the accuracy of all financial products that were presented by the project team.

Eventually the acceptance of the conditions supporting the business case by the local governments was the main problem of the project. The risks in the business case could only be managed properly with a matching influence on the environmental conditions. The fact that the supporting conditions could not be matched with the business case had to do with the troublesome relation between public and private partners (ad 1.) and the limited support for the governmental team (ad 2.). The sad part is that this public private partnership was initiated especially to get narrow connections between business case and environmental conditions. The fragile strategic balance accomplished on strategic level at the start of the cooperation, seems to be insufficiently secured on the tactical level (Figure 3-3). Actions on tactical level of the common organization were not framed by a common vision on the expected results on strategic level in both parent organizations. The view on a successful realization of these matters was different on the strategic level; differences in the organizations occurred in for instance the process to be followed, the responsibilities of the organization in the process and the timeline of the actions.

3.1.3 Case III: Urban development

In the third case the municipality aimed for a major change of the city center in the area around the railway track. Historically an industrial zone was situated along the railway. Over time, these locations did no longer fit the requirements of the factories. So when the production activities where moved, from 2005 the municipality made plans for redeveloping the sites into urban areas. The plans contained housing developments. A partnership between owners of land (companies), real estate developers and the municipality was formed to connect the plans and the conditions that had to be set by the government with the business case of the real estate developers.

The governmental role in this case was very different from the governmental role in the second case. After reaching an agreement the government set the legal conditions for the use of the areas involved (their part of the deal). But commercial partners did not develop as expected. Due to the changed economic climate the private partners had difficulties to develop a closed business case fitting the conditions set by the government. The cooperation between partners in this project was started in a positive economic climate. Commercial partners agreed with the city government to set high ambitions for the new city area. After setting the conditions the city lost their influence on the results of the cooperation. But they did not lose their natural responsibility in providing housing and ensuring a secure environment.

Figure 3-5 Insufficient fit in Case III

The cooperation in this case was not as close as suggested in the external communication. Partners operated with their own team and within their own organization. The project managers of both organizations met occasionally to discuss the interfaces. As seen in the second case a very close cooperation could have difficulties but in this case one can conclude that a too loose form is not working either. The procedures involved with the zoning plan took some time and the business case had changed over time because of changing economic climate. Due to the loose coupling of both project teams the interaction between the business case and environmental conditions was insufficient. The united strategic goals were not met

because of insufficient clarity in the interdependencies of the organizational parts (Figure 3-5). The common vision on strategic level was not well enough captured in the actions on tactical level in both organizations.

3.1.4 Case IV: Spatial reorganization in inner city

The fourth case is a combined railway, urban development and real estate project. The railway tracks between two adjacent cities were to be extended and instead of above-ground as the tracks originally lied, the new tracks will be built in a tunnel. This created space on street level for a new urban development. The project contains the realization of two underground tunnels, underground parking, a new municipal office, new homes, offices and a park. The first ideas for this project were expressed in 1988. It lasted till 2005 before the Dutch parliament supported the plans and made (sufficient) budget reservations and a governmental agreement was signed. Next to the city municipality and the Ministry several other governments are financing the plan. The municipality has founded a special developing company to manage their part of the contract. The Ministry of Infrastructure and Environment has delegated their responsibilities to the national railway company. The investment for the tunnel project is estimated at 355 million euro.

The design and build contract contains the development of the tunnel with a new railway station underground which is the primary responsibility of the national railway company and the urban area at ground level which is the responsibility of the municipality. In 2008 a combination of constructors was selected to design and build the tunnel and part of the new road plans. The lead for the contact is the national railway company, since with their share of the design and construct contract the largest amount of money is involved.

The governmental organization that manages the design and construct contract is formed by people of the national railway company. These people should also monitor the municipal interest in the contract. The primary concern of the project organization of the municipality is to build the new city hall on top of the new railway tunnels. The people of this organization also acted on behalf of the municipality on issues in the design and construct contract of the national railway company. Due to this complex internal organization the people of the parent organization seemed to get disconnected from the project and the project goals. For instance the necessary permits accompanying the designs by the contractor were rejected by the municipalities. But the designs were within the contract requirements and therefore accepted by the project organization. In this case the complex organization of cooperation on the tactical level between public partners is affecting the relation with the private partner (Figure 3-6).

Figure 3-6 Absence of organizational fit in Case IV

3.1.5 Cross case findings

These very different projects are alike in some aspects. In all cases there seems to be a different approach or different internal processes for reaching the public goals and the commercial goals.These differences in internal processes and organizational culture caused miscommunication with shareholders or stakeholders. Traditionally the governmental partner knows how to deal with other departments or other governmental organizations. By transferring responsibilities to commercial partners the public private cooperation has also to be adopted by several governmental departments linked to the project.

Due to disagreements on choices mostly concerning the iron triangle - time, quality, budget - the organization was not working optimally. Conflicts were for instance caused by:

- misfit between responsibilities in the project organization and consequences on strategic level in the parent organization (all cases). Civilians will complain at the governmental office; this incentive cannot be transferred to the commercial partner; - unclear problem owner due to the large number of governmental (Case II, IV) and/or commercial partners (Case I) joint in the partnership;
- Insufficient awareness of strategic coupling of organizational elements. The business case was not (really) a product of both partners. The second and third case showed that the coupling of zoning plan and business case did not fit the governmental decision-making for the zoning plan nor the commercial decision-making process for the business case;
- The agreement for cooperation was signed at strategic level. Cooperative behavior on underlying level appeared to be difficult (Case II, III, IV). The difficulties in cooperative behavior can be noticed in for instance late information exchange, discussion instead of decision making and finally change of initial agreements.

Figure 3-7 Difficulties in cooperation observed in the cases

Public organization(s)

Strategic level

Tactical level

Operational level

- Different approach or different internal processes
- Disagreement caused by misfit between responsibilities in the project and consequences in the parent organization
- Long lasting discussions in stead of decisions caused by unclear problem owner
- Insufficient awareness of strategic coupling on tactical level
- Cooperative behavior on operational level appeared to be difficult

Organization of the project

Tactical level

Attention for differences between parent organizations and clear choices for the tactical framework of the project organization.

Operational level

Tactical level

Strategic level

Private organization(s)

So difficulties occur in the cooperation between public and private partners. To create public value both partners are required. The cases show difficulties in the governmental and in the commercial role in new cooperation forms. On strategic level public and private organizations seem to agree on the need to cooperate and new cooperation forms are embraced if strategic goals can be better met. The organization of the cooperation is left to the tactical level. On this level the new roles and responsibilities manifest most clearly. It seems that the challenge to fill in the new (social) responsibilities and the challenge to share responsibilities in a new way both can be addressed at the tactical level. The fit between tactical level and strategic level in the parent organization seems to be clear, but the fit between tactical level in the project organization and the strategic level in both parent organizations is less clear (Figure 3-7). These observations indicate room for improvement on tactical level.

In all cases the initiative to cooperate came from the government. They selected the project and the partners. For more clarity on the government's expectations of the collaborative arrangement four governmental managers were interviewed about the notion of success in their (new) role.

3.2 Four exploratory interviews

For a more specific view on the problem of cooperation in public projects four interviews with governmental project managers in the construction industry in The Netherlands were held. These project managers were not connected to the cases described in Section 3.1. Interviewees were selected on their many years of experience. In addition, diversity in the organization in which they operated was sought. The interviewees worked at local (a small and a large

municipality), regional and national level. The interviews were semi-structured, based on a short questionnaire (Appendix I). The purpose of the interviews was to look further into the factors affecting a cooperative relation and the success that was accomplished.

3.2.1 Interviewees

All interviewees were governmental project managers, had more than 20 years of experience and spent almost all of their working life working for public services. The projects the project managers were interviewed about all had a lead time of over 10 years. Project managers were not always in charge of the whole process. Only one project was completed, the other projects had completed parts while other parts still had to be developed.

3.2.2 Reasons to cooperate

The interviewees were asked for the reasons to cooperate. The main reason to cooperate with a partner has to do with the financing of the project. That is to get access to corporate finance (four expected and achieved) or to share financial risks (two expected and achieved). Logically all contracts contained financial agreements, but none of them financial penalties.

All project managers had to cooperate on an operational level with private parties. On two of the projects the public partners had formed a joint identity. In these projects the cooperation was established by a procurement procedure. In the other two projects the cooperation was a result of possession of land and houses in the project area. In all projects the initiative to cooperate was coming from the public site. The types of contract applied to formalize the cooperation were custom made in all projects (thus different in all projects).

The following aspects were for some of the interviewed project managers reason to cooperate with 'a' partner:
- flexibility with respect to scope (2 expected and achieved, one not expected but turned out to be necessary);
- better quality of the project result (2 expected and 1 achieved);
- effectiveness of organizing the project (2 expected and 0 achieved).

None of the interviewed managers had expectations of the partner considering knowledge of the execution phase, or at least, it was not a distinguishing feature between the potential partners. As mentioned before the reason to cooperate with this specific partner had to do with ownership of land and houses or was a result of a procurement process. Flexibility, transparency and commitment are considered important indications of the quality of cooperation, but not a reason for choosing a partner to cooperate with.

3.2.3 Challenges on tactical level

Questions were also asked about the organizational level of the cooperation. In all projects the public as well as the private organization had their own project team; the cooperation seems to be rather traditional, meaning that both public and private partner managed their own contribution to the project. The teams met at management level and less frequent on director / senior management level. The managers on organizational level balanced between solving problems and keeping a constructive cooperative attitude between partners. The director / senior management level was mostly used to solve problems that could not be solved at the management level without losing the constructive team spirit. Conflicting interests were raised to the strategic level to weigh into the broader context of the cooperation. To reach the goals on management level the public managers applied a more constructive approach. Conflict situations in the cooperative relation with the external partner were approached as a negotiating challenge.

When asked about problems in their projects regarding cooperation the managers surprisingly mentioned internal problems as more difficult to deal with than problems with the external partner. Problems due to the lack of cooperative behavior from other departments of their own organization, difficulties in cooperation with shareholders or other governmental organizations (more or less represented by the governmental project manager). This occurred also the other way around. Project managers had experienced that the project manager of the partner had difficulties is his own organization. Especially when the *own organization* was a consortium of multiple companies cooperating for this particular project. One of the managers mentioned the lack of a common identity for the project team as part of the success. Because the cooperation with the project partners was a loose coupling, the people in his own organization still considered him a colleague. The manager felt like he could easier influence certain prior conditions based on the organizational standards in favor of the project outcomes.

3.2.4 Success of the projects

Interviewees were also asked to pick five success criteria out of 20 to describe the success of the project they were interviewed on. Most mentioned criteria are the satisfaction of users with the project results, the positive contribution of the project result to the economic position of the city/region and the satisfaction of the quality of the project result (meets the prescribed criteria).

The interviews indicate that criteria other than the in project management most mentioned "golden triangle" - time, money and quality – are important for governmental managers. Based on these four interviews, other criteria are of influence on the actions of the governmental manager. The governmental project manager seems to be aiming for satisfaction with the result, as a solution to the problem. This is remarkable because the managers were working in the

design phase where the influence on the "solution" is only limited. Basic choices in matching the solution to the project are made in the specification / pre-project phase. The project assignments of the project managers are the political answers to the (social) problems. The managers had to implement that. Also, the governmental project manager seems to be aiming for the satisfaction with the project management process. The interviews indicate that governmental managers strive to maximize support of their (internal) clients, even if this means failure on the criteria *in time* and *within budget*.

3.3 Summarizing the starting points for the research

3.3.1 Public project success

Current practices in collaborative arrangements are observed in four different cases concerning infrastructural developments. The collaboration in the cases involved different public and different private parties. The multiple organizations involved contribute to the complexity of the collaboration (consistent with(Mankin et al., 2004). The difficulties reported in translating agreement reached into sustaining cooperative practice, as found in the literature (Anvuur et al., 2012; Bresnen and Marshall, 2000) , were also witnessed in these cases. The observed difficulties contained insufficient awareness of the strategic coupling on tactical level. Strategic misfit between responsibilities in the project organization and consequences in the parent organization caused disagreement between partners at tactical level. Unclear responsibilities and ownership was another source of long lasting discussions between partners. Shifting public responsibilities to the private partner in the organization of the project caused unexpected difficulties in the approach of formerly internal processes, now owned by private partners who were unfamiliar with the people and organizational norms. Finally, cooperative behavior on operational level appeared to be difficult. As the literature already indicated, effective behavior in the culture of the parent is not per definition the way to behave in the public private project organization (Cameron and Quinn, 1999). As teamwork-quality in the public and in the private project team, as well as between the teams is essential for project performance (Suprapto, 2016), the observations in the cases clearly indicate room for improvement.

The interviews on tactical level in the public project organization show the project managers' main concerns. The public project managers perceive internal problems more difficult to deal with than problems with the external partner. In their attempts to satisfy internal stakeholders, less attention is paid to keeping the project within the *iron triangle* constraints (on time, within budget, meeting quality constrains). They are constantly balancing between solving project problems and keeping a constructive cooperative attitude

between internal and external partners. From literature it is clear how the private project manager defines success, but what project success is to the public project manager is unknown. To better understand the managerial actions of the public project manager, more insight is necessary into what he is striving for. Further research on the success perception of the public project manager is a valuable step towards enhanced project performance in infrastructure projects.

3.3.2 The combined project organization

Based on the findings from literature (Chapter 2) and current practices (Chapter 3) the project organization is considered a temporary organization, which is in line with the definition of Turner (Turner and Müller, 2003). After the procurement phase, the public and private project organization form a combined project organization (Figure 3-2). Strengthened by the findings of the exploratory interviews with four public project managers, the temporary organization is positioned outside the parent organization (Figure 3-8). The characteristics of such an organization are in between permanent production organizations and 'pure' project organizations (Hertogh and Westerveld, 2010). The characteristics of this temporary combined project organization are not addressed in current literature, though this idea of positioning the project organization is upcoming (Anvuur et al., 2012). The purpose of the temporary organization is to create new (or at least renewed) infrastructure. Nevertheless the management literature emphasizes mostly on controlling the processes and activities in the project organization and not on the purpose.

The public project managers manage both the interface with the private partner as well as the interface with the parent organization (Figure 3-8b). At the first interface the public project managers approach conflicts as a negotiating challenge and they consider this manageable. At the interface with the parent organization they seek for consensus, which is considered much more difficult and time consuming. Further research on the relationship between public project organization and the parent organization is a second focus of this research toward enhanced project performance in infrastructure projects.

Figure 3-8 Forming the Combined Project Organization

a. Interaction between public and private organization up to and including the procurement phase

Public organization		Private organization	
Public parent organization (client-owner) ⟷	Public project delivery organization	⟷ Private project organization ⟷	Private parent organization

b. Public and private partners form the CPO after procurement

	Combined project organization		
Public parent organization (client-owner) ⟷	Public project delivery organization ⟷	Private project organization ⟷	Private parent organization

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Chapter 4 Dutch Public perspectives on project success

Abstract

Purpose – We argue that public project managers do not consider the iron triangle (cost, quality and schedule) primary important in measuring the success of their projects. To investigate which success criteria are important to public project managers, we interviewed 26 Dutch project managers who are employed by the government and who are responsible for managing infrastructural projects.

Design/methodology/approach - In this research the Q-methodology is applied. Q- methodology helps to find correlations between subjects across a sample of variables. Q-factor analysis reduces the individual viewpoints down to a few factors. A factor can be seen as the mathematical representation of an 'average' perspective shared by a group of people. Findings - Based on the individual rankings of 19 success criteria we distinguished three common perspectives: the holistic and cooperative leader, the socially engaged, ambiguous manager and the executor of a top-down assignment. In none of the perspectives the iron triangle criteria formed the top three to measure project success.

Research limitations - The research results may have a national character. The way project success is perceived by public project managers may be culture dependent. For this we expand the research to other countries in the near future.

Practical implications - This paper contributes to the understanding of the public project manager by their private collaboration partners, like consultants, engineers and contractors. This will help them to understand their client and contribute to better collaboration in projects. Originality/value - This paper shows that the difference in work attitude and value frame in the public sector leads to a specific view on project success.

4.1 Introduction

Large infrastructural projects in The Netherlands are initiated by governmental organizations. Since the beginning of the 21st century Design and Construct contracts are put up for tender. In the design and construction process after a successful bid the public party (government) and the private party (contractor) closely work together. Both parties aim at achieving project success. Both the determination and the achievement of project success is a widely discussed subject the in literature (Atkinson, 1999; Belassi and Tukel, 1996; Chou et al., 2013; Parfitt and Sanvido, 1993; Pinto and Slevin, 1988; Toor and Ogunlana, 2010; Wit, 1988). A distinction is made between success criteria, the set of standards by which the measurement of success occurs (Baccarini and Collins, 2004; Cooke-Davis, 2002), and success factors, those aspects that directly or indirectly influence project success (Chan et al., 2004b; Chou et al., 2013; Kog and Loh, 2011; Mir and Pinnington, 2014; Parfitt and Sanvido, 1993; Tabish and Jha, 2012).

In this research success criteria are studied. Currently much of the literature relates to project success and how to obtain it. A number of studies have tried to gain insight in understanding the key success criteria used by different parties (Bryde and Robinson, 2005b; Davis, 2014; Frodell et al., 2008; Lim and Mohamed, 1999b; Rashvand and Zaimi Abd Majid, 2014; Turner, 2007), but these studies only relate to the public sector in a very limited way. The role of the client in (construction) projects has also been thoroughly discussed in literature. Generally the contribution of the client as a success factor in achieving project success is discussed and, if defined, measured by the iron triangle (Chan et al., 2001; Hwang and Lim, 2012; Sanvido et al., 1992; Thompson, 1991). Articles that consider the relationship between the client and the project manager tend to focus on the behavior of the private project manager towards the client (English et al., 2009a; Klimoski and Webber, 2004), discuss the importance of cooperation between client and project manager (Chan et al., 2006; Phua and Rowlinson, 2004), or concentrate on the exchange of information between client and project manager (Chen, 2011; Müller and Turner, 2004). Those articles that relate to the perspective of the client focus mainly on the perspective of the client of a private organization (McLeod et al., 2012; Shenhar et al., 2001; Thompson, 1991).

So far, researchers have considered the public client in a passive contribution to project success. We argue that public project managers have to be considered in an active role with respect to project success. Governmental organization(s) appoint a project manager responsible for the project. The public project manager is head of the governmental Project Delivery Organization (PDO) and from the public point of view this person is the project manager (Hertogh et al., 2008a). However from the contractor's point of view, the manager of the PDO is the client. Though the client is often mentioned as an important factor in achieving project success

(Bresnen and Marshall, 2000a; Davis, 2014; Phua and Rowlinson, 2004; Shenhar et al., 2001; Thompson, 1991), most studies consider the client an external factor. From the viewpoint of the governmental organization the contractor's client – the manager of the PDO - is considered a part of the project organization. Therefor the *pubic project manager* has to be considered in an active role in achieving success.

Most of the literature focusing on project success criteria concentrates on the criteria that are important for the project manager of the executing party (Cooke-Davis, 2002; Munns and Bjeirmi, 1996; Pinto and Slevin, 1988; Wit, 1988). Literature concerning the public project manager's point of view on project success is lacking. This is especially notable since the literature seems to agree on one thing: whether a project is considered a success or a failure depends on the perspective taken to judge it. This perspective is formed by the criteria used to measure the success. How the *public project manager* determines the success of his project is not clearly discussed.

The lack of knowledge on public sector success criteria is related to the fact that most articles take an external view of the client: the role of the client is considered from the standpoint of others. A number of articles relating to public sector success criteria focus on the different success perspectives between the private and public sector. These studies have noted the lack of determinants of success in public parties as opposed to private organizations (Allison, 1984; Rainey et al., 1976), but this observation has not led to the identification of new *public sector criteria*. More recently it has been observed that public sector parties tend to focus more on the determination and evaluation of their projects. To accomplish this they started copying the private sector's success indicators, even though these might be unsuitable for public parties since public party's success criteria should reflect the goals of public organizations, *"quality and reliability rather than 'hard' product attributes. Public [projects] are not only about efficiency and effectiveness, but also about justice, fairness, equity and accountability"* (p. 277, Van Thiel and Leeuw, 2002). This makes public parties fundamentally different from private organizations (Kort, 2005; Perry and Rainey, 1988; Thiel and Leeuw, 2002). Public sector success criteria should reflect these characteristics and mirror the political process from which they descent. However, what these success criteria should be, or how they play a role in the public organization is not covered.

This research focuses on what public project managers who are actively involved in the project, consider to be project success. The research is performed in The Netherlands and contributes to the understanding of the success criteria used by the project managers in the public sector. Based on a literature study 19 possible success criteria were selected and presented to 26 public project managers. By using Q-methodology we were able to distinguish

three ways in which public project managers assess project success. The understanding of the public perspective on project success is essential for private companies, consultants or contractors as it may lead to successful bids and compassionate collaboration with the PDO.

4.2 Public success criteria

In the early years of project management it was said that projects were successful if they were delivered on time, within budget and satisfied the set quality measures. These three measures of success are also known as the iron triangle of time, cost and quality (Atkinson, 1999; Jha, 2011; Lim and Mohamed, 1999b; Morris et al., 2010), the triple constraint (Conchúir, 2011; Mantel and Meredith, 2009), or more positively, the golden triangle (Westerveld, 2003). De Wit already postulated that these three indicators by themselves are not sufficient to determine whether or not a project is a success (Wit, 1986, 1988). To adequately determine whether or not a project is a success it is proposed that more indicators are necessary, even though these might be contradictory (Atkinson, 1999; Chou et al., 2013; Jugdev and Müller, 2005; Shenhar and Wideman, 1996; Westerveld, 2003). This contradiction in the range of possible indicators is always possible because the judgment on whether or not a project is a success depends on the perspective taken.

In determining success a distinction is made between project success and project management success. Considering the entire life cycle of a project, from initiation to the final close down project management focuses on the planning and execution, while project success also considers the utilization, handover and close down (Munns and Bjeirmi, 1996). Typically a contractor is responsible for this project management scope, as opposed to a public project manager who will be confronted with the entire life cycle of a project, including the utilization (operational phase). To judge either project or project management success a distinction should be made between the criteria used to assess them. Project management success is part of the project success (Al-Tmeemy et al., 2011; Munns and Bjeirmi, 1996; Pheng and Chuan, 2006) and can be mainly assessed by the iron triangle. The contractor's responsibility is to deliver a finished product as set out in the contract within the given constraints of time and budget. Since the rise of integrated contracts, the scope of the contractor is at times expanded to include design and/or maintenance aspects. Here the contractor is involved in the earlier phases, as well as a part of the operational phase. The client considers a broader scope and life cycle of the project than the contractor and determines the success by a larger number of criteria (Bryde and Robinson, 2005b; Sanvido et al., 1992). But that is not to say that commercial contractors determine their project success solely by the iron triangle. Project management authors focusing on the private sector have noted that for the commercial project manager

also other criteria are involved: safety, quality control / rework, the effect the project has on the contracting organization, among others (Bassioni et al., 2004; Cox et al., 2003; Mantel and Meredith, 2009; Winch, 2010). A certain interchange of criteria seems to have taken place over the last few years. Public parties are increasingly focused on ways to assess their performance and use the criteria which private parties already handle. Therefore this study concentrates on public organizations and the way they are different from their private counterparts.

4.3 Method of research: Q-methodology as a method of studying subjectivity

In this research the Q-methodology, a method of impression, is used to investigate the inherent structure of the collection of success criteria from the perspective of the public project manager. Q-methodology was developed in social research and is used to measure peoples' "viewpoint". It provides a foundation for the systematic study of subjectivity (p. 93, Brown 1993). The Q- sort, which is the main tool of Q-methodology and which will be explained later in this paper, is performed differently by different people. Since there is no right or wrong in subjectivity this is not a problem. Q-methodology looks for correlations between subjects across a sample of variables. Q-factor analysis reduces the many individual viewpoints of the subjects down to a few factors. A factor can be seen as the mathematical representation of an 'average' perspective shared by a group of people; this shared perspective represents the shared way of thinking among the members of this group. Q-methodology is considered suitable for our research because we know that subjectivity is a factor in judging the success of projects. The goal is to find out whether some overall views on project success exist, shared by groups of respondents.

To achieve the objective of modeling subjective viewpoints, the participants were asked to systematically rank success criteria (Q-sample), which were prepared by the researcher. This was done in a face-to-face interview setting. The given Q-sample is the subset of criteria considered relevant, taken from a review relating to all possible criteria used to judge project success in the construction industry. The ranking occurred by means of a ranking sheet; in this case the ranking sheet ranges from -3 (least important in determining project success) to +3 (most important in determining project success). The criteria, printed on separate cards, and the ranking sheet were provided. Project managers were asked to rank the criteria in relation to each other from their point of view using the ranking sheet (Figure 4-1). By asking the public project managers to rank the success criteria, the prioritization of these criteria is shown. The format of the ranking sheet forces the respondent to choose between criteria and indicate which they consider the most significant. If we had asked the project managers which crite-

ria are important to measure the success of their project (method of expression), they would probably have named multiple criteria. A public project manager could, for example, state that eight different criteria play a role in determining his project success. However, when leading a project, project managers have to make choices that affect the extent to which future results will meet the criteria. In every project the project manager is confronted with unexpected changes, alterations, or problems, which means he has to choose one of the different alternatives on how to proceed with the project. Before making these choices he implicitly makes a trade-off between the different criteria. Every alternative means a trade-off: one alternative may cost extra money, but ensures that the project is finished on time; the other alternative may take longer, but be safer for the workers. It is exactly the priority within the applicable criteria that is important in determining how the project manager leads the project. The trade-off means that one criterion has priority over another and this is exactly what the Q- sort will demonstrate. The ranking will show the real subjectivity (Brown, 1993).

Figure 4-1 Ranking sheet used in this research

least important in determining project success   most important in determining project success

-3	-2	-1	0	+1	+2	+3
criterion	criterion	criterion	criterion	criterion	criterion	criterion
	criterion	criterion	criterion	criterion	criterion	criterion
		criterion	criterion	criterion		
		criterion	criterion	criterion		
			criterion			

The Q-methodology consists of a quantitative and a qualitative part. The quantitative part leads to the identification of common perspectives within subgroups of the respondents. When people have a similar view on certain important and less important criteria, there will be a high correlation between the Q-sorts (perspectives) of these people. The Q-sorts of the people in this group will correlate less with the Q-sorts of people who do not belong to this group. For each individual Q-sort the correlation with all other Q-sorts is calculated. For analyzing the data in this research a software program called PQMethod (version 2.32, September 2012) is used. The correlation matrix is factor analyzed, which is the statistical grouping of the perspectives – a factor is the average perspective formed by a group of respondents' perspectives.

To determine which Q-sorts load significantly on a factor, the statistical significance of the loading of a Q-sort is determined by calculating the standard error (SE) (Brown, 1980):
- Factor loadings that exceed the +/- 2.58*(SE) are statistically significant at the 0.01 level;
- Factor loadings that exceed the +/- 1.96*(SE) are statistically significant at the 0.05 level.
  The standard error can be calculated by means of Equation 4-1.

Equation 4-1 Standard Error

$$SE = \frac{1}{\sqrt{N}}$$

SE = standard error
N = number of items in the Q-sample

With the significantly loaded Q-sorts the factor scores of specific criteria are calculated: the z-score of that item in the Q-sample. *"Before merging the separate Q sorts, however, it is necessary to assign a factor weight to each as a reflection of the fact that some Q sorts are closer approximations to a factor than other Q sorts. The expression for calculating factor weights is given by Spearman (1927): wij = fij / (1 - fij2), where fij is the factor loading of the i- th individual on the j-th factor, and wij is the weight"* (p. 240, Brown, 1980). With this weight a weight-score can be calculated for all items in each Q-sort that is loading on the factor, which is calculated with individual scores given to these items in the separate Q-sorts determining the factor. *"Since factors contain differing numbers of subjects producing statement totals of differing magnitudes, it is convenient for purposes of comparability to normalize the total column, converting each item total to the score"* (p. 242, Brown, 1980), calculated by Equation 4-2. This removes the arbitrary effect of the number of Q-sorts associated with one of the factors, as well as the effect of their differing factor weights. The resulting z-scores can be directly compared with scores for the same statements in other factors.

Equation 4-2 Calculation of the factor score of individual criteria

$$z_a = \frac{T_a - \overline{X_T}}{s_T}$$

T_a = sum of the weight-scores for criterion *a*
X_T = average value of all criteria in all Q-sorts loading on this factor
s_T = standard deviation

The qualitative part of Q-methodology aims at explaining the similarity in the identified perspectives. Therefore, in the introduction of each interview some facts about the interviewee

and the project are noted, such as the educational background of the project manager, type of contract, budget, et cetera. When the sorting is finished and the respondent is satisfied that his Q-sort represents his perspective, he is interviewed about the decisions made. The researcher questions the respondent about the statements that scored high, those that scored low and the neutral statements. Is the reason for ranking neutral brought about by indifference, or is there a reason for placing those statements on score 0? It is important to note that the criteria are ranked in relation to each other. Finally, some additional questions are asked to gain more understanding of the personal perception of the project. When studying the correlations between the Q-sorts performed, this information is used to provide possible explanations. If shared perspectives by a number of public project managers indeed exist, the background information on the participants and their projects provides us with a starting point for trying to explain the similarities in views. The contextual information on the public project manager's choices made in the Q-sort, gives us an insight into the internal mind-set of the project manager. Both the facts and the internal mind-set of the project manager help us to explain the similarity in viewpoint in the identified groups.

4.4 Conducting a representative Q-sample

The concourse relating to the criteria used in judging project success in the construction industry is extracted from 22 literature sources discussing the topic of project success. The concourse is the totality of statements surrounding a specific topic; the Q-sample is the subset of statements relevant for the research in question and which will be used in the Q-sorts. In this study the concourse consists of all possible criteria that can be used to judge project success. From these a total of 25 criteria were identified that could be considered relevant in judging project success, which can be found in Figure 4-2.

In the first Q-sample we included all criteria mentioned in at least four of the 22 literature sources. An exception was made for the criterion *environmental impact and sustainability.* We included this criterion in the Q-sample because it reflects the current dedication of the Dutch government to sustainability (Rijkswaterstaat, 2011b). Furthermore, we excluded *the satisfaction of the needs of the client* because the 'client' was the subject of our research. The term client could indicate the client organization: whose needs and requirements are included in the criterion *satisfactory benefit to client organization*; or it pointed to the public project manager. His needs or wishes are combined in the criterion *personal growth and development*.

To make sure the criteria were absolutely clear to the respondent, distinguished enough to sort them, and to see if any criteria are missing, five test interviews were conducted. The test

respondents were employed by a commercial party (consulting company), but were familiar enough with the role of a public project manager to assume this role for the test. Based on these test interviews some changes were made in the Q-sample. The test made it clear that it was difficult to distinguish between the criteria *technical performance* and *quality* and therefore they could not be ranked separately. In the final Q-sample we included *technical performance* in the definition of *quality*. Furthermore, the definition of *preparing for the future* focused on commercial goals: entering a new market or launching a new product line. The goals in this definition are not associated with public parties. The criterion was therefore removed from the Q-sample. We argue that there is a way that a public party prepares itself for the future by familiarizing the organization with new techniques and gaining new knowledge. Therefore, the definition of the criterion *learning opportunities*, which was already in the Q-sample, came to include the way new knowledge can help the organization in the future. It also became clear that the criterion *satisfactory (commercial) benefits to client organization* was much too commercially formulated and its public equivalent needed to be identified. The direct benefits of a project to the public client organization are fundamentally related to social or political issues. The criterion was therefore rewritten to *project specific political or social factors*. The criterion now also included the impact of the project at the political level: which in advance was identified as being important for public parties, but not identified as a criterion in the literature study. It can be argued that this new criterion also includes the *economic benefits for surrounding community* from the concourse, which was named in one literature source and therefore not included in the first Q-sample. The criterion was generalized – instead of purely economic benefits for the surrounding community it now related to all possible social aspects. Though the concrete social motive for initiating a public project may differ, there should always b e either a social or political motive. The nature of the initial motive was identified in the actual interviews.

Figure 4-2 Criteria extracted from and their occurrence in the literature (concourse)

Relevant articles on project success, in chronological order

#	Criteria	De Wit (1986)	Pinto & Slevin (1988)	De Wit (1988)	Parfitt & Sanvido (1993)	Wateridge (1995)	Belassi & Tukel (1996)	Munns & Bjeirmi (1996)	Shenhar & Wideman (1996)	Atkinson (1999)	Lim & Mohamed (1999)	Shenhar et al. (2001)	Cox et al. (2003)	Westerveld (2003)	Müller & Turner (2004)	Klimoski & Webber (2004)	Bryde & Robinson (2005)	Jugdev & Müller (2005)	Chan et al. (2006)	Turner (2007)	Frödel (2008)	English et al. (2009)	Toor & Ogunlana (2010)	Sum
1	Iron triangle: Cost	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
2	Iron triangle: Quality	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
3	Iron triangle: Time	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
4	Satisfies needs of consumers / users (perceived performance)		1		1	1	1	1	1	1	1	1		1		1	1	1		1			1	15
5	Satisfactory (commercial) benefit to client organization	1	1		1	1		1	1	1	1	1		1				1			1		1	13
6	Technical performance (meets technical objectives)		1	1	1			1	1	1	1	1			1			1		1		1	1	13
7	Satisfies needs of client		1	1	1	1	1	1	1		1			1				1		1		1		12
8	Satisfies needs of stakeholders		1	1	1			1	1		1			1			1	1				1	1	11
9	Achievement of purpose / fit for purpose		1	1	1			1	1		1	1						1		1			1	10
10	Satisfies needs of project team		1	1	1						1		1	1				1		1				8
11	Commercially profitable for contractor		1		1						1	1		1				1		1				7
12	Efficient use of allocated resources	1					1				1		1					1	1				1	7
13	Safety					1					1	1	1						1			1	1	7
14	Educational aspects for organization (learning benefits)					1			1	1		1		1					1					6
15	Personal growth/development					1					1		1					1					1	5
16	Preparing for the future (new market, new product line, new technology)								1			1						1	1					4
17	Absence of conflicts/legal claims					1													1				1	3
18	Environmental impact and sustainability									1									1				1	3
19	Managerial and organizational implications									1								1					1	3
20	Satisfies providers of finance (if not same party as client)				1													1		1				3
21	Right process was followed		1												1									2
22	Terminated reasonably / effectively				1													1						2
23	Economic impact on surrounding community									1														1
24	Professional image					1																		1
25	Reduced conflicts and disputes																						1	1

Sector
☐ Private
Public
▨ Both/not specified

In the test interviews respondents were asked if they thought any criteria were missing from the list. With the obtained information we added five other criteria from the concourse to the Q-sample. Some of these had been mentioned once or twice in literature and were, based on the selection criterion *mentioned at least four times* excluded from the first Q-sample. These criteria were added to the final Q-sample: *the impact of the project on the professional image of the client organization*, whether *the right process is followed* and whether *a good working relationship with the contractor* exists, and *the satisfaction of shareholders* and *the continuation of the client organization*. The satisfaction of shareholders relates to those parties that play a role in financing the project, but do not belong to the client organization. A co-financer

has a different role in the project than a regular stakeholder who does not contribute to the budget. The topic of *continuation of client organization* was raised during the test interviews. Though this is not relevant for all parties, the added value and therefore the right to exist of some public organizations is under discussion. If so, the execution of the project can help to demonstrate what the organization is worth. This new criterion also partly included the criterion managerial and organizational implications that was identified in the concourse, but not in the Q-sample because of its minimum appearance in literature. This research focuses on projects that are being executed or have been completed, not on those that are terminated in the process. The final set of criteria (the Q-sample) can be found in Table 4-1.

Table 4-1 Q-sample

No.	Criterion*
1	Delivered on time
2	Efficient use of available resources
3	Fit for purpose
4	Learning opportunities for client organization
5	Personal growth and development
6	Profitability for contractor
7	Quality
8	Safety
9	Satisfies needs of project team
10	Satisfies needs of stakeholders
11	Satisfies needs of users
12	Within budget
13	Effect on the professional image of client organization
14	Good working relationship with contracting partners
15	Impact on the environment, sustainability
16	Right process is followed
17	Continuation of client organization
18	Project specific political or social factors
19	Satisfies needs of shareholders

* For definitions of terms as presented in the interviews see Appendix II

From the concourse and Q-sample analysis two important conclusions can be drawn. Firstly, it seems that a number of criteria cannot be copied literally. Due to the focus of literature on the private sector, the corresponding criteria and definitions are commercially oriented; the terminology does not suit the public sector. However, it is possible to determine the public equivalent of the private criteria. A second conclusion is that some criteria that have received only limited attention in literature, are presumed to be especially relevant in the determination of public success. However, the real importance of these criteria in assessing public sector project success can only be determined conclusively after the Q-sorts.

Since some of the criteria might be interpreted differently by the respondents, it is important to provide them with definitions that define unambiguously what is meant by each criterion, so that the rankings are performed based on equal information. To prevent misinterpretation of the criteria, definitions are set up for each of the criteria. To be sure that every respondent fully understands what is meant, a list of definitions was given to the respondents (Appendix II) before conducting the Q-sort.

4.5 The public project manager (P-set)

In the public organization several managerial levels can be distinguished. The most obvious are the political level and the level of civil servants (officials). In this research we are looking at the public side of a construction project initiated by a public party and executed by private contractors. Therefore, the managers included in the research (P–set) are those who are executing a project assignment within their own, public organization and who are considered as representing the client in view of the private organization(s). These managers are acting at the interface between public and private organizations. Differences in success perception between public project managers and private project managers will lead to tension in public/private partnership arrangements, a context in which infrastructural projects are quite often performed. The respondents had to hold that role for at least two years so the internal frame of reference associated with this role had been fully established.

For the P-set we also set some preconditions for the project the public manager was working on. The project had to be an infrastructure or construction project, executed with a contract without a finance component and either being tendered, executed or recently finished (<2 years). The P-set includes 26 public project managers from several local (35%), regional (35%) and national (30%) governmental organizations who manage projects that meet the pre-set conditions. These 26 public project managers have ranked the 19 criteria according to the ranking sheet and were interviewed afterwards. Two other interviews were conducted, but these were not included in the analysis because during the interview it became clear that they did not meet the pre-set conditions. The final P-set in the analysis contained 23% female and 77% male project managers. The educational background of the project managers from the P- set varied: engineering (54%), urban planning/architecture (19%), other (27%). The contract form of the projects also differed: D&C/E&C (46%), traditional (31%) and other (24%). The projects included a range of execution budgets: >100MEuro (19%), 50-100MEuro (31%), 10-50MEuro (31%), <10MEuro (19%).

4.6 Results

The respondents' perspective on project success is captured in the final ranking of the success criteria in the ranking sheet (Q-sort). The ranking sheets are the raw data used for analysis. The analysis aims at identifying common perspectives between groups of interviewees. By means of manual rotation three final factors were obtained from the Q-sorts. The factors are the common perspectives shared by the public project managers that make up the factor. Each of the individual Q-sorts has a loading on the three final factors; this loading is the correlation of that Q-sort with the specific factor as shown in Table 4-2. These factors were accepted because they met two criteria: one related to the significance of the loadings of the Q-sort (Equation 1) and one related to the significance of the factors themselves (2*SE > 0.46: Brown, 1980). Factor 1 and 3 are significant at the 0.01 level and Factor 2 is significant at the 0.05 level.

Table 4-2 Factor Matrix with each Q-sort's loading on these factors*

Q-sort	Factor 1	Factor 2	Factor 3
Respondent_1	-0.0502	0.5721	0.7588*
Respondent_2	0.1438	0.2672	0.0522
Respondent_3	0.1080	0.0831	0.0652
Respondent_4	0.4443	0.3962	0.2359
Respondent_5	-0.1139	0.0646	0.8294*
Respondent_6	-0.1191	0.2701	0.7180*
Respondent_7	0.4628	0.5174	0.0655
Respondent_8	-0.2268	0.7070*	0.2807
Respondent_9	0.7987*	0.3767	-0.0450
Respondent_10	0.0760	0.5755	0.1877
Respondent_11	0.1681	0.5507	0.3762
Respondent_12	0.1033	0.8891*	0.0883
Respondent_13	0.1531	0.4225	0.3799
Respondent_14	0.4126	0.7718*	0.0275
Respondent_15	0.4148	0.7457*	0.0658
Respondent_16	0.6115*	0.3755	0.3505
Respondent_17	0.6355*	0.2560	0.1590
Respondent_18	-0.2635	0.5610	0.2355
Respondent_19	0.0342	0.6216*	-0.2008
Respondent_20	0.5690	0.7034*	-0.0500
Respondent_21	-0.1253	0.2646	0.7018*
Respondent_22	-0.1582	0.7124*	-0.1775
Respondent_23	0.2022	0.4871	0.2072
Respondent_24	0.4894	0.5651	0.0719
Respondent_25	0.6541*	0.0899	0.1185
Respondent_26	0.3174	0.6610*	0.0335

* Colored cells indicate significance at the 0. 05 (P<0.05); (*) indicates significance at the 0.01-level (P<0.01)

Four respondents (Respondents 2, 3, 4 and 13) do not load on any of the factors: non-loaders. Respondents 1, 7, 20 and 24 are confounders: their Q-sorts are loaded on two factors. Respondent 7 and 24 have a hybrid view, a combination of two factors. Respondent 1 and 20 are confounders at the $P<0.05$ level, but they are only significantly loaded at $P<0.01$ on one factor. It was decided to include the confounders' Q-sorts in the factors on which their loading is highest so as not to lose their perspectives entirely in the analysis phase (Webler et al., 2009).

The factors are qualitatively interpreted: this interpretation is done contextually with the help of the information from the interviews.

4.6.1 Distinguishing criteria

Each perspective has its own internal view on project success, reflected in its collective Q-sort of the 19 criteria. Nevertheless, the first remark we make is based on the ranking of the three criteria of the *iron triangle* in the induced perspectives. In none of the perspectives the *iron triangle* criteria form the top three. The z-scores of these criteria, calculated with Equation 2, are visualized in Figure 4-3 (z-scores per perspective: perspective (1), z-score: 0.480, rank: +1; (2) 0.589, +1; (3) 0.000; 0). As can be seen in this figure it was either *in time* or *within budget* that was prioritized, whereas *quality* is a relatively unimportant success criterion for all public project managers (z-scores < 0.6).

Figure 4-3 Z-scores per perspective on the criteria time, budget, and quality
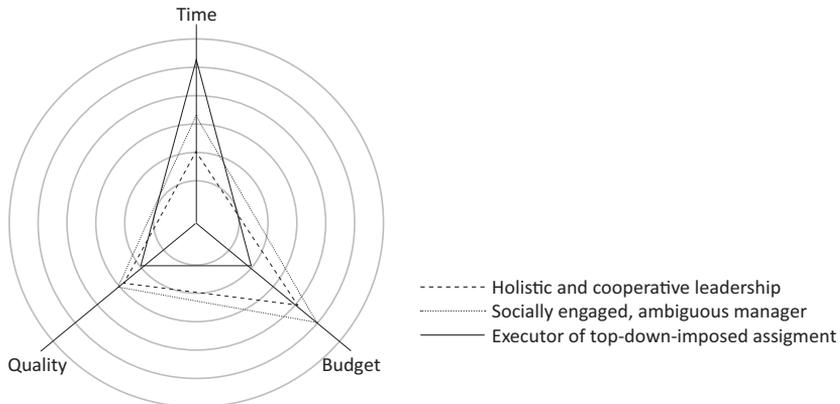
Besides *delivered on time* and *within budget* the z-scores of seven other criteria were so very different between the perspectives that they can be used to explain the differences between these viewpoints (Table 4-3). A prominent difference between perspective 1 and perspectives 2 and 3 is made by the criterion *right process is followed*. In perspective 1 this is the least

important criterion (-1.881, -3), whereas in perspective 2 this criterion scores neutral (-0.186, 0) and in perspective 3 even more positive (0.419, +1). Interpretation of the scores showed an opposite tendency the criterion *profitability for the contractor,* which is relatively important in perspective 1 (-0.275, 0) compared to perspective 2 (-2.119, -3) and 3 (-1.109, -2).

The criterion *satisfies needs of stakeholders* distinguishes between perspective 3 and the other two perspectives. Where the first two perspectives see this criterion as important for project success (0.971, +2; 1.247, +2), the third perspective ranks this criterion almost least important (-1.77, -2). Based on this quantitative analysis and the qualitative analysis of the comments noted during the sorting and the interviews with the respondents we interpreted the factor results and named the three perspectives:
-   Perspective 1: holistic and cooperative leader;
-   Perspective 2: socially engaged, ambiguous manager;
-   Perspective 3: executor of a top-down assignment.

Table 4-3 Factor scores of distinguishing criteria with corresponding ranks

Success criterion	Perspective 1		Perspective 2		Perspective 3	
	Z-score	Rank	Z-score	Rank	Z-score	Rank
Within budget	1.126	2	1.592	1	-0.080	10
Delivered on time	-0.036	11	0.655	6	1.660	2
Quality	0.480	7	0.589	7	0.000	8
Right process is followed	-1.881	19	-0.186	10	0.419	6
Safety	2.048	1	-0.059	9	1.055	3
Profitability for contractor	-0.275	12	-2.119	19	-1.109	17
Satisfies needs of shareholders	0.623	5	-0.329	12	-2.131	19
Satisfies needs of stakeholders	0.971	3	1.247	3	-1.177	18
Fit for purpose	0.480	8	1.176	4	-0.583	15
Project specific political or social factors	0.297	10	1.444	2	1.988	1

Distinguishing criteria: • (loading per perspective) > 1.500
Z-score calculated according to equation 2
Rank from most important to least important within a perspective
See Appendix III for the complete list of factor scores

These three public perspectives on project success are explained in the following paragraphs.

4.6.2 Perspective 1: Holistic and cooperative leader
The first perspective is significant at the 0.01-level (Table 4-2) and combines four public project managers active at the local, regional and national level. The level at which the public project manager executes his tasks is therefore not the binding characteristic in this perspective. Safety is evidently the main focus in this perspective (Figure 4-4). This criterion has three components: safety for the workers during execution, safety during construction for the bystanders,

and safety of the finished construction during its implementation phase. Respondent_9 stated: *"Safety issues are the most important focus point, especially in complex, city environments."* All three of these components are mentioned by public project managers. Which component *of safety* was meant when prioritizing this criterion depends on the nature of their project and the environment in which it was executed.

The four public project managers that hold this perspective are all technically educated. However, this is the only quantifiable characteristic that binds these four public project managers and though it provides a basis for interpretation it is not statistically significant. In the other characteristics no overlap exists. What seems to connect the public project managers that share this collective perspective is their attitude towards the execution of projects. They seem to agree that projects are not executed for politics, but for its users; politics is viewed as less important than stakeholders and users. Following the right process is deemed unimportant, as long as the project is executed lawfully. In the words of Respondent_16: *"Only use the predetermined procedures when necessary in achieving the goal."*

Figure 4-4 Factor scores of perspective 1 from most to least important criterion
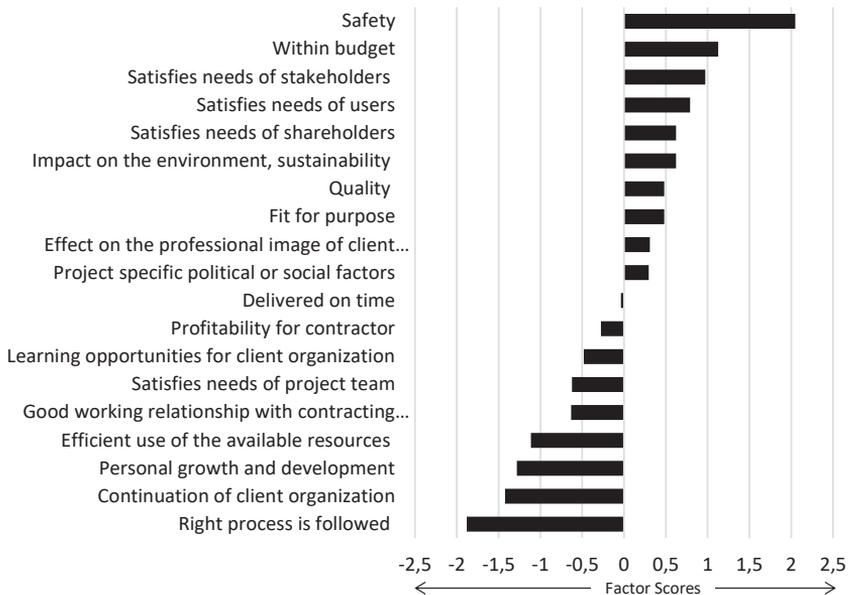
In the interviews these public project managers have stressed the importance of cooperation. To some extent this is reflected in the factor score: the criterion profitability for the contractor scores a little lower than neutral, but much higher than in perspective 2 where this criterion is

undoubtedly the least important, or the meagre score of -1.109 in perspective 3. Respondent_17 expressed his view on this criterion during the sorting, *"It can never be a governmental organization's goal to let contractors work for a loss. (...) Preferably we execute a project where the contractor can make a normal profit. (...) Though we have only a limited influence on this issue."* The importance attached to cooperation by these managers is to a larger extent reflected in their statements. Though no direct basis for further cooperation in their contracts exists (both traditional and integrated building contracts), these respondents have sought another way to expand teamwork within their own organizations, and especially with other parties. The public project managers in perspective 1 try to focus on the end result as common goal. They realize that cooperation leads to the best end result.

4.6.3 Perspective 2: Socially engaged, ambiguous manager

Remarkable in the factor scores of perspective 2 is the absence of clear prioritization for the important criteria. The four criteria considered most important score in absolute terms almost equally; the scores of these criteria lie within the range of 0.42 points of each other. These criteria are: within budget (+1.592), political or social factors (+1.444), satisfaction of stakeholders (+1.247) and fit for purpose (+1.176). Fourteen public project managers, who are all executing projects at either the local or regional level, are significantly loaded on the second factor (significance $P<0.05$), as shown in Table 4-2.

The similarity between the project managers in perspective 2 is that they all (except for one manager of a district water board) have contact with the politician responsible for the project. Though this is not a statistically significant explanation, it serves as a guide in the interpretation. In the interview most of the respondents indicate that they do not feel much political pressure, but they are aware of the political factors influencing their project. Respondent_10 stated: *"Yes, there is direct contact with the alderman, maybe even too much."* We concluded that perspective 2 is held by public project managers who realize that they are not just executing a project, but they are socially engaged and are actually working at improving their region or city. The social motive behind the project is stressed in most interviews. Respondent_12: *"(..) you aim at improving the city, not just building a bridge."*

In perspective 2 the iron triangle is considered relatively important in determining project success, as can be seen in Figure 4-5. Delivering the project within budget is the most important criterion, which is related to a number of aspects. Firstly, these project managers do not want to waste public money. During the Q-sorting process respondents mentioned that they feel obliged to spend tax payers' money wisely. Secondly, due to the economic recession in The Netherlands many municipalities face budget cuts and struggle with their financial balance. *"There is just no more money; this is it,"* (Respondent_22). A third explanation is found in the

relative scale of the projects. For many of the local parties the project budget is large in relation to the budget of the more regular activities. In the words of one of the respondents (Respondent_19): *"It was so much trouble getting the money together. The most important task now is to stay within budget."* Based on the information gathered from the interviews we can explain the low score for *profitability for contractor*. These public managers feel a responsibility towards tax payers. Respondent_8 said, *"Profitability for contractor is his own responsibility, unimportant to us, but it seems that the contractor will not be making a profit here."*

The managers in this perspective also hold a particular view on the criterion of the right process. Whereas the managers in perspective 1 do not believe in the ultimate 'right' process, the managers in this perspective 2 have another view. Respondent_12: *"Following the right process is very important for a municipality. It is about managing expectations, standing by your agreements, following the right steps, so it is clear [to the public] what is to come."* This right process is also related to the close relationship that exists with politics and accountability. The relationship with politics is ambiguous; they do have close contact with the responsible politician, but are not forced in a specific direction (as in perspective 3).

Figure 4-5 Factor scores of perspective 2 from most to least important criterion
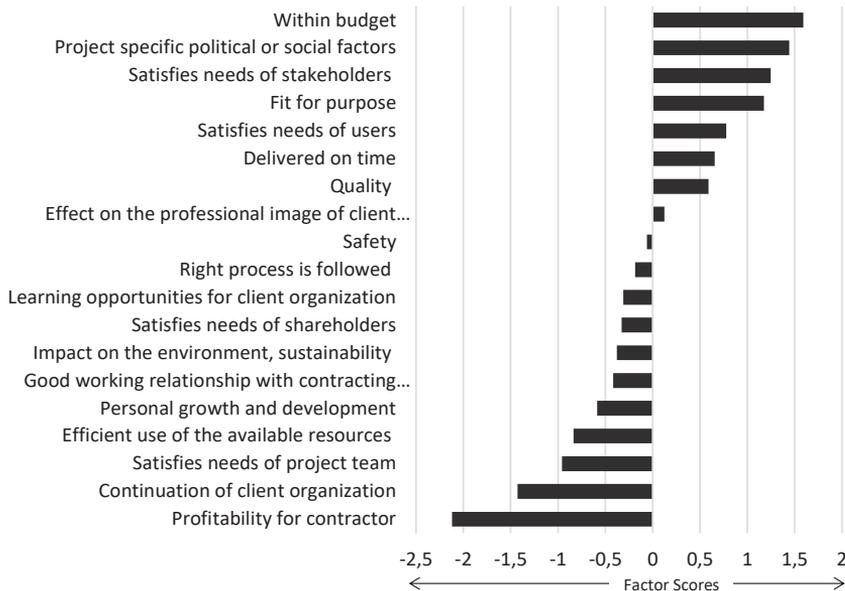
4.6.4 Perspective 3: Executor of top-down imposed assignment

The third perspective is significant at the 0.01-level (Table 4-2) and is held by public project managers that are executing their job at the regional or national level. Four public project managers are loading on this factor, so the qualitative interpretation of the result is less strong than in perspective 2. The link between the public project managers who hold this perspective cannot be found in the characteristics of the managers themselves. From the interviews it seems that these public project managers can be linked by the top-down pressure of politics: the execution of the assignment is imposed top-down on these public project managers and this influences their prioritizing of the success criteria. Though no contact with the politician responsible for their projects exists, the respondents explain in the interviews that top-down pressure is perceived. This perspective relates to projects that were only initiated because of political motivations or for which execution was given priority by politicians. This priority relates mainly to a strict deadline given by the politician (a deadline which is broadly communicated in public, can be seen as a political promise and to which the responsible politician has connected his political career); the pressure for the public project manager to meet this deadline is high (Figure 4-6). Respondent_6: *"There is a management planning for the political level, and a contractors planning; the first one is sacred."* Respondents loading on this perspective judge their project politically sensitive.

The right process is deemed important because accurately following the process is a means of preventing any legal dispute that might arise. Respondent_6: *"The right process is the basis. If something goes wrong and your process is found not to be in order, your position is very weak."* Opposed to perspective 2, the political pressure experienced by the project managers in perspective 3 is translated into a quantifiable project goal and thereby provides the public project managers clear guidance throughout the project; the deadline provides a clear focus. Respondent_5, who managed a project that was tied to a clear political promise, remarked: *"Whatever happened, the deadline had to be met."* This strict condition forces the managers in perspective 3 to be very goal-oriented. Their main goal is timely delivery. This is so essential that it seems to have pushed the criterion *stakeholder satisfaction* to the background. Respondent_21: *"The stakeholders did have a sounding board – to express their wishes, but this was mostly to let them have their say (...). In the end the stakeholders' voice was unimportant in the project."*

Figure 4-6 Factor scores of perspective 3 from most to least important criterion
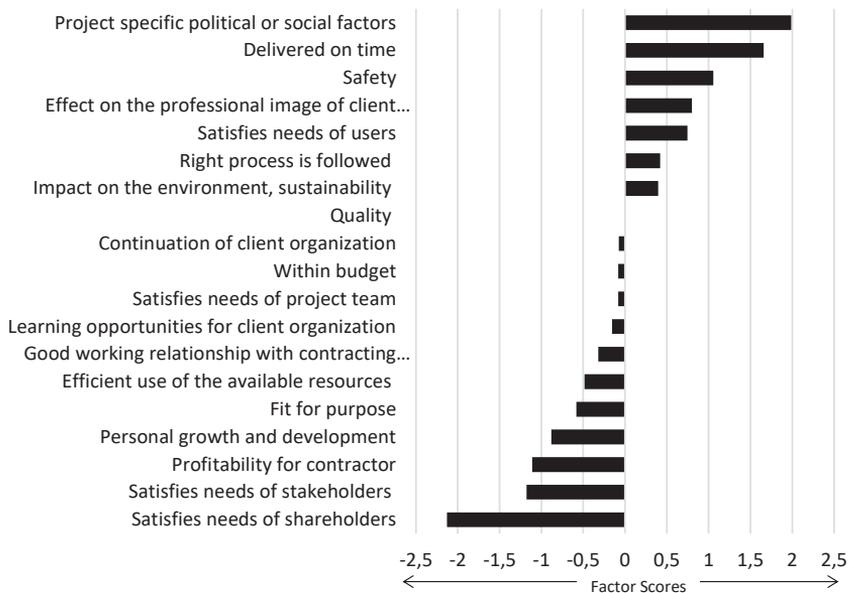
4.7 Discussion

Although the results of the Q-sort are clear, some comments about the results of this study have to be put forward. Though the public project managers seem to have a good idea of what determines project success for them, the question remains whether they make choices during the project that do increase their project's success. Do the public project managers really pursue the form of success that they have specified in our research? In other words: Do they practice what they preach? We recommend additional research on the consistency between the perception of project success and the actions taken by the project managers (and PDO) to reach project success.

Another comment must be made about the identified links between the perspectives and the characteristics of the respondents. The qualitative meaning that is given to these qualitative results is the interpretation of the researchers. Although based on the characteristics of respondents and their answers combined with the weighted ranking, perspective 1 and 3 are based on a small number of respondents. Extension of the research would be useful to verify whether there are more project managers in line with these perspectives, or that additional perspectives can be identified.

Moreover, the conducted Q-sorts were only a snapshot of the success perspectives of the public project manager at that phase in the project at the time of the interview. We believe that the perspective on success can change throughout the project, with criteria gaining or losing importance during the project's life cycle. In order to make any final statements about this relation it requires more research.

4.8 Summary and conclusions

Though the literature has widely covered the subject of project success, it was so far unclear which criteria the public project manager of large infrastructure projects valued most. This research indicates that Dutch public project managers manage their projects either *within budget* or *on time,* but that a clear priority has been set between these two criteria of the iron triangle. *Quality,* the third criterion of the *iron triangle,* is a relatively unimportant success criterion to them. This does not mean that public project managers do not value *Quality,* but it is not prioritized in the top 3 of possible success criteria. For private partners this means that their clients consider *Quality* a minimum feature. To increase the experienced project success of their client – the PDO manager - it is better they focus on other criteria.

The research reveals three different perspectives (points of view) Dutch public project managers can have on the success of their projects:
1. The holistic and cooperative leader, who is concerned with the safety of the project and isactively searching for a common interest with the private partner.
2. The socially engaged, ambiguous manager, who is looking to add value to his region or city, with the lowest possible social costs.
3. The executor of a top-down assignment, who is fulfilling a political promise.

Whereas the first and second perspective represent an intrinsic attitude, the third perspective seems to be driven by external pressure. The explicit goal *(delivered on time)* provides clear guidance during the project. The main difference in the attitude of perspective 1 and perspective 2 is the way they approach the concept *project team.* For perspective 1 the project team is the composite organization of its own organization and the contractor's organization. Perspective 2 considers the team of his own organization (PDO) the project team. The criteria *profitability for contractor* and *right process followed,* which were only mentioned sporadically in existing literature, proved to be valuable in this context. Both criteria revealed differences between the perspectives.

For private partners collaborating with PDO managers, like contractors of consultants, this research is of specific value. The results show that each perspective requires a specific approach for successful collaboration. The manager of the PDO who adopts the first perspective is most open to a collaborative relationship. He considers the private partner part of the team that is needed for project success. In contrast, the manager of the PDO who adopts the second perspective is not interested in the private partner at all. He considers the private partner as a necessary component, but also a threat for accomplishing his most important success criterion *within budget.* The PDO manager with the third perspective is again a completely different partner for private companies. This manager considers his project a success when he accomplishes project goals within the given deadline. Collaborating with this PDO manager means a lot of attention must be paid to planning and risk management of events that can be considered a threat to the planning.

The success criterion *project specific political or social factors,* as added in this research, has proven to be extremely valuable. In two perspectives, representing the majority of the respondents, this criterion is the most or second most important criterion. This is in line with the results of Hertogh and Westerveld (2010). Especially on the level of regional or local government, where public project managers have direct contact with the responsible politician, it is a leading success criterion. The criterion can have a potential overlap with other criteria, in which case the same criterion was measured twice. For instance, in perspective 3 the s*pecific political issue* seems to be *delivered on time.* The meaning of the general term *project specific factors* was further analyzed in the qualitative part of this research and from the interviews it became clear that specific *political issues* are an important success criterion; respondents did not mention project specific *social issues.* Despite the differences in viewpoint, all public project managers are very client oriented.; Differences in opinion exist on who the most important clients are: users, stakeholders or politicians, and how these clients can best be served. Chou et al. (2013) had similar results for success indicators in Taiwan. So the *satisfaction of needs of the client,* a criterion that was left out from the Q-sort for several reasons (paragraph 4), is in essence usable but has to be divided into specific categories to be absolutely clear.

In line with the results of Bakker et al. (2010) we found different perspectives within a group of supposing similar respondents (Bakker et al., 2010). This insight is useful to all managers belonging to a group of governmental project managers. Though they seem to be aligned with their colleagues discussing project success and the importance to look after the interest of their client, there are substantial differences between the perspectives within this group. Based on these findings managers of PDOs are encouraged to explicitly align the success of their project with the governmental organization they are coming from.

In the process of selecting the right Q-sample we added 5 criteria after the test interviews. The identification of *shareholders* as a particular client is already mentioned. The *impact of the project on the professional image of the client organization* scored neutral in all perspectives, as did the *good working relationship with the contractor.* But the latest was very useful in explaining differences between perspectives, mostly supported by the interview results. Although the *right process is followed* has proven valuable as a distinguishing criterion, it cannot be seen apart from the political context as provided in the interviews. The *continuation of the client organization* was found relatively unimportant by all perspectives. The position of this criterion was nevertheless distinguishing between the perspectives.

Prior to the research literature we could not find literature evidence of project success being cultural dependent. Based on our empirical findings, we could suggest a certain influence of culture on project success. Is the way project success is perceived by public project managers a specific Dutch outcome? We mentioned the importance for private companies to (better) understand their public clients in their specific context in order to perform successfully in these infrastructural projects. Given the increasing internationalization (large infrastructure projects are often put up for tender in an international market), the research on project success perspectives will be expanded to other countries in near future.

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Chapter 5 International perspectives on project success

Abstract

Public and private project managers contribute to the success of Large Infrastructure Projects. Considering the public client, so far researchers have been looking at him in a passive role with respect to project success. The focus of this exploratory research is what public project managers who are actively involved in the project, consider project success. Using Q- methodology, we identify four viewpoints in the respondent group, consisting of managers from five North-Western European countries and the specific success criteria accompanying these viewpoints. Within each viewpoint, the managers have the same vision on the ranking of project success criteria. Next to the Conventional project manager, we distinguish the Product- driven manager, the Parent-Oriented manager and the Manager with a stakeholder focus. In Large Infrastructure Projects, where public and private partners collaborate, awareness of these different perspectives will help to understand the motives of the public project manager.

5.1 Introduction

Project success is widely discussed in the literature. Both the determination and the realization of project success is subject of worldwide research and many articles published (Ogunlana and Toor, 2010; Pinto and Slevin, 1988; Wit, 1988). Research on the achievement of project success aims for the factors that contribute to, or enlarge, the chance of project success (Chan et al., 2004b; Mir and Pinnington, 2014; Parfitt and Sanvido, 1993). Other studies try to gain insight in the criteria used to measure project success (Baccarini, 1999; Chan, 2001; Prakash Prabhakar, 2008c; Shenhar and Wideman, 1996; Westerveld, 2003; Wit, 1988). Researches in the field of project success agree on the fact that the judgment of project success depends on the perspective taken (Bakker et al., 2010; Bryde and Robinson, 2005b; Müller and Jugdev, 2012; Rashvand and Zaimi Abd Majid, 2014). The client is often mentioned as an important factor in achieving project success (Bresnen and Marshall, 2000a; Phua and Rowlinson, 2004; Shenhar et al., 2001; Thompson, 1991), but most studies consider the client as an external factor and not so much in an active role towards the achievement of project success.

The initiators and clients of large infrastructural projects in Europe are governmental organizations. The government is a Project Oriented Organization (Arvidsson, 2009). In this type of organization, projects are external elements that prepare changes to the general work processes in the parent organization. The parent organization appoints a project manager to manage the project and the implementation of the new situation in the parent organization (Hertogh et al., 2008a). For the governmental organization(s) this project manager is the representative of the project. Hertogh et al. (2008a) distinguishes Client/Sponsor for the representatives of the parent organization(s) and labels the project management team responsible for the project the Project Delivery Organization (PDO). However from the contractor's point of view, the manager of the Project Delivery Organization serves as the client for the project. Hence from the viewpoint of the parent organization the contractor's client is considered as a part of the project organization. Because of that, the *public project manager can* also be considered in an active role in achieving project success.

A number of studies have tried to gain insight in the key success criteria used by different parties (Bryde and Robinson, 2005b; Frodell et al., 2008; Turner, 2007) but these studies only very limitedly relate to the public sector. Studies that do relate to the public sector report a difference in internal frame of reference in the public sector compared to the private sector (Thiel and Leeuw, 2002). Therefore we are interested to know what project success is from the viewpoint of the public project manager. Recent research in the Netherlands (Koops et al., 2017) revealed three different viewpoints on project success taken by Dutch public project

managers: the holistic and cooperative leader, the socially engaged, ambiguous manager and the executor of a top-down assignment.

Within the European Union, large infrastructural projects are put up for tender in an international market, and can be cross-border projects. In this international context it is essential for private companies, consultants or contractors, to better understand their public client, in order to come up with internationally competitive bids and be able to successfully collaborate. However, the limited knowledge on which success criteria are considered essential by the public project manager can lead to a mismatch of expectations. Differences in business culture among countries might amplify the potential mismatch, so we need to incorporate cultural insights in this specific context (Jackson and Aycan, 2006).

In the Dutch study (Koops et al., 2017), the objective was to explore managerial viewpoints on project success and the specific success criteria accompanying these viewpoints. The nature of the distinguishing criteria in the Dutch study let to the assumption of cultural influence, especially the distinguishing criteria the *right process followed, satisfying needs of stakeholders / shareholders* and *profitability for the contractor.* Hence we expected preferences on specific success criteria and believed this could have influence on project success perspectives amongst international respondents.. The research is limited to public project managers acting at the interface of their own public organization and the private partner. They are responsible for the preparation and execution of the project. The research is based on Q- methodology (Brown, 1980, 1993; Exel and Graaf, 2005) and includes the viewpoints of public project managers from Belgium, The Netherlands, Sweden, Denmark, Finland and the UK. The countries are selected from the NETLIPSE network: a network for the dissemination of knowledge on the management and organization of large infrastructure projects in Europe (www.netlipse.eu).

The performed research aimed at identifying the main success criteria in the perspective of public project managers of different Western European countries. The research in The Netherlands revealed that specific criteria outside the *iron triangle* were distinguishing for differences in viewpoints. The nature of these criteria let to the assumption of possible influence of culture in ranking of success criteria. Both researches are performed in order to contribute to the understanding of the public side of public private collaboration in the increasingly international construction industry. Preliminary results of this international study were presented at the IPMA-world congress 2014 (Koops et al., 2015) and were elaborated since then, resulting in this paper.

5.2 Literature overview

5.2.1 Public project success

Success criteria need to be separated from success factors, as both appear often in literature. Criteria are the measures by which projects can be judged in terms of failure or success (Cooke-Davis, 2002). It is often mentioned that projects are successful if the iron triangle criteria are met: delivered on time, within budget and meeting the preset quality measures (Atkinson, 1999; Jha, 2011; Lim and Mohamed, 1999b; Mantel and Meredith, 2009; Morris et al., 2010). De Wit (1988) showed that these measures alone are not sufficient to determine the project's success. The increase in scope and complexity of contracts and projects lead to an increase in criteria (Bryde and Robinson, 2005b), like safety, quality of the set requirements, the effect on the contracting organization, amongst others (Cox et al., 2003; Mantel and Meredith, 2009; Winch, 2010). Several authors have grouped criteria to create overview (Baccarini, 1999; Westerveld, 2003). Al-Tmeemy et al. (2011) introduced a categorization scheme including criteria related to product success, market success and project management success. The categorization of criteria Shenhar et al. (1996) developed, refers to the timeline of a project: pre-completion, short term, medium term and long term. Sometimes a distinction is made between project success, as to the success of the outcome or benefits of the project (Shenhar et al., 2001) and project management success, related to the controllability of the process up to project delivery and handover (Munns and Bjeirmi, 1996). In this paper, the notion of *project success* includes *project management success.*

Although some studies approached project success from different perspectives (Bryde and Robinson, 2005b; Frodell et al., 2008; Lim and Mohamed, 1999b; McLeod et al., 2012; Turner, 2007), most studies focus on the success criteria relevant for the executing party, represented by the commercial project manager (Cooke-Davis, 2002; Mir and Pinnington, 2014; Munns and Bjeirmi, 1996; Pinto et al., 2009; Wit, 1988). Davis (2014) noted a lack of research on the perception of project success of the more senior roles in an organization. She included the owner in the senior management group. If encountered, the *client organization* means usually a private sector client (Shenhar et al., 2001; Thompson, 1991) and not the public (governmental) party that is commissioning the large infrastructure works. The client is often viewed from an external perspective and his main task seems the involvement and provision of management support. Literature was found on relationship, cooperation and information exchange between private managers and client's (Chan et al., 2006; Pinto et al., 2009; Thompson, 1991; Turner and Müller, 2004b; Webber and Klimoski, 2004), but with little emphasis on the clients view on success criteria. Even if some public success criteria are mentioned, supposedly important aspects for the public side, like political influence or sustainability, are left unmentioned (Bryde and Robinson, 2005b; Toor and Ogunlana, 2010). Public actors tend to copy the well-developed private suc-

cess indicators, with the risk of inadequacy (Thiel and Leeuw, 2002). Müller and Jugdev (2012) identified the relationship between the perception of project success and the specifics of the role and relationship to the project of the individual as an important issue to be further understood. There is a lack of project management literature with relation to the goals and success criteria, as perceived by the public project manager, who is situated between the influence of his own political oriented organization and the commercial contractors. The knowledge gap on the success criteria of this public project manager adds to the incomprehension and lack of communication between public and private parties when executing a project together.

5.2.2 Cultural dimensions

Among all its various definitions, culture is seen as the representation of the shared values of a community. Cross-cultural studies seek to extract these shared values. The shared values reveal parts of the mental programming of a person, which defines attitude and behavior. Values are seen as *"broad tendency to prefer certain states of affairs over others"* (p.10, Hofstede and Minkov, 2005). Kluckhohn (1951), cited by Hofstede (p. 5, 2001), defined culture as *"patterned ways of thinking, feeling and reacting, acquired and transmitted mainly by symbols, constituting the distinctive achievements of human groups, including their embodiments in artefacts; the essential core of culture consist of traditional ideas and especially their attached values."* Following this definition national culture influences the perspective on a subject and the value attached to certain criteria that can be used in measuring the dimensions of the subject. Differences in valuing project success can result from different definitions and perception of project success by respondents from different countries (Chou et al., 2013; Pereira et al., 2008). The possible influence of national culture on the perception of project success is recently addressed as an interesting topic for research (Mir and Pinnington, 2014).National cultures were distinguished and described throughout the literature based on the measurement and classification of values. Cultural dimensions (Hofstede, 2001) are clusters of interdependent values bound by some similarity, or aspects of culture that can be measured along different cultures, as ways to respond to universal problems of society. This paradigm was founded by Hofstede in the 1980's, based on a large empirical study via a questionnaire, performed on IBM employees from 50 countries. He conceptualized the results of factor analysis by defining initially four cultural dimensions: Power distance (linked to inequality), Uncertainty avoidance (linked to dealing with uncertainty), Masculinity/ Femininity (emotional gender roles) and Individualism/ Collectivism (linked to interpersonal relations). In later versions, he added Pragmatism (linked to long or short term orientation), and, based on Minkov's study, he recently integrated Indulgence/Restraint. Succeeding his work, other scientists either introduced new cultural dimensions, or described the same reality using different paradigms (Minkov, 2007). Many of these are strongly related to Hofstede's dimensions (Inglehart and Baker, 2000; Minkov, 2007; Schwartz, 1999; Stumpf, 2011). Although Hofstede's data can be criticized on its age and lack of national representativeness (IBM employees), the

contribution to cross-cultural studies is acknowledged widely in this field of research. Hofstede's theory is widely spread and acknowledged, there are rich literature sources and, over time, the validity of these dimensions has been confirmed by many studies (Oudenhoven et al., 2007).

5.3 Research

5.3.1 Q-methodology

To close the gap in literature on success views of the public project manager, a first step was taken by Koops et. al (2017) who conducted a research using Q-methodology on public project success in The Netherlands. Q-methodology is a method that can be used for studying subjectivity (Brown, 1980; Exel and Graaf, 2005; Schmolck, 2012; Webler et al., 2009). Respondents are asked to rank a number of success criteria in the Q-sort – the main tool in Q- methodology. Researchers present respondents who match pre-set conditions, a list of elements on the topic and ask them to rank these elements in a ranking sheet provided by the researcher. The ranking sheet is ordered from very relevant to not relevant. This prioritization brings about their subjective view on the subject. During and after the Q-sorting process respondents are asked to explain their choices, especially related to the highest and lowest ranked criteria. The answers are used for the qualitative interpretation of the perspectives.

Table 5-1 Q-sample of success criteria extracted from Koops et al. (2017)

No.	Criterion*
1	Delivered on time
2	Efficient use of available resources
3	Fit for purpose
4	Learning opportunities for client organization
5	Personal growth and development
6	Profitability for contractor
7	Quality
8	Safety
9	Satisfies needs of project team
10	Satisfies needs of stakeholders
11	Satisfies needs of users
12	Within budget
13	Effect on the professional image of client organization
14	Good working relationship with contracting partners
15	Impact on the environment, sustainability
16	Right process is followed
17	Continuation of client organization
18	Project specific political or social factors
19	Satisfies needs of shareholders

* For definitions of terms as presented in the interviews see Appendix II

To frame the success criteria of public project managers we used a Q-sample of 19 criteria as shown in Table 5-1. This set is based on extensive literature and some test interviews (Koops et al., 2017). This set of criteria was used in The Netherlands and is now used to frame the views on public project success in Sweden, Finland, Denmark, Belgium and the United Kingdom.

Researchers provided the criteria on cards and the ranking sheet (Figure 5-1). Respondents were asked to rank these criteria from -3 (least important to determining project success) to +3 (most important to determining project success).

Figure 5-1 Ranking sheet

least important in determining project success   most important in determining project success

| -3	-2	-1	0	+1	+2	+3
criterion	criterion	criterion	criterion	criterion	criterion	criterion
	criterion	criterion	criterion	criterion	criterion	criterion
		criterion	criterion	criterion		
		criterion	criterion	criterion		
			criterion			

5.3.2 The assumed influence of culture

When people are asked to give their view on a subject, their culture penetrates into the process as it shapes their internal frame of reference. Q-methodology is, as mentioned, a method for studying subjectivity. In this research we presumed that cultural factors can influence the ranking made during the sorting. Four dimensions of Hofstede's theory are assumed to be of influence in valuing project success criteria: power distance, masculinity, uncertainty avoidance and pragmatism (long term orientation). These four dimensions show large variations among the target countries (Figure 5-2).

The respondents originate from countries from the same region, North West Europe., but the cultural scores of the countries in the research are not as comparable as might be expected from their geographical position. Comparing the county scores of Spain, Italy, Canada and South Africa with the countries in our research we see that the scores of these countries are

between the scores of our countries on the dimensions *Power Distance, Masculinity* and *Uncertainty avoidance* (geert-hofstede.com). Also in *Pragmatism* that is the case, accept for Argentina. But the difference in score between Argentina and Denmark is on this dimension is much smaller than the difference between Belgium and Denmark.

Figure 5-2 Target country scores on cultural dimensions of Hofstede (geert-hofstede.com)
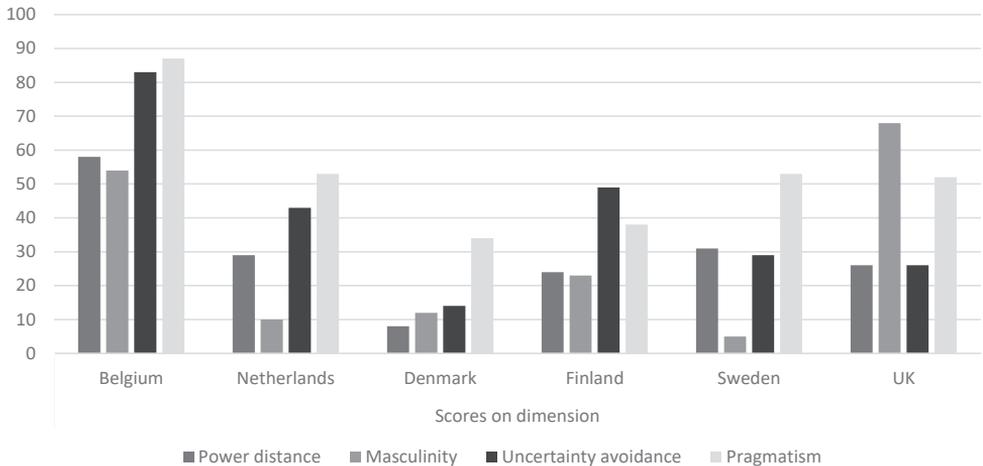
Based on the identified success criteria and Hofstede's cultural dimensions differences are expected in the ranking of the success criteria by the respondents originating from their national value frame. In general - without looking at a specific criterion or dimension - difference can be expected between project managers from Denmark and project managers from Belgium. As Figure 5-2 shows, the scores on all dimensions are far apart. The dimensions are briefly explained (geert-hofstede.com), including their possible influence on the success criteria:

- **Power Distance** *"The fundamental issue here is how a society handles inequalities among people. People in societies exhibiting a large degree of power distance accept a hierarchical order in which everybody has a place and which needs no further justification."* In the ranking, differences can be expected for instance for the criterion *good working relationship with the contractor.* Based on the country scores of Denmark and Belgium it could be expected that the Danish project managers value this criterion higher than the Belgians.

- **Masculinity** *"The masculinity side of this dimension represents a preference in society for achievement, heroism, assertiveness and material rewards for success (competitive oriented). Its opposite, femininity, stands for a preference for cooperation, modesty, caring for the*

weak and quality of life (consensus-oriented)." According to Hofstede Belgium and UK have more masculine oriented societies, where Sweden and The Netherlands are more feminine oriented. Project managers from feminine countries are expected to rank criteria that refer to the satisfaction of other groups (stakeholders, shareholders, users and even their team) higher than project managers from more masculine countries. So considering this dimension, Belgian and British project managers might respond similar, whereas the Swedish, Danish and Dutch project managers are expected to score at the opposite side of this dimension.

- **Uncertainty Avoidance** *"The fundamental issue here is how a society deals with the fact that the future can never be known: should we try to control the future or just let it happen? Countries exhibiting strong UA-index maintain rigid codes of belief and behavior and are intolerant of unorthodox behavior and ideas."* Again, Denmark scores low on this dimension, compared to Belgium and in this case Finland. Based on these differences we expect Belgian and Finish project managers to highly appreciate the *right process followed* and rank this higher than project managers from Denmark.

- **Pragmatism** *"In societies with a normative orientation most people have a strong desire to explain as much as possible. In societies with a pragmatic orientation, most people believe that it is impossible to understand fully the complexity of life."* In this dimension project managers of pragmatic countries (long term oriented), like Finland and Denmark, are expected to highly appreciate criteria like *learning opportunities for the client organization* and *personal growth and development.* The value of these elements goes beyond the delivery of the project.

On three dimensions Sweden and the UK are very similar, but on the dimension *Masculinity* their scores differ considerably. The way project managers from these countries value meeting constrains and long term effects, can reflect the similarity in *Uncertainty avoidance* and their *Pragmatic orientation.* On the other hand, the difference in the dimension *Masculinity* can drive these project managers apart because they value relationships differently.

This research is set up to explore different views on project success held by public project managers in different countries, but due to the personal approach, it also contributes to the clarification of individual links to societal cultures (indicated as direction for further research by Peterson 2007). Hofstede's dimensions are characteristics of societies, not of individuals. According to Peterson (2007) these *"characteristics mostly shape what people (...) find normal, but will have only a looser link to personal attitudes about what they typically experience"* (p. 373-374).

5.3.3 Research setup

To gain insight in the project success perception of public project managers in European countries, the Dutch research with 28 respondents (Koops et al., 2017) was extended to Finland, Sweden, Belgium, Denmark and the United Kingdom. The public organizations that are responsible for infrastructure in these countries participate in the NETLIPSE network. In total 50 new respondents were interviewed: 9 from Belgium, 10 from Finland, 11 from Sweden, 10 from Denmark and 10 from United Kingdom. Details about the respondents are given in Appendix IV. Most of the interviews were held face to face, some of them were setup by a video connection.

For those interviews which were held using the internet (Skype, Lync), an Excel-sheet was developed to sort the criteria by digital cards. After the sorting was finished and the respondent was satisfied that the Q-sort represents his perspective, he was interviewed about the decisions made - the respondent was asked to explain the statements that scored high and those that scored low. After the actual Q-sorting process additional questions were asked to collect information that was used to explain similarities or dissimilarities between respondents. The answers to the additional questions also provided a check: was the real opinion of the respondent revealed or was a merely socially desirable answer obtained? Results of the respondents were treated anonymously anyway.

5.4 Results

5.4.1 Quantitative results

A part of the respondents (8) did not end up in the final analyses because they actually did not meet the initial conditions of the P-set. The position of these respondents turned out to be another than the public project manager of the project, like the future owner (asset manager) or the portfolio manager. In analyzing the results with these respondents in the set we noticed that their point of view did make a difference in the ranking of the criteria. We excluded these from the final set because the differences were explainable from the deviation from the initial conditions and thereby following Brown who stated that *"experimental design principles are drawn upon for purposes of comparing a P set or set of persons who are theoretically relevant to the problem under consideration: the P-set is therefore more nearly theoretical or dimensional than random or accidental"* (p. 192, Brown, 1980).

To analyze the data PQ-method (version 2.35, March 2014) was used. The new data were added to the existing Dutch database and we analyzed the possible number of factors (groupings). *"There is no one objectively correct number of factors to use, and any number of factors*

will give you some insight into how people think about the issue. Nevertheless, there are several criteria that you can use to decide between different numbers of factors" (p. 31, Webler et al., 2009). These criteria are simplicity (fewer is better, but keep interesting nuances), clarity (minimize number of confounders – loading on multiple factors- and non-loaders – not loading on any factor), distinctness (low correlation) and stability (certain groups of people tend to cluster). Based on these criteria we choose to proceed with four factors – representing four groups of public project managers with similar ranking of project success criteria. Before a factor and its loadings can be accepted it has to meet criteria related to the significance of the loadings of the Q-sort and we needed to check the significance of the factors itself. To accept a factor it has to have at least two significant loadings and the cross-product of the two highest loadings on the factor has to exceed 2(SE)" (Brown 1980) All four factors were accepted (as elaborated in Appendix V).

From the complete set of 78 respondents, 26 respondents load on the first factor, 10 on the second, 5 on the third and 14 on the fourth. Two respondents did not load on any of the factors (non-loaders) and 6 respondents are so-called *con-founders,* which means they load on two factors without a clear preference for one of them (Table 5-2).

Table 5-2 Characteristics of the data processing

	Initial resp.	Excl. from P-set	Resp. on a factor	P1	P2	P3	P4	Non-loaders	Con-founders
Belgium	9	4	3	1	0	0	2	1	1
Denmark	10	1	7	3	0	0	4	1	1
Finland	10	1	9	8	0	0	1	0	0
Sweden	11	0	9	6	1	0	2	1	1
United Kingdom	10	2	6	6	0	0	0	1	1
The Netherlands	28	2	21	2	9	5	5	3	2
Former results									
Perspective A				*1*	*0*	*0*	*2*	*0*	*1*
Perspective B				*0*	*8*	*1*	*1*	*2*	*2*
Perspective C				*0*	*0*	*4*	*0*	*0*	*0*
Non-loaders				*1*	*1*	*0*	*2*	*0*	*0*
Total	78	10	55	26	10	5	14	7	6

Based on the national value frames as derived from Hofstede, these sets of respondents are expected to consist of project managers of countries with similar cultural characteristics. The majority of the respondents is loading on the first factor or *perspective* (P1). For Finland (8 out of 10), UK (6 out of 8) and Sweden (6 out of 11) it is the majority of project managers that load on this perspective. The cultural country scores of Finland and the U.K. are almost similar on the dimension *Power distance* (24 resp. 31). Furthermore 6 out of 11 respondents from

Sweden load on this factor. Sweden has also a similar cultural score on *Power distance* (31). Based on this dimension the small number of Dutch managers in this group is surprising, The Netherlands score on the dimension *Power distance* between the UK and Sweden (29). The grouping of Swedish and British project managers is also explained by their similar cultural scores on the dimensions *Pragmatism* (53 resp. 52) and *Uncertainty avoidance* (29 resp. 26). Again, if the cultural value frame is the binding factor, based on the dimension *Pragmatism* we should have found more Dutch project managers in this group as the country score is similar to Sweden.

The fourth perspective (P4) binds 14 public project managers. In this group five nationalities can be found, including two project managers from Belgium and four from Denmark. This is for both the Belgian as for the Danish project managers the majority of the respondents. Due to the small number of respondents in these groups, no thorough conclusion can be derived. Yet we remark that the Belgian and Danish project managers were not expected in the same group, because of their different scores on all cultural dimensions.

The second and third perspective only contain project managers from The Netherlands – one exception in P2 from Finland. This was not an expected result; the Dutch cultural scores are not extreme on any of the dimensions. Next to the nationality of the respondents, some other characteristics of the respondents and their projects were gathered: educational background, previous work experience, governmental level, contract type, budget, experienced complexity of the project and political sensitivity. We analyzed the spread of these features over the perspectives to see if there is an explaining variable for the found groups of public project managers. We performed a Kruskal-Wallis test to assess the significance of the observed distribution of features over the perspectives. The Kruskal-Wallis test is a non-parametric analysis of variance and can be performed on subgroups from the same sample (Field, 2013). Based on the Kruskal-Wallis test, governmental level, budget, educational background and level of technical complexity are identified as a significant explanation for the groups found. The number of respondents in some subgroups was too small to draw valid conclusions. Taking the number of respondents in each group into account, there are four remaining statistical relevant characteristics (Table 5-3, grey scaled values).

The majority of the first group (P1) is educated as civil engineer (85%) and has been working for both public and private organizations (58%). Most of these managers are in charge of a national project in execution phase with a relatively large amount of managers managing a project with a budget larger than 500 million euros (46% in this group compared with 32% of the total number of respondents).

Table 5-3 Significant outcomes from Kruskal-Wallis

Characteristic	Pairwise comparison	Sig.	Adj. sig.
Governmental level	P1 – P2	0.000	0.000
Budget	P1 – P2	0.005	0.029
Educational background	P1 – P2	0.008	0.045
Educational background	P1 – P3	0.002	0.011
Governmental level	P2 – P3	0.019	0.115
Governmental level	P2 – P4	0.011	0.064
Budget	P1 – P3	0.029	0.175
Educational background	P3 – P4	0.013	0.081
Technical complexity	P1 – P2	0.035	0.212
Technical complexity	P1 – P4	0.012	0.070

Each row test the null hypothesis that the *sample 1* and *sample 2* distribution are the same. The significance level is .05.

The majority of the project managers in the second perspective has always been a public serv-ant (60%) and is not a civil engineer but has some other educational background (for instance economics, urban planning or law). These managers are employed by regional or local govern-ment and their projects have a relatively small budget (< 50M EUR). All project managers have contact with the responsible politician(s) and classify their project high on external complexity (60%). Respondent_N15: *"Political pressure makes the project difficult. (...) It has been started up as a solution to a social problem."* The governmental level can be an explaining variable for this group, since the distribution is not the same compared to all other groups. Taking into ac-count the number of respondents per group, only the differences in spread between this group and the first group can be judged as significant.

Most of the project managers in the third group (P3) have always been in public service and none of them has an engineering education. Three (out of 5) are employed at national level, four have no contact with the responsible politician. The project manager that did have contact with his politician, was still in the tendering or pre-design phase.

Five projects in the fourth group (P4) were in the execution phase or completed, most projects (9) these project managers control were in the front end development phase (either designing, preparing permits or waiting for a decision). The number of projects in the front end develop-ment phase seems an exceptional high percentage, since in ratio between FED-phase and execution-completion phase is the other way around (14 to 5 instead of 24 to 39).

5.4.2 Qualitative results

The derived four factors or perspectives can be given meaning by analyzing the results of the sorting of the criteria (quantitative) and the comments of the respondents during the sorting and the follow-up interviews (qualitative). To support the analysis we divided the success crite-

ria into four groups (colors in Figure 5-3 to Figure 5-6), inspired by existing models (Al- Tmee-my et al., 2011; Baccarini, 1999; Howsawi et al., 2011; Shenhar et al., 2001; Shenhar and Wideman, 1996): project management success (light grey), product success grey) and organizational success (for project organization: black, for parent organization: white).

Perspective 1: The Conventional project manager

This perspective binds 40% of the respondents (of the valid Q-sorts), corresponding with 26 respondents. They rank the *iron triangle – in time, within budget, according to quality requirements* – in the top of the chart, supplemented by safety, see Figure 5-3. In the words of Respondent_S09: *"Safety first! Project has no legitimacy if we can perform on time and budget, but at the cost of employees' health or lives".* Project managers of all countries load on this factor. These managers conceive the triple constraint as an important part of their assignment. Respondent_S08: *"it is important to strengthen the organization's image – but we do that by time-cost-quality"*; Respondent_B02: *"the government, as shareholder, only cares about within budget delivery; if we manage that, they are happy"*; Respondent_D06: *"shareholders should be satisfied if time-cost-quality are fine".*

Figure 5-3 Factor scores of the Conventional project manager (perspective 1)
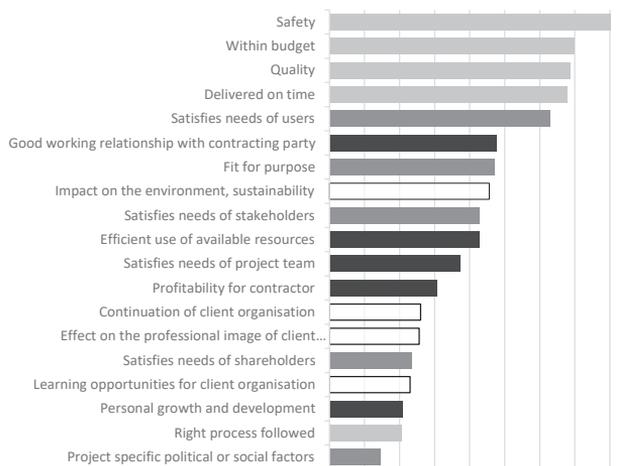
According to these project managers *project specific political or social factors* are the least important criteria to determine the success of their project. Respondent_F08: *"Political factors are important before the decision is made"*. Interesting is that most of these project managers do have contact with their political client (78%) but seem to manage this without trouble. Respondent_UK10: *"Politics are a tick in a box, as long as you deliver first rank items, it is ok"*. These managers also don not emphasize the importance of *following the right process.*

Their attitude towards rules is pragmatic. Respondent_N17: *"The process needs to be lawful and efficient, but you have to be careful that you do not focus too much on accountability."* Respondent_S09: *"Processes are schemes, a hygiene factor, but if there are better different solutions, why not go for it?"*

Perspective 2: The Product-driven manager

According to the managers in this perspective, project success is determined mostly by the end result of a project. They are very product-oriented: the value if the project is *fit for purpose*, measures up to *project specific political or social factors* and *satisfies the needs of users and stakeholders* (Figure 5-4). They strive to accomplish that *within budget* (most important), *on time* and *according to the quality requirements.* Respondent_N12: *"It is all about public support – you aim at improving the city, not just building a bridge."* The ranking of the criteria that connect project success to product success is in this perspective very different than in the first perspective: *fit for purpose* was ranked no_7 in perspective 1 and *project specific political or social factors* was ranked no_19 in perspective 1. This group contains 10 project managers. The vast majority of this group (9) are project managers from The Netherlands .

Figure 5-4 Factor scores the Product-driven manager (perspective 2)
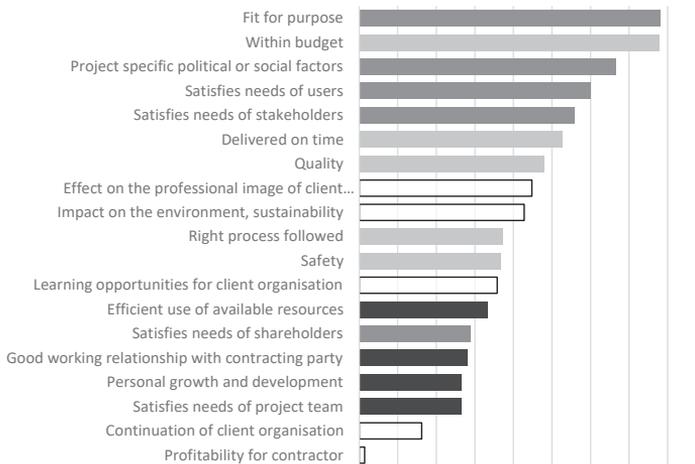
Respondent_N26 noted that the criterion *delivered on time* is actually of no interest to him as a public project manager. He stated that there are two important points in the project for the public project manager: the moment when execution starts and the moment of the project's implementation. *"The criterion delivered on time is merely important for the contractor. For the public project manager, the moment when the construction is brought into use is much more important – delivery is just the moment when the contractor gets the money."*

These project managers rank *profitability for the contractor* least important in determining the success of their project. This is in line with perspective 3 and 4 but very different with the ranking in the first perspective were this criterion ranks relatively high (no_12). The criterion *safety*, which was the first criterion in perspective 1, is ranked no_11 by these project managers. Respondent_N12 about safety: *"Responsibility of the contractor".*

Perspective 3: The Parent-oriented manager

This perspective is represented by the smallest group: 5 managers from The Netherlands load on this factor. The most striking criterion in the ranking of these managers is *effect on the professional image of the client organization.* Together with the high rank of *specific political or social factors* and *the right process followed* these are the most obvious distinguishing criteria (Figure 5-5). Respondent_N06 about *the right process followed: "It is the basis (...). Especially important if something goes wrong or legal procedures are started up: you win them if you have done everything by the book."* Respondent_N21 about *continuation of the client organization: "Important, especially in relation to the bearers of knowledge that you want to hold on to as an organization."*

From the iron triangle criteria delivered on time was ranked the highest (no_2). Only in perspective 4, this criterion was ranked higher, the previous two perspectives ranked this criterion relatively low. From the other criteria the low ranking of *satisfaction of shareholders* and *satisfaction of stakeholders* is worth mentioning. Respondent_N21 remarks: *"The stakeholders did have a sounding board [to express their wishes], but this was mostly to let them say their bit."* On the other hand, the satisfaction of the needs of users is ranked equally high as in perspective 1 and 2.

Figure 5-5 Factor scores the Parent-oriented manager (perspective 3)

Perspective 4: Manager with a focus on stakeholders

The second large group can be found in this perspective: 14 public project managers from all countries except UK – in total 22% of all Q-sorts. These project managers value both the *iron triangle* and the criteria that refer to the ***satisfaction of stakeholders, shareholders, political or social factors and users*** (Figure 5-6). In the words of respondent_N07: *"I have ranged the criteria of the iron triangle equally, all score +1: they are important, but if you steer performance towards those, you will forget important matters like stakeholders, shareholders, safety."* The importance of *timely delivery* of the project also seems to come from a client oriented attitude. Respondent_D04: *"shareholder/government needs prevail; it is the first project that this minister opens"* and Respondent_S03: *"this project comes 20 years late for the area's development; we need to finish on time for the community".*

Figure 5-6 Factor scores the Manager with a focus on stakeholders (perspective 4)
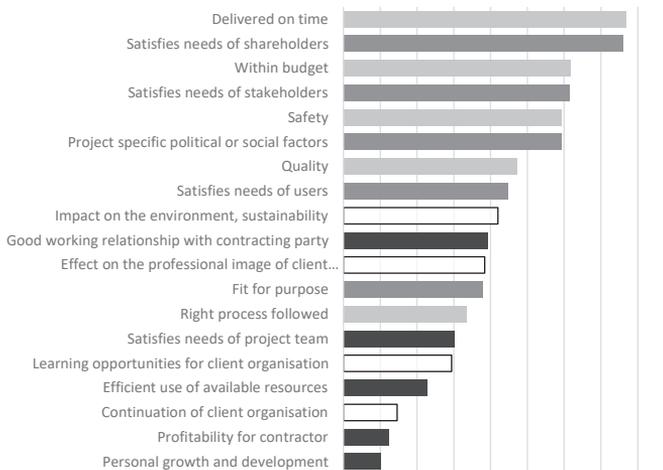
5.4.3 Similarities and differences amongst the perspectives

In order to analyze the similarities and differences amongst the perspectives, the factor scores (z-scores) and the corresponding position in the ranking sheet were compared, (Table 5-3 and Appendix VI). Looking at the overall dataset, respondents from all four perspectives agree on the lowest ranked criteria, *personal growth and development* and *profitability for the contractor.* Especially the last criterion was generously commented by the respondents. Respondent_D02: *"profits are not our issue – when you cut to the bone, we have a business relations with contractors."* Respondent_N08: *"Is its own responsibility, unimportant to us, but it seems that the contractor will not be making a profit here."* Respondent_N12: *"If necessary, they are allowed to make a profit.".* Respondent_S10: *"Profit makes the journey more easy,*

but is not crucial." A lot of project managers expressed their awareness of the fact that they were spending taxpayers money. Respondent_F05: *"There were discussions with contractors, regarding the money needed for extra works – we are talking about taxpayer's money."* The public project managers value this responsibility very high, which explains their restraining attitude towards *profitability for the contractor.* Interesting is the rank this criterion gets from the Conventional project managers (perspective 1); they ranked this criterion not very important for project success but also not very unimportant for project success. Compared to the other three perspectives this is a distinguishing rank.

The criterion *safety* is distinguishing for the first and the second perspective (Table 5-4). The Conventional project manager ranks this criteria much higher than the others where the Product-driven project manager ranks it much lower than the others. An explanation of this can be given by Respondent_N12 who stated that safety is the *"responsibility of the contractor."* The difference in opinion about this criterion can be well illustrated by comparing this statement with a statement of Respondent_UK02: *"We need to make sure everyone gets home safe every day."* The latter indicates a more leading, proactive attitude towards safety.

Table 5-4 Most disagreed upon criteria, with corresponding factor scores

Criterion	P1	P2	P3	P4
Personal growth and development	-1.05 (-2)	-.077 (-2)	-0.78 (-2)	-1.59 (-3)*
Profitability for contractor	-0.57 (0)*	-2.03 (-3)	-1.58(-2)	-1.48 (-2)
Safety	1.91 (3)*	-0.26 (0)*	1.17 (2)	0.87 (1)
Continuation of the client organization	-0.80 (-1)*	-1.29 (-2)	-0.07 (0)	-1.37 (-2)
Needs of shareholders	-0.93 (-1)	-0.66 (-1)	-2.00 (-3)	1.70 (2)*
Fit for purpose	0.26 (1)*	1.81 (3)*	-0.77 (-1)	-0.21 (0)
Specific political or social factors	-1.37 (-3)	1.23 (2)	2.00 (3)*	0.86 (1)
Influence on the professional image	-0.82 (-1)*	0.14 (0)	1.08 (1)*	-0.18 (0)
Needs of stakeholders	0.04 (0)*	0.69 (1)	-0.66 (-1)*	0.98 (1)

Corresponding position in the ranking sheet per perspective between brackets, * = distinguishing at P<0.01.

The criterion that is most disagreed on is *project specific political or social factors.* This is ranked least important by the Conventional project manager (P1) and most important by the Parent-oriented manager (P3). The Product-driven manager also considers this an important criterion and ranks it very high. Respondent_N06 demonstrated clear awareness of the specific factors: *"When the project was started up, the organization objectives (from the agenda 2012) were translated to project objectives."* But the disagreement might not be as big as it seems if we listen to Respondent_F08 who is a representative of the first perspective and stated: *"Political factors are important before the decision is made."* So it might be a criterion that loses its importance in the execution phase.

5.4.4 The iron triangle

From literature, we know the importance (although outdated as well) of the iron triangle (Atkinson, 1999; Chan et al., 2002; Shenhar and Wideman, 1996)). How do the criteria related to the iron triangle score in this research? None of the perspectives rank the iron triangle criteria "most important in determining project success" (rank '3' and '2' on the ranking sheet). In fact, considering project success, the four perspectives disagree on the importance of all three criteria. The criterion *within budget* is most valued by the public project managers. But for the Parent-oriented manager this is not as important for project success as for the other perspectives. This criterion is ranked '1' by these managers with a distinguishing low factor score (Table 5-5). For the 'project manager with focus on stakeholders' the criterion *delivered on time* is ranked highest. This criterion is less important for the Product-driven manager: although at an average rank '1', the factor score is distinguishing low for this perspective. On the third criterion of the iron triangle, *quality,* the Conventional project manager values this criterion distinguishing higher than the other perspectives. These managers rank this criterion '2' with an extreme high factor-score of 1.34. In the words of respondent_F05: *"Quality is crucial, the project will be there for the next 100 years".* The others rank this criterion more in the middle of the spectrum (rank '1' or '0').

Table 5-5 The iron triangle's factor scores

Criterion	P1	P2	P3	P4
Within budget	1.40 (2)	1.80 (2)	0.31 (1)*	0.99 (2)
Delivered on time	1.29 (1)	0.54 (1)*	1.45 (2)	1.74 (3)
Quality	1.34 (2)*	0.30 (1)	0.00 (0)	0.26 (1)

Corresponding position in the ranking sheet per perspective between brackets, * = distinguishing at $P<0.01$.

5.4.5 Relation of specific criteria to culture

This research is set up to explore different views on project success held by public project managers in different countries. Based on the country scores on Hofstede's dimensions, differences were expected in the ranking of success criteria (Section 5.3.2). The results of the q-sort show that the public project managers are spread over the derived perspectives. We also analyzed the positioning of certain criteria by the public project managers. Based on the country scores of Denmark and Belgium on the power distance index it was expected that the Danish project managers value *good working relationship with the contractor* higher than the Belgians. The individual rankings of this criterion do not show a difference between Belgian and Danish managers. In both groups this criterion is placed in the ranking sheet at position -1, 0 or 1. The country scores of Sweden and The Netherlands are more feminine where Belgium and UK have masculine oriented societies. Project managers from feminine countries are expected to rank criteria that refer to the satisfaction of other groups (stakeholders, sharehold-

ers, users and even their team) higher than project managers from more masculine countries. This is not supported by the ranking of the project managers. The *satisfaction of users* is even ranked highest (+3) by four managers from masculine countries. On the Uncertainty Avoidance index again Denmark scores low compared to Belgium and in this case Finland. The criterion *the right process followed,* which can be linked to the Uncertainty avoidance index, is positioned 0 or 1 in the ranking sheet by the Belgian managers. Danish managers mostly position this criterion at -2 of -1. The managers from the UK rank this criterion even lower (-3, -2). This is not supported by the Uncertainty Avoidance index of the UK. Project managers of pragmatic countries (long term oriented), like Finland and Denmark, are expected to highly appreciate criteria like *learning opportunities for the client organization* and *impact on the environment.* The value of these elements go beyond the delivery of the project. Indeed impact on the environment is ranked on the positive site of the ranking sheet by the Danish and Finish project managers (0, 1) where the others also rank this criterion at the negative site. *Learning opportunities* is valued equally by all managers (-2, -1, 0 – with 4 exceptions).

5.4.6 Implications of the results

The results of the Q-methodology show us that within a group of people from different countries, with the same position in the project, multiple perspectives exist. We have shown that researchers on the subject of project success and project success factors have to be very specific about the perception their objects of research have on project success. The perspectives seems to arrive from an internal motivation rather than external expectations or cultural influences and the results show that there are big differences on what a person is striving for. The results give reason to assume a change in priorities entering a new project phase, as we have analyzed that the fourth perspective (the Manager with a focus on stakeholders) is mostly held by managers in the front end developing phase. The absence of influence of the country culture on the prioritization of criteria, is supporting Peterson (2007) that the country characteristics of Hofstede have a looser link to personal attitudes.

5.5 Discussion

With Q-methodology the aim is to gain insight in the range of viewpoints, so the sample of persons that participate in the research can be small. No claims are made about the frequency of their occurrence amongst the general population. A respondent group of 20 to 40 people is very reasonable and provides a good foundation for factor analysis (Brown, 1980). The total of respondents in our study reaches this number (total of respondents in the dataset: 68), but the number of respondents per country is much lower. *"As a general rule, the Q sort is administered to persons who, on a priori grounds are expected to define a factor. Whether they*

in fact do so or not is an empirical matter brought to light by factor analysis." (p. 193-194, Brown, 1980). Because the participants per country do meet the preset conditions (organizational position, number of years in this position, contract type) their results are valid. *"What is of interest ultimately are the factors with at least four or five persons defining each; beyond that, additional subjects add very little."* (p. 260, Brown, 1980). Since at least 55 respondents loaded on our perspectives, these perspectives seem valid as well. Additional research could confirm the perspectives found.

The ranking of criteria forces respondents to choose between criteria, but the criteria can be related to each other. Respondents might value some criteria higher, but ranked them lower, simply because they ranked a related criterion already high and they had to make choices. A few quotes that illustrate this mechanism: Respondent_S08: *"It is important to strengthen the organization's image – but we do that by time-cost-quality"*, Respondent_UK10 "Quality and safety drive performance and put project on track with time and costs" and Respondent_B02: *"The government, as shareholder, only cares about within budget delivery; if we manage that, they are happy".*

We used Hofstede's theory to explore cultural influences in the management of public infrastructural projects. Though Hofstede did not suit as an explaining factor, other cultural theories or a historical analysis of the usage of project management methods might be helpful to explain and predict differences in the perception of project success. Further research is recommended. The explanatory variables as indicated in Section 5.4.1, such as educational background, project budget and former experience, should be taken into account when composing new research.

The aim of this research was to identify the main success criteria in the perception of public project managers. We took particular interest in this role because the public project manager functions on a crucial position at which he can actively influence the actual project result. We explored what the public project manager is striving for, but we did not include measuring if he succeeds. We recommend further research on the relationship between the criteria and the project results.

5.6 Conclusion

The performed research aimed at indicating the moist important success criteria in the general perspective of public project managers in different Western European countries. We identified four different perspectives on project success, each with their specific set of most and least

important success criteria. We named the perspectives after the characteristics found by analyzing the sorting and the comments respondents gave during the sorting. Though all public project managers consider the iron triangle criteria important, in none of the perspectives they are all ranked top 3. In one perspective *delivered on time* is considered most important, in another perspective *within budget* scores high. Several other criteria illustrate the differences of opinion within the four groups. Especially *safety, profitability for the contractor, needs of shareholders* and *specific political or social factors* are valued differently between the perspectives.

The first perspective focusses on the controllability of the process up to project delivery and handover as introduced by Munns and Bjeirmi (1996). These managers were found in all participating countries. In the opinion of the second perspective project success is when the project is *fit for purpose* and meets *specific political or social factors* within the given *budget*. These managers are found in The Netherlands and Sweden. A small group of Dutch project managers represent the third perspective. These managers favor *project specific political or social factors* above all, followed by *delivered on time.* The last perspective is that of managers who are balancing between *the needs of stakeholders, shareholders, users* and *specific political or social factors* and *the iron triangle criteria.* The majority of the Belgian and Danish managers load in this factor.

Perspective 2, 3 and 4 are in line with the findings of Baccarini (2001) where 42% of the respondents considered project success both project management success and product success (as in the result of the project). The results of our research show the diversity in this group – project managers emphasize specific elements of product success. In public private collaborative relationships in Large Infrastructural Projects, partners agree on project management success. The challenge is to understand each other's point of view on the importance of the specific elements of product success: *satisfies needs of shareholders and stakeholders, fit for purpose* and *specific political and social* factors.

The expected influence of national culture on preferences for certain criteria was not found. For 26 project managers with origin in all participating countries, who are united in the conventional project management perspective (P1) the most important criteria for success are *within budget, delivered on time, quality* and *safety.* Project managers from countries with a more feminine culture, Denmark, Sweden and The Netherlands are also found in the perspective with a focus on stakeholders. Although this is as we expected, the group of respondents loading on this perspective is too small to draw conclusions. The identified perspectives (groups) did not consist of project managers of countries with comparable scores on Hofstede's dimensions, thereby our findings support the statement of Peterson (2007) that the Hofstede dimensions only loosely link to personal attitudes. The results indicate the existence of a managerial

culture (perspective 1 and 2) or an organizational culture that can be of influence (perspective 3 and 4). Common values in the environment in which the project managers perform their daily activities can be an external factor of influence. Another explanation can be the influence of internal, personal values and the possibility that people with certain values tend to work for governmental organizations.

5.7 Acknowledgements

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Chapter 6 Exploring the influence of external actors

Abstract

Though different forms of public private partnerships exist, in the organizational structure of most forms a public and a private project organization can be derived, resulting in two collaborating project organizations. The literature on project management however mostly considers one project organization. The literature on public private partnerships considers the public part of the organization mostly as 'the client'. This research focuses on the relationships between public and private organizations: the two collaborating project organizations, the relationship with their parent organizations, and with external actors. Exploratory interviews in three cases uncovered five mechanisms leading to tensions between project partners: ambiguity, conflict of interest, triangular relationships, unclear purpose and organizational context.

6.1 Introduction

The term *public private partnership* is used for several contractual arrangements between public and private partners, each with different roles for both partners and different distributions of responsibilities (Beato and Vives, 1996; Child et al., 2005; Cruz and Marques, 2013; Ke et al., 2009; Kwak et al., 2009). Based on surveys on public and private practitioners, factors are revealed that influence the effectiveness of the cooperation and the success of the project (Black et al., 2000; Chan et al., 2004a; Hwang et al., 2013; Jefferies, 2006; Zhang, 2005). After studying the literature on different public private project arrangements Kwak et al. (2009) conclude that the factors can be organized in four groups; (1) the selection of an appropriate concessionaire, (2) an appropriate allocation of risks, (3) a sound financial package and (4) a competent government. The fact that the alignment with the parent organization is a factor of influence for project performance is known from research on project management (Chan et al., 2004b; Cox et al., 2003; Meredith and Mantel Jr, 2009). Literature on public private partnership, however, is not clearly addressing the influence of the public parent in public private project arrangements. For instance in the roles Kwak et al. (2009) mention to define a competent government (in their 4th group of influential factors) no distinction is made between direct and indirect involvement in the project organization. In many articles on public projects the public involvement is addressed as the *client* or *owner* suggesting a passive role in the project (Aarseth, 2012; Black et al., 2000; Chan et al., 2004a; Doloi, 2012; Holt and Rowe, 2000; Smyth and Edkins, 2007; Winch and Leiringer, 2016). The main task of the public involvement would be ensuring favorable conditions for the collaborative arrangement (Figure 6-1a).

In Europe Infrastructure projects are built through public private partnerships in which the public partner is acting in an active project management role (Hertogh et al., 2008; Hertogh and Westerveld, 2010). The direct public involvement is organized in a public project delivery organization (Figure 6-1b). To deliver the project to the parent organization the public delivery organization is collaborating with consultants and contractors in a combined project organization (Figure 6-1c). From the perspective of the project manager of the public project delivery organization the parent organization is their client (Hertogh and Westerveld, 2010; Koops et al., 2016; Koops et al., 2017). The preparation and execution of infrastructure projects can take several years and the client's requirements can change over time (Bosch-Rekveldt, 2011; Hertogh and Westerveld, 2010; Parfitt and Sanvido, 1993; Pinto and Slevin, 1988). As client satisfaction is important to the public project manager (Koops et al., 2016; Koops et al., 2017; Verweij, 2015), the relationship between the project organization and their parent organizations can be stressful (Hertogh and Westerveld, 2010).

a. Public – private partnership, owner contractor relationship, public private collaboration

| public organization (the client) | ←——→ | private project organization |

Beate and Vives (1996), Bresnen and Marshall (2000), Cruz and Marques (2013), Dulaimi *et al.* (2007), Hwang *et al.* (2013), Kwak *et al.* (2009), Ng *et al.* (2013), Smyth and Edkins (2007), Van Marrewijk (2005), Zhang (2005)

b. Introduction of the public delivery organization

| public parent organization | ←→ | public project delivery organization | ←——→ | private project organization | ←→ | private parent organization |

Hertogh *et al.* (2008), Hertogh and Westerveld (2010), Winch (2013)

c. Combined project organization

| public parent organization | ←→ | public project delivery organization | ←→ | private project organization | ←→ | private parent organization |

Focus in this research.

The combined project organization is operating in a dynamic network environment (Belassi and Tukel, 1996; Chan, 2001; Davis, 2014) of organizations and stakeholder groups (Figure 6- 2). This dynamic environment forces the project organization to constantly find a balance between product criteria to satisfy the client, stakeholders and users and project management criteria to meet the given constraints (Cooke-Davis, 2002; Sanvido et al., 1992). Every discussion about this balance is a potential conflict between partners (Dille and Soderlund, 2011; Leufkens and Noorderhaven, 2011), and hence a potential risk for the project. The stressful relationship that the public project organization experiences, indicates that the parent organization is a disturbing factor in the cooperation in the combined project organization, while true teamwork and relational attitude are important conditions for a successful outcome (Suprapto, 2015). Literature on the influence of this stressful relationship on the collaboration between public and private partners in the combined project organization is limited though. Therefor this research focuses on the influence of external actors on the relationship between public and private partners in the combined project organization. External actors are defined as actors from outside the project organizations. In research on project organizations only limited attention has been given to the interfaces between the temporary project organization and the permanent organization that configures the project (Winch, 2013). The central question in this part of the research is 'How do external actors, especially the public parent organization, influence the combined project organization?'.

The aim of the analysis performed in Chapter 6 and 7 is to understand the influences from surrounding organizations on the combined project organization. Based on this, improvements

can be identified in order to increase the efficiency and effectiveness of the cooperation in the combined project organization.

Figure 6-2 Actors surrounding the public private project organization
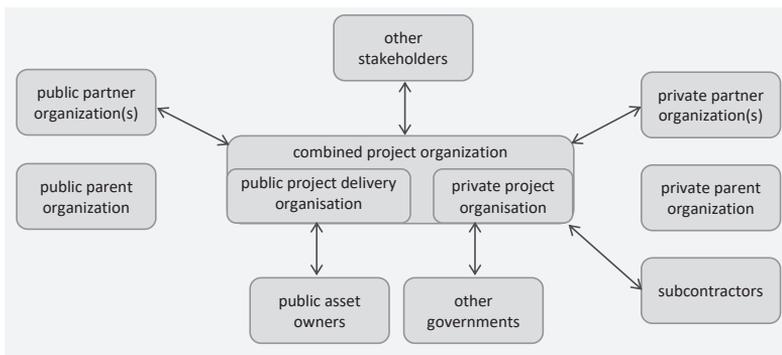
6.2 Literature overview

Numerous publications related to factors for project success identify the interaction with the environment as an important factor (see for example Chan et al., 2004a, Sanvido et al., 1992). However, the perspective from which the factors are identified, is either unclear or different perspectives are included in the outcomes. For this study the perspective is relevant in the approach of external influences. Hence, we investigated literature on collaborative and inter- organizational relations. As we want to identify not only the relations, but on a deeper level the influence of these relationships, we turned to literature about (tensions in) professional relationships.

6.2.1 Cooperative activities with surrounding actors

The revised definition of *project* by Turner and Müller (p. 7, 2003) puts more emphasis on the project team as an organization: *"a project is a temporary organization to which resources are assigned to undertake a unique, novel and transient endeavor managing the inherent uncertainty and need for integration in order to deliver beneficial objectives of change".* Considering this definition of a project, the network of the combined organization consists of at least four organizations: the public parent organization, the public project organization, the private parent organization and the private project organization (Figure 6-2). The number of organizations in the network is even more when the parent organization consist of several 'parents', like in a private consortium or with multiple commissioning in the public organization. The organization of cooperative activities can assume many forms (Child et al., 2005). At one end of the spectrum the hierarchical lines of a so-called 'conventional' organization dominated by one partner

can be recognized. At the other end a network approach is presented, in which collaborative partners are linked together by a variety of relationships (Child et al., 2005; van Marrewijk, 2005). Sydow and Windeler (1998) examined inter- organizational issues and recommended investigation on how structures develop from actions and how actions flow from structures. In other words, actions primarily taken from a position in the hierarchical organization model create a network that can be used again for actions. Individuals forming the project organization are the main source of information for the course of action (Packendorff, 1995).

From an organizational perspective based on hierarchical lines, the connections of individuals in the project organization relate to the responsibilities of the organization that the individuals are part of, and the specific organizational task(s) the individuals have. To clarify involvement, tasks and responsibilities in an organization, the RACI-method can be used, mentioned in for instance the PMBOK (PMBOK®, 2008). RACI is an abbreviation of Responsible, Accountable, Consult and Inform and is sometimes spelled RASCI, with the S of Support added (Cabanillas et al., 2011). This method helps people in an organization to identify explicitly the differences in the contribution people have in organizational processes. In the RA(S)CI definition the Responsible person(s) does the work to achieve the task. The project manager is Responsible for the project (Gul, 2012; Jones and Deckro, 1993; Meredith and Mantel Jr, 2009). In large projects the Responsibility is covered by the project management team (Prakash Prabhakar, 2008). The Responsible actors can delegate their tasks to others, then the term *Support* is used. The person that is ultimately answerable for the correct completion of the task or deliverable, is indicated with the term *accountable*. Instead of *accountable* also *approver* or *approving authority* is used. The accountable person must approve work that the *responsible(s)* provide. The consulted persons are typically subject matter experts, whose opinion is sought by others. Persons who are informed about the project are kept up-to-date on progress on tasks or deliverables. By responsibility-charting the activities and responsibilities from different people involved in the processes can be made clear. Responsibility-charting connects activities to each other. These different interactions form the actual network of relationships in the project organization. This network of relationships can provide valuable insights in inter-organizational relationships (Child et al., 2005). In order to understand the nature of interaction among participating individuals in a specific project context Cicmil and Marshall (2005) state that not the contractual, but the situational aspect of relationships is of interest when studying the complex interactions among participating actors.

Limited awareness or understanding of responsibilities or interests of other persons or other organizational units can lead to tensions (Sy and Côté, 2004; van Marrewijk, 2005). The importance of understanding tensions as being located at several levels of activity is emphasized in literature (Bresnen and Marshall, 2000; Cicmil and Marshall, 2005; Holt and Rowe, 2000). Tensions are framed as problems in terms of managerial differences of opinions for preferred

action in a given situation where co-existing but different arenas for action are leading to dead-lock or conflict (Arvidsson, 2009). Tension can stimulate or frustrate the involved team and the cooperation between people (Arvidsson, 2009; Gul, 2012; Jones and Deckro, 1993) and when underestimated or neglected tension can lead to conflict (Child et al., 2005; van Marrewijk, 2005). Tension can even lead to frustration within departments of the parent organization and through that, have influence on other projects (Gul, 2012). Tension that arises between parent and project organization can be noticeable in the project organization through individual actions. Tension on the interface between the parent organization and the project organization can flow through the project organization to the project partner (Figure 6- 2).

Though much of the literature cited above is based on individual (often mega-) projects or specific relational situations (alliances, procurement phase) we notice that for the understanding of inter-organizational relationships individual actions in the personal networks are of interest to better understand the influences people experience.

6.2.2 Influences on the combined project organization

All actors that cannot be disregarded while developing the project (Bryson, 2004) or all individuals or groups that have a special interest in the project or are affected by the outcome (Meredith and Mantel Jr, 2009) are indicated with the term *stakeholders.* To ensure the success of the project a wide range of stakeholders' interest and demands need to be considered in managerial decision-making (Aaltonen, 2011; Hertogh and Westerveld, 2010). Depending on whether it is defined from public or private perspective, the definition of *stakeholder* differs in the literature. In broad sense, the term *stakeholder* can include senior management, office staff, the project owner, consultants, project team members, subcontractors, suppliers and various user stakeholder groups (Bakker et al., 2010; Dulaimi et al., 2007; McLeod et al., 2012). Some stakeholders do not have a direct influence on the project, but they can have an indirect influence. They can express their opinion to politicians, journalists or in official legal procedures (Hertogh and Westerveld, 2010). Aaltonen (2011) distinguishes internal and external stakeholders. In his definition internal stakeholders are member of the coalition and, according to Aaltonen, support the project. For public management a wide interpretation of stakeholders is advised as it reflects the essence of democracy and social justice that anyone can have influence (Bryson, 2004).

To ensure a successful outcome, the project management team must manage the influence of the various stakeholders. In the previous section we concluded that for the understanding of inter-organizational relationships individual actions in the personal networks are of interest to the understand the influences people experience. The people functioning in the project management team are responsible for identifying and communicating with all stakeholders

surrounding the project in order to determine the project requirements and expectations (Aaltonen, 2011; PMBOK®, 2008). Van Marrewijk et al. (2008) recommend an internally focused, contextually-grounded view on project practices. According to them the failure of a project (in terms of budget overruns and delays) should be seen as the result of normal practice of professionals operating with limited knowledge, but influenced dramatically by a range of ambiguous and uncertain external and internal forces (Van Marrewijk et al., 2008). Different values, interests, needs, and expectations become relevant to particular interpretations depending on the social, economic, historical, and organizational context in which a project is executed (McLeod et al., 2012). Therefor the individual level for research on the influence of external influences on the public private collaboration in the project is the project management team.

Based on their findings in two megaprojects, Van Marrewijk (2007) argues that *project managers are trying to create some sense in contexts of different and variable rationalities and relying ultimately on documents with variable interpretations, incomplete data and many opportunities for gaps to arise between talk, actions and decisions* (p. 579,(Marrewijk, 2007). Jones and Deckro (1993) studied project management conflicts within one-organization and indicated four sources of conflict and four types of conflict leading to sixteen possible sources of tension (Jones and Deckro, 1993). Based on the above we argue that tensions stemming from different realities and different responsibilities are entering the combined project organization every day. These tensions are a potential threat for the successful outcome. Our study aims at identifying the structural elements of tension originating from the specific organizational context and the characteristics of infrastructure projects.

6.3 Case study

6.3.1 Case study setup

For this research a multiple case study is performed, in which the project organization is the embedded unit of analysis (Yin, 2013). In three cases the combined project organizations are studied. The criteria to select the projects were scope, contractual arrangements and level of government. The scope of the selected projects involves the (re)construction of a road with several supporting constructions. In two projects building a tunnel is part of the scope. By selecting cases with a comparable scope the licensing procedures contain similar elements. The private involvement in the three projects is arranged by a design and construct contract. Hence project phases in which the cooperation is operationalized are similar. The outcomes of the research on success perspectives held by public managers (Koops et al., 2017) indicate that the influence of the parent organization is different whether the public project manager acts on local, regional or national level. Therefore projects commissioned on different public

levels were selected. The selected projects are initiated by the local (Case I), regional (Case II) and national (Case III) government.

In social science the collective target in a multi case study is called the *quintain*. *"The quintain is an object or phenomenon or condition to be studied"* (p 5., Stake, 2006). The quintain is the umbrella for the cases studied and needs to be generic. The quintain in this multi case study is *'the relationships held by the project team'.* As the object of the research in each case is the same, the cases are categorically bound together (Stake, 2006).

Both public and private project managers are asked for their cooperation in this research. The interviewees are the team members who are considered part of the project management team by the project manager. In Social Network Analysis (SNA) this is indicated as the ego-centric approach, with the project manager as the starting point. This resulted in 26 interviews. By interviewing core project team members indicated by both the public and the private project manager the network of the core of the project organization is mapped. In Case I three persons of the public project team are interviewed and two persons of the private project team. In Case II next to the public project manager five people of each project team are interviewed. In Case III five people of the public project management team are interviewed and six people of the private project management team. The interviewees are Responsible for specific sub-processes in the project organization. To see what links the core of the project organization to the environment, interviewees are asked with whom they had contact. In this research the term actor is used for the mentioned contacts. For each actor the interviewee is asked to specify the purpose of their contact and encouraged to elaborate on their assessment of the contribution to the project. Following the RA(S)CI-method the project management team is Responsible for the project. The possible purposes of the relationship with actors are Accountability (Approver), Support, Consultation and Inform. For each actor the role description (who), and the purpose of the relationship (why) were noted in the interview. After the explanation of the contribution of the actors, the interviewees were asked to capture the nature of the contact explicitly (positive, negative or both) and the effect on the project (positive, negative or neutral). These answers were used in the SNA and the nuances the interviewees mentioned were used in the cross case analysis.

The interviews of the first and second case were held just after the project was delivered. The interviews of the third case were held halfway the execution phase.

6.3.2 Methodology
Studying projects as action systems means studying contacts, ties, connections and attachments that relate one individual to another (Packendorff, 1995; Sydow and Windeler, 1998).

The relations are not the properties of individuals, but of the relational systems of individuals built up from connected parts of interacting people, the method appropriate for analyzing relational data is that of social network analysis (Scott, 2013; Wasserman and Faust, 1994; Winch, 2013). In social network analysis the relations are treated as expressing the linkages that run between individuals. Describing network structures opens the possibility to investigate relational patterns. Although from different approaches of social network analysis different values can be assigned to positioning the outcomes. The similarities make clear that social network analysis can be seen as a comprehensive approach to the relational features of social structures.

Nowadays social networks are associated with networking sites or services such as Facebook and LinkedIn. The idea is indeed based on social network research conducted by Stanley Milgram (1967). Social network research is the domain of social sciences and anthropology and was already conducted from the middle of the previous century. The introduction of the computer enabled to process much larger amounts of data and also introduced digital data from communication systems like email, phone records, etcetera. In essence social network analysis is still about mapping the connections between people or groups in social systems (McCarty and Molina, 2015). Generally, research in social networks looks at a lot of data from interviews or communication systems. In this research the object is a relatively small scale network. It is common when studying small scale social networks to follow a realistic approach to the boundaries of the network: identify those boundaries that are perceived as real by the participants and correspond to the actual boundaries of organizations (Scott, 2013). The identification of a boundary is the outcome of a theoretically formed decision about what is significant in the situation under investigation. For this research the positions of interest are those of the public and private project management team; the boundaries of the analyzed network are formed by their contacts. The performed research is an ego-centric network study and started with the identification of the public and private project manager. The study was expanded with the contacts they identified as the project management team.

An often used supporting element in social network analysis is the sociogram. A sociogram was developed by Moreno in the 1930's and shows in a graph individuals as nodes (points) and relationships as lines between the nodes. Two nodes are connected if they regularly interact with each other in some way. A sociogram allows researchers to visualize the channels through which, for example, information flows from one person to another and through which one person can influence another. It helps to reveal network structures, sub-groups and the location of actors in the network. Using the sociogram it is possible to study who is in the core of the network, and who in the periphery. The sociogram can be used to study several features like the centrality of actors, boundaries, information channels and reachability. The centrality of particular nodes can be considered and the extent to which a whole network has a central-

ized structure. Both density and centrality are aspects that express the compactness of the network. Density describes the general level of cohesion in the network. Reachability refers to how easy it is for people to contact one another through a limited number of steps: or how easy it is for ideas to be diffused through the network. For analyzing social networks a lot of software packages are available, for instance Pajek, UCINET, KliqFinder or Visone. Based on the features of the networks, ego-centered, small networks, and the purpose of using the software, Visone (version 2.13) is used to model the outcomes of the interviews. The interviewees, their contacts with characteristics of both the contacts and the relationships were imported in Visone.

6.3.3 Approach for the cross case analysis

Usually case studies are studies of particularization more than generalization (Flyvbjerg, 2006; Stake, 2006; Yin, 2013). Via cross case analysis we want to generalize the findings over the cases to be able to learn from them. Cross case analysis can only provide useful information to a limited extent. Based on the similarities between the projects a qualitative analysis of the interviews is considered valuable to see if certain patterns can be discovered: patterns that are related to the features of the project or project organization and have a specific influence on the cooperation between public and private partner. Performing a cross case analysis according to Stake (2006) data from the projects is compared with regard to the quintain. The procedure forces a systematic search for differences and commonalities in the cases (Figure 6-3) resulting in assertions that must be proven with evidence from the cases. In the procedure, binding elements and unique elements are searched for in order to get better understanding of the quintain, and also to be able to study it further. When issues are important to the quintain, you may assume a general value.

Figure 6-3 Cross-case analysis procedure derived from Stake (2006)
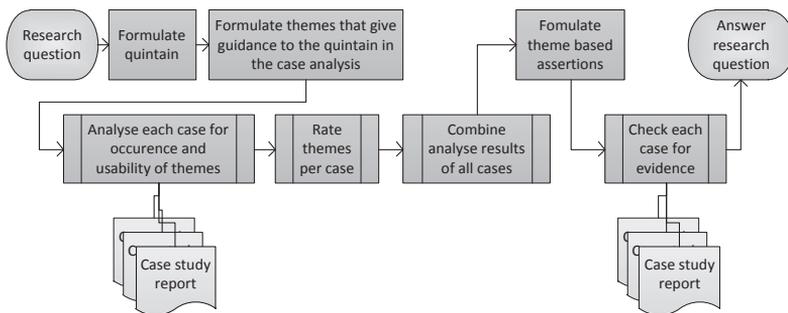
The quintain of this research is to investigate *'the influence of relationships on the cooperation in the project organization'.* For guidance through the interview data, with focus on the quin-

tain, we formulated eight themes (Nr. 1-8 in Table 6-1). For each case the SNA and the specific answers of the interviewees were analyzed focused on the themes. Based on the occurrence of each theme in each case we noted the prominence of the theme in the case. We analyzed the data of each theme with regard to the expected utility of the theme in the cross case analysis. While analyzing the cases additional findings and unusual situations were found. These lead to a few new themes (Nr. 9-12 in Table 6-1), which were also explored systematically in the other cases. Next, each theme is rated for all cases (Table 6-1). Occurrence in three cases with solid supporting evidence was ranked *High*, occurrence of the theme in two cases or with thin evidence was ranked *Medium.* Note that we did not rank *Low,* which can be explained by the fact that the themes were formulated with general knowledge of the interview results. Based on the outcomes of these steps assertions which support the understanding of the quintain are formulated. These assertions contribute to answering the research question. Each assertion has a single focus, an orientation for understanding the quintain and evidence to support it (p. 71, Stake, 2006). In the following sections the derived assertions are explained, supported by evidence from the cases.

Table 6-1 Rating of the themes in the cases. Themes 1-8 are based on the quintain, themes 9-12 are added based in the data gathered.

	Theme	Case		
		I	II	III
1	To what extent is the government connected to the project organization?	H	H	H
2	What is the purpose of the contacts (relationships) the project management team holds with the government	H	H	H
3	What is the reason the project management team classifies relationships positive?	H	H	H
4	What is the reason the project management team classifies relationships negative?	H	H	H
5	What is the link between the nature of the relationship and the effect on the team?	M	M	M
6	Is there a relationship between the purpose of the contact and the nature of the relationship or the effect?	M	M	M
7	What is the influence of single held contacts in terms of their effect on the project or project management team?	H	H	H
8	To what extent the project management team has its focus outside the project?	H	H	H
9	What is the number of different organizations involved and percentage self-employed involved?	M	M	M
10	If multiple contacts relate to one node, do interviewees agree on the nature and effect?	H	H	H
11	What is the position of senior manager in relation to the parent organization?	H	H	H
12	What is the motivation of the senior manager to pay attention to external actors?	H	M	H

Themes 1-8 are based on the quintain, themes 9-12 are added based in the data gathered.
Ranking: H = high prominence and usability, M = medium, L = low

6.4 Results

In the performed cross case analysis we systematically looked for similarities in the actor system that contribute to explanation of the quintain, supported by evidence from the cases. Our research is set-up to improve practice, as Morris (2010) recommended, so while formulating the assertions we chose to stay close to the practitioners level (Morris, 2010). It shows that relations with external actors can lead to tension in the combined project organization in five ways (Table 6-2). Following the framework of Jones and Deckro (1993) we saw two types of tension *inter-sender,* where the expectations of one member of the person's role set are incompatible with the expectations of another member in the role set and *intra-sender* in which the expectations from a single role set member are mutually contradictory. In the following sections we present the assertions that reveal the sources of these tensions, with the supporting evidence from the interviews and the SNA.

The SNA included characteristics of the parent organization of the actors. In the analysis we displayed the characteristics separately in Visone. This view showed a large spread of the contacts in the public domain, often appointed accountable by the interviewees. The first three findings are derived from these relationships, appointing specific situations of *authority bifurcation* and *internal politics* as sources of conflict (Jones and Deckro, 1993). In the following section we will explain that the fourth and fifth finding (Table 6-2) originate from observations in interviews that were supported by SNA analysis of the links. They relate to the alignment of the involved organizations and *technical complexity* and *life cycle* as potential sources of conflicts (Jones and Deckro, 1993).

In Case I and III the main reason for the combined project organization to maintain contact with the public parent organization is the Accountability of the actor (Table 6-3). Analysis of the background of the actors who are held accountable in the public parent organization shows three different types of Accountability in the public organization: the accountability for delivering the project within given constraints, the accountability for current operations and the accountability for licensing procedures. The accountability for current operations is divided in the operation of specific assets (like traffic control systems), road maintenance and public space. Accountability for licensing procedures is further divided in different knowledge fields: construction safety, operational safety, (soil) pollution, archeology, et cetera. The accountable actors are representatives of different public departments with specific responsibilities that relate them to the project. This distribution of responsibilities within the parent organization is a potential source of tension in the public private project organization. The following quote from the project manager in Case III illustrates this: *"For the private party we are all part of the same parent company. While from our perspective it is a very different department where we – the*

public project organization – have no influence. It is for the private party sometimes unclear how responsibilities are divided in our internal organization".

Table 6-2 Derived assertions

	Causes	Current situation / Desired situation	Assertion
Accountability	1. ambiguous connection		The explicit distinction between a project responsible person at the owner-client, and the owner-operator in the parent organization contributes to the cooperation in the project.
	2. conflict of interest		Remaining distant from the authorization procedures by the public project organization to prevent conflict of interest has a negative influence on the cooperation in the project.
	3. triangular relationships		Separating the contractual responsibilities from the operationalization of agreements has a negative impact on the cooperation in the project.
Alignment	4. purpose unclear		Having a common view on the purpose of external relations has a positive impact on cooperation between public and private partners in the project.
	5. organizational context unclear		Clear lines of information, responsibilities and decision-making processes from the private project organization through the public project organization to the public parent organization contribute to the cooperation between public and private partners in the project.

Legend

- Parent organization, future owner and responsible for current operation
- Public project organization
- Private partner organization
- **B** Parent organization, licensing authorization
- **C** Owner of asset that is being influenced by the project (can be parent)

Table 6-3 Purpose of contact with the public parent organization

Case I		Case II		Case III	
accountable	67%	inform	71%	accountable*	43%
inform	33%	accountable	21%	inform	25%
consult	0%	support	7%	consult	18%
support	0%	consult	0%	support	14%

Percentage of the total number of contacts held by the interviewees
* Including actors with whom the purpose of the contact was to *prepare the decision* (11%). The interviewees indicated that their contact
  with these actors came from the fact that these actors informed a decision maker. The interviewees themselves had no direct contact
  to the ultimate decision maker.

The ambiguity in accountability is in line with earlier research (Hertogh and Westerveld, 2010; Klijn and Teisman, 2003). Further analysis of the large amount of different responsibilities in the parent organization revealed that the different forms of Accountability can lead to conflicts in the project organization. The first source of conflict was found between the responsibility for the execution of the project and the responsibility for the usage of the new and current infrastructure. The second source of conflict is typically for the public sector and relates possible conflicts of interest between the project interests and the public accountability in licensing procedures and permits. Within the public setting the public responsibility to monitor the legal frameworks and to carry out the law and regulations is a completely different responsibility than the responsibility for delivering the project within the given constraints. Regardless of the source, conflicts between public parent organization and public project organization can affect the private project organization.

In the following sections the derived mechanisms (Table 6-2) are further explained, leading to the derived assertions.

6.4.1 Ambiguous connection

The public parent organization is the owner of the current infrastructure and becomes owner of the new or renewed infrastructure. The project organization is responsible for creating the new (renewed) infrastructure. They relate to each other as *line* to *project*. Conflicts of interest between project and line organization are well known in matrix organizations (Arvidsson, 2009; Jones and Deckro, 1993; Kuprenas, 2003; Sy and Côté, 2004). In case of a combined project organization the private partner is becoming part of this conflict. In Case I (local level) the connection between line organization and project organization is the most clear. A specific actor was indicated by the public project manager of this case as the official principal from whom the public project manager received his assignment. In Case II (regional level) the project was that extraordinary for the parent organization that special organizational arrangements were made. The connection between parent and project organization was made at the highest political level (provincial executive). In Case III (national level) the connection between parent and

project is made at a specific department for projects in the parent organization. This organizational arrangement introduces an extra interface with the parent organization, next to line activities and licensing departments. Table 6-3 shows that the main reason for communication with the parent organization in Case III is decision-making. The following statement of the public project manager in Case III illustrates this observation. Explaining the purpose of two of his contacts he stated: *"Director X has to take decisions affecting the project. These are internal decisions that affect the project contract (time, money, scope) as opposed to Director Y taking decisions that pose a contractual amendment, within the limits of time, money and scope".*

Further analysis shows that fragmented project responsibility within the public parent organization does not contribute to cooperation in the project. It causes confusion and debate within and between project management teams. The assertion based on this reads positively formulated as follows: ***The explicit distinction between a project responsible person at the owner-client, and the owner-operator in the parent organization contributes to the cooperation in the project.*** Clear separation of the representation of owner-operator interest and project interests have to be visible to the individuals involved in the public and private project organization. This includes the organization at the strategic level of the project organization. The evidence to support this assertion contains both positive as well as negative examples from the cases.

In Case I both the public as well as the private project manager was positive about the actor of their counterpart at strategic level. Remarkably the own project management organization was not aware of this positive influence on their project partner, since these contacts were not mentioned by their own project organization.

The public project organization in Case II was organized at *arm's length* of the parent organization. Analysis of the contacts shows that the purpose of contacts is irregular in the second case, compared to the other two cases (Table 6-3). In the words of an interviewee in Case II: *"the emphasis is on informing the governmental network".* In the public project organization a project director was actively involved. The project director acted mostly in the processes towards external stakeholders, including the parent organization and supporting partner organizations. His involvement in these processes had a positive influence on both the cooperation as well as the project performance. In this case, fragmented project responsibility mingled with line responsibility, was also avoided by renaming and explicit positioning of the project board. The project management team used the term *coordination group* to appoint the representatives of the parent organizations involved and put more emphasis on the expected contribution to the project: coordinate the line activities to align with the project.

In Case III the negative side of unclear representation of the project in the parent organization was found. A specific example that illustrates this is found on the interface of the new and the existing traffic control systems. One of the interviewees mentioned that the traffic control system they were going to deliver properly according to the specifications, would not the fit with the existing system in the parent organization. The system the project was going to deliver, was consistent with a new system that should have been implemented in the parent organization in the same period the project was built. But the intended new situation in the receiving department of the parent organization was not achieved. The private project management organization foresaw a problem in delivering the project, but did not know where to address it.

In general the cases show that relationships between the parent organizations with the public or private project management team do not necessarily contribute positively to the project. But if relationships are maintained with a specific representative for the project, they seem to contribute to better cooperation and project results.

6.4.2 Conflict of interest

The appearance of tension originating from obtaining licenses was most frequent in the cases. In all cases negative effects were reported if the actor was accountable for a specific issue or asset in the projects. The approval of these actors resulted (direct or indirect) in a permit or license. In Case I this concerned safety issues. In Case II the most important permit was the opening permit, depending on acceptance of the safety control system. And in Case III these were the authorizations the project needed for approval of correct design and execution of specific sub-systems, for instance the ground water system (water permit) and the safety control system (opening permit).

The conflicts of interest caused by the differences in responsibilities in these licensing procedures are of a completely different order than the conflict described in the previous subsection. For the private partner the public project organization is part of the processes of obtaining the license. The involvement of the public partner can contribute to an effective process. For the public project organization their involvement in the licensing processes is a very sensitive matter, particularly the licenses issued by their own parent organization. All apparent conflicts of interest in the granting of the license should be avoided in the public domain. So the public project organization wants to be involved in these processes as little as possible. The public value *legality* competes with the commercial value *effectiveness* (Smit and Thiel, 2002). This observation leads to the following assertion: ***Remaining distant from the authorization procedures by the public project organization to prevent conflict of interest has a negative influence on the cooperation in the project.***

Supporting evidence for this assertion is found in obtaining a building permit in Case I and the opening permit for both Case II and III. The private project manager in Case I noted that the licensing authority did not know the public project manager, while he himself considered them colleagues. In Case III the relationship with the licensing authority was also indicated negative by two private and one public interviewee. The public interviewee mentioned that the trouble-some relationship with this stakeholder sometimes strengthens the relationship with the private partner (mutual opponent). Interviewee_4 in Case III: *"This relationship creates a lot of turbu-lence in the project and takes a lot of time and effort."* In Case II these relationships also exist, but the framing of their own position towards permits is different. Rather than position them-selves completely outside of the procedures, the public project management team positioned themselves in a facilitating and directing role. The fact that the public project organization of Case II was organized at *arm's length* of the parent organization made it possible for the public project organization to be actively involved in the process. Their involvement had a positive influence on both the cooperation as well as the project performance. In the interviews the interviewees of the public project management team showed great awareness of the influence of these stakeholders and the public project management team made organizational arrange-ments to have influence on the licensing processes as illustrated by the following example. An interviewee of the public project organization describes one of these assessors as a very pre-cise person. He let a specific person of his team accompany the private partner in this dossier so he could function as an intermediary between the private actor and the accountable actor (licensing officer). Interviewee_3 in Case II stated: *"The effort that was needed to prevent this issue to become disturbing for the project was disproportionate".*

6.4.3 Triangular relationships

The conflicts we are addressing in this assertion are conflicts with owners whose assets are affected by the project. In each project a situation was found in which the executional respon-sibilities and contractual relationships are divided between private project organization, public project organization and asset owner organization. The public project organization makes con-tractual arrangements with the asset owner about the changes needed caused by the project scope. For the execution of these agreements the public project organization depends on the private project organization. The private project organization, though, has limited influence on the asset owner because there is no direct contractual relationship. The asset owner can take advantage of the situation in which neither the public project organization nor the private partner is in the lead, causing tension in the project relationships. This observation leads to the following assertion: ***Separating the contractual responsibilities from the operationaliza-tion of agreements has a negative impact on the cooperation in the project.***

Evidence from the cases that supports this assertion can be found in all three cases. In Case I this can explicitly be seen in the relationships with utility companies and in Case II and III in the relationship with the future operational management division of the parent organization. This assertion is illustrated with findings from Case I. In this case both public and private project team expressed that important negative influence was coming from the utility companies (nodes 12 to 15 in Figure 6-4). The purpose of the contacts with these nodes was either supporting the project (S), consulting (C) to match the interfaces or deciding (A) in their own project. The relationship with the public and private project management team was negative (node 1, 4, 5). The effect of these relationships on the project was considered worse by the private project management team. They suffered from both delays in their activities as from complaints from residents along the project. The public project manager considered this mostly an operational problem, he classifies the effect neutral. For better understanding of this mechanism the external actors were asked to indicate their relationship with the project. The water supply company indicated that the project planning was not in line with their internal timeline. Interviewee_14: *"Internal procedures such as waiting for an approval for an assignment affected the overall schedule of the project."* The energy company mentions that their assets in this municipality are given special attention because of the poor soil conditions in this area. The energy company is discussing this with the alderman of the parent organization (connecting node 12 to node 38). The discussion is initiated during the executing phase of this case.

Figure 6-4 The effect of relationships on Case I
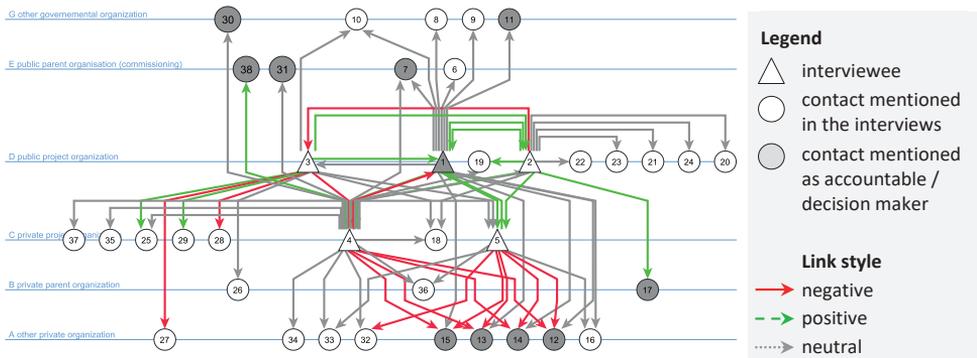
For some assets a specific department of the parent organization was accountable (current owner). In Case II and III the relationships with these departments were similar. The requirements for the assets are collected by the public project organization and translated into contractual requirements. The product the private organization delivers has to meet the require-

ments, but the tension is in doubt about the correct interpretation of the requirements. Even if the product meets the requirements, acceptance by the future owner is not directly guaranteed. The project management teams of both public and private project organization are struggling with the way the future owner(s) should be involved, without losing grip. Though the actual contribution of the actors to the project is similar in the cases, interviewees appoint the relationships differently. In Case II the future owner is framed as *supportive* by the interviewees, as in *this actor has to provide us with requirements,* these relationships are perceived less negative than those in Case III where the role of the future owner is framed as *the stakeholder has to accept the project* (accountable).

6.4.4 Purpose unclear

The next two causes of tension in the combined organization that are found in the cross case analysis are related to the (lack of) alignment between public parent organization, public project organization and private project organization. The first cause was found when analyzing the answers to the question of the purpose of the contact. Although the question 'what is the purpose of the contact' seemed easy to the interviewees, the answer was not easily given. Comparing the answers given by different interviewees pointing at the same contact, different purposes are mentioned. In some occasions this can be explained from the specific position and role of the interviewees, but in many occasions it is hard to explain. In Case III a lot of people are involved with an unclear view of the purpose or unclear responsibilities towards the project. In this case new people were added to the organization to help in the process of understanding each other. Extra resources, time and money were added to the combined project organization to frame the input of people with an unclear position and contribution to the project. The cases show that relationships with external contacts without a clear purpose have a negative influence on the project.

In the occasions a common view on the purpose of external relationships is found, the interviewees expressed a strategic approach to the contact(s). A public interviewee in Case I complimented a person from the private project organization on her contribution. Interviewee_01: *"A good, and in this case, a more than excellent, relationship with the actor enhances the effectiveness of action."* Another example is found in Case II in the relationship that is mentioned by a private interviewee with a person that is introduced by the public partner. This person is a former employee and had reached his pension already. The interviewee_08 stated *"The conversations with stakeholders we had together increased the joint confidence in the outcome".* The following assertion addresses this: **Having a common view on the purpose of external relations has a positive impact on cooperation between public and private partners in the project.**

An explanation of the involvement of several actors is found in the absence of the specific knowledge in the project organization (public and private). The cases demonstrate that the absence of the necessary knowledge in the combined project organization causes inefficiency and delay. This is caused by new actors that are getting involved when the appropriate knowledge is not present in the team. The actors get involved for their knowledge on a specific subject, which is the main subject from their perspective, but does not cover the whole project. Due to their specific knowledge, these actors have great influence on the trade-offs and the choices to be made on the project management team. In Case I this concerned an issue about polluted soil. Both the public as well as the private project management team were in contact with two specialists of the authorization department of the province and both added a team member to the organization. In these relationships a lot of negativity was found, caused by much debate due to professional disagreements. In Case III this mechanism was witnessed on three issues, leading to additional actors with specific expertise at three places in the network. In both cases the combined project organization had to explain the choices made to several actors in the parent organization to gain support for the project choices. Especially in Case III, a large project on national level, the organization of support in the parent organization by the public project organization was of major concern.

With this assertion we join Hinds and Weisband (2003) who stated that *"to have a shared understanding of the surroundings will enable people to predict the behaviors of the other project team members, reduce errors, misunderstandings and mistakes, and reduce frustration and conflicts such as organizational challenges"* (Hinds and Weisband, 2003). We argue that this shared understanding is needed within the combined project organization.
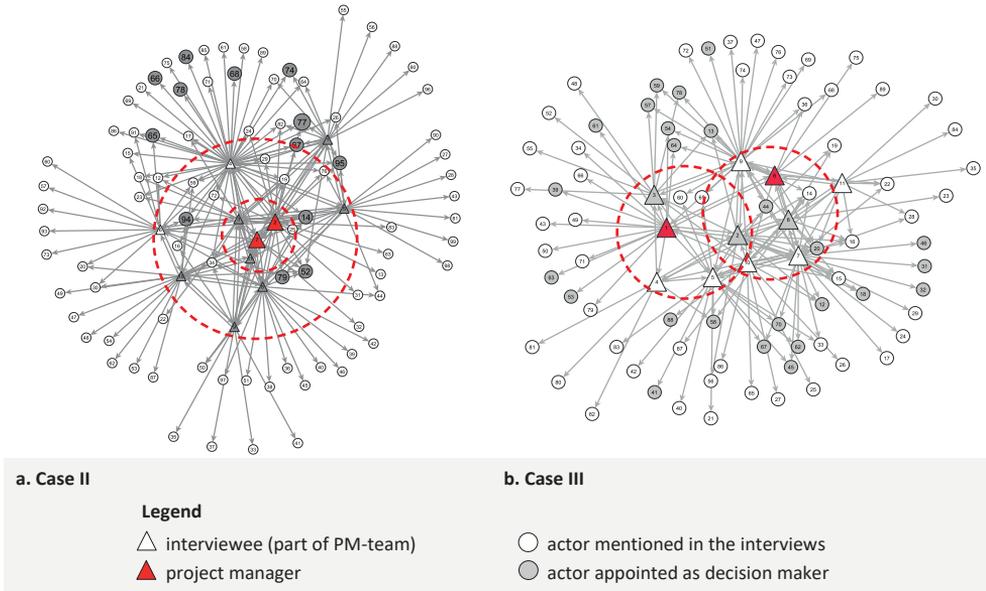
6.4.5 Organizational context unclear

The last assertion is derived from several observations in the interviews. The interviewees used different language when referring to the actors: some mentioned names, others mentioned functions or used the roles. Moreover, the denominations of roles and functions were used differently among interviewees, while meaning the same actor (names are asked during the interview to be sure which actor was meant). The interviewees were also ambiguous about the purpose of their contact and at times even questioned the purpose of their own role. Interviewees could indicate the parent organization of their contacts but often could not address in which department and under which supervision the actors belong. These observations show that the establishment of contacts in the project management team is primarily an operational element. Only to a very limited extent a strategic network approach of the contacts is shown in the explanation of the purpose of the contact. The next assertion emphasizes the need for both partners to work with complementary processes which should lead to one goal:

Clear lines of information, responsibilities and decision-making processes from the private project organization through the public project organization and public parent contribute to the cooperation and the successful completion of the project.

In the cases evidence was found pointing in the direction that unclear roles have a negative effect on the external processes. Or that clear roles, preferably active roles, have a positive effect,. This is illustrated by the networks of Case II and III. The layout of the networks of Case II and III show clear differences (Figure 6-5). The core of the network is formed by those who have the highest degree of centrality. In Case II the core of the network shows three central nodes. Around the core seven nodes connect the center with the periphery. In the left graph of Figure 6-5 the indicated accountable actors of Case II (decision makers) are marked (grey nodes). Most of them are situated in the centre of the network, indicating that the decision makers are in contact with mutiple persons in the project network and thus receiving infor- mation from multiple channels. Almost all interviewed persons in this case are indicated as decision maker by others. This means that the responsibilities in managing the project by the project management team is recognized by the interviewees. The (only) indicated external decision maker on the private side is the chairman of the board (node 52 in Figure 6-5). On the public side 12 decision makers are indicated, from four different public organizations. All of them are important in the nessecary permit processes. At the top of the network four actors are connected to the project through only one link (node 66, 68, 78, 84). Two of these con- tacts concerned people who were frustrating the project. The interviewee indicated that the communication strategy was a common strategy of public and private project organisation. Interviewee_04: *"The joint approach to this stakeholder strengthened the relationship with the private partner."*

The core in the network of Case III (right graph in Figure 6-5) is formed by the public interview- ees at the left side and the private interviewees at the right side of the center of the network. In the middle of these two groups the public contract manager is situated (node 2 in Figure 6-5), together with the private clerk (node 10) and the private manager Technical Installations (node 9). Their position in the network shows that they are well connected to the other interviewees and through them with the rest of the network. Remarkably the relationships with these three individuals are indicated negative by several people from their own project management team. The interpretation of their role is perceived by others as not fitting with the position and in the opinion of others contribute negatively to achieving the project goal.

Figure 6-5 Network layout of Case II and Case III

a. Case II

b. Case III

Legend

△ interviewee (part of PM-team)   ◯ actor mentioned in the interviews

▲ project manager   ⬤ actor appointed as decision maker

6.5 Discussion

The assertions presented in this paper are derived from the cross case analysis of three cases. According to Stake (2006) this method can be used for 4 to 15 cases. The representativeness of the sample can limit the generalizability of the finding. Some themes from the analysis (Table 6-1) did not end up in the findings because possible evidence was not supported by all cases. The number of involved parent organizations and the number of self-employed team members were expected to have an influence on the combined project organization, but for these themes not enough supporting evidence was found. Although some indication of an influence was found, this occurrence was too small to draw conclusions. The presented findings are supported by all cases though.

One of the projects studied (Case III) was in the final stage of execution, while the other two projects were already handed over to the parent organization. The positive final results (in terms of meeting budget and time constraints) of the first and second case were known at the time the interviews were held. The answers of the interviewees may be biased by insights they had experienced later on in the project process. Data shows no evidence of such a bias: the results of the first and third case show most similarities, one finished and one almost finished

project. We believe it was more important that interviewees could reflect on the same phases. In their supporting examples the interviewees mentioned situations in the execution phase and sometimes the design phase. The three cases had comparable phases because the contract type was Design and Build, and comparable scope, hence useful to study these 3 cases.

Several interviewees in Case II and III mentioned a purpose of the contact that was not in the questionnaire: that of the preparation of the decision. Some indicated actors were responsible for preparing files for a particular senior manager or director (mayor, minister) who was accountable. The formal purpose of the relationship with these actors was to inform them. We included these actors in the analysis of the accountable contacts because the only reason to inform these actors was that they in turn inform the decision maker about the required decision, based on the information provided by the public project organization. These *decision preparers* do not have a formal role in the decision-making process, but we found them to be important connectors between the project organization and the parent organization. They are important informal elements in the decision-making process. These actors can be real bridges in the network, but also real showstoppers. Conscious positioning of these actors by the public project organization contributes to project success.

Finally we want to address an observation from the interviews. During the interviews, we got an insight into motives, personal perspectives, motivations and frustrations of the interviewees. Some people favor compromise and joint solutions, others prefer structure, arrangements and proper implementation. The preferences seemed to reflect their role or the role is in line with the personal preferences. People with a preference for structures, agreements and proper execution felt less comfortable in the project context. They experienced more negativity in their environment, and took that personally. In response, they are frustrated *("they just don't get it")* or passive *("I am in charge of nothing").* People with preference for compromise and joint solutions are mentioned positively by their colleagues in the project organization. People who feel comfortable in their role, appointed few negative influences from their contacts. And if they classify the relationship negative, then the effect is classified by them as a neutral effect. From this we suggest that individual motivation is an important element in the data of the cases.

6.6 Implications of the results

In this study the focus is on data providing insight into the influence of the environment on the combined project organization. That the environment of the project is a factor to be reckoned is known from previous research (Bryde and Robinson, 2005b; Bryson, 2004; McLeod et al., 2012). By asking for the reason, nature and impact of actors from the environment this study

adds insights on how the surrounding actors interact with the public and private project organizations and influence the processes in the combined project organization. Kort and Klijn (2011) already put emphasis on the importance of decision-making in public private partnerships. As the main purpose of contact with actors from the public parent organization is the need for a decision or approval (the actor is accountable), this research shows that the decision-making process reaches further than the combined project organization.

The decision-making process is often studied within the organization. From the present findings, the dimension *private project partner* should be added to decision-making process regarding project trade-offs. Jones and Deckro (1993) identified authority bifurcation as source of conflicts in matrix organizations. According to Sy and Cote (2004) the ambiguity over decision rights leads to tension and conflicts, which causes delays in decisions and can have impact on the quality of the decisions. The current study shows that this ambiguity on the interface between parent organization and project organization affects the cooperation between partners in the combined project organization.

In addition, this study adds *the attitude of the project management team towards decision-making as* important factor for successful public private collaboration. The *competence of the project manager* and *leadership* are frequently mentioned factors contributing to successful projects (Crawford, 2005; Prakash Prabhakar, 2008c). Presented findings complement the competence as a success factor by addressing the influence of the project management team on decision-making processes. By positive and proactive positioning of their own role in these processes their influence increases. To do so, the public project organization should be organized at a certain distance of the parent organization and be able to act with (proportional) autonomy. Moreover it supports the needed transparency in the relationship towards the parent organization in the role of authorization institute.

In the line of competences needed in the project management team to enhance project performance *finding the right focus* and *the relevant knowledge or experience needed* are added. Previous research indicated that the educational background of the project manager is of influence on the perception of project success (Koops et al., 2016). This study demonstrates that the absence of the needed knowledge in the project organization causes inefficiency and delay. The organization of support in the parent organization by the public project organization is a major concern, especially in large projects. The fourth and fifth assertion point out the importance of clarity in the purpose of contacts and the importance of a network approach.

These findings support the appeal of Winch and Leiringer, (2016) that project organizing by permanent owners has received too little attention (Winch and Leiringer, 2016). Further re-

search into the perspective of the owner-operator role in project based organizations related to projects is necessary to develop new models that help people in this role and projects to focus on their contribution in the accomplishment of organizational goals.

6.7 Limitations and further research

This study has some limitations in its results and conclusions. The first limitation is related to the research design applied and the characteristics of the data used. This study is set-up from an ego-centric approach and used the contacts that are mentioned by the interviewees. The results are based on the interviewee's answers and depend on the perception and memory of the contacts. Though we believe that the most important persons are indicted by the interviewees, future research can benefit from a Network Approach that uses digital resources to monitor contacts from all participants, including the directions. More connections from the project organization can be analyzed to complete the network and also the connection between contacts. Future studies on this quintain should include more projects. An interesting avenue for future study of this quintain is to use other data, like project reports, gate reviews and further available project information. We highly recommend future research should also include the personal subjective perspective which cannot be captured in reports.

The data obtained are limited by the memory and truthfulness of interviewees and their interpretation of the questions. Their subjective verdict on the nature or relationships can be influenced by the project phase, especially in Case I and II were the project was recently finished. Although the interpretation of the interviewee is of value in order to reveal differences of viewpoints, future research on these findings can put more emphasis on the actual organizational structures and arrangements compared to the perceived structures and arrangements.

This research touches on the subject of power and politics in organizations and in particular in decision-making processes. The assertions are formulated to encourage the project organization to increase their influence on project performance. We started our research by mapping how information flows from actors in the system and by doing so we saw that besides the information, the framing of the information by the actor can influence the effectiveness of action. From this observation we recommend research into the motives of actions within the broader network surrounding the combined project organization, with a specific interest in increasing the effectiveness of project managers and project management teams.

Finally we reach out from the field of project management research to the field of organizational research. We expect this field to add useable knowledge to increase the effectiveness of the

temporary project organization. We recommend a discussion between these two scientific fields about the variables that make the difference between project and organization (if any), like budget, duration, number of people involved to name a few.

6.8 Conclusion

The purpose of this research was to explore the influence of external actors, especially the public parent organization, on the combined project organization. The results show the effect of actions in the surrounding of the combined project organization. It puts great focus on the different connections a public project organization has with its parent organization and other public partners. It shows that clarity and a common view is needed in the approach of external actors, especially those that are accountable. The addressed influences in this research are in line with the findings of Aarseth (2012) who mentions *internal organizational challenges* and *external contextual challenges,* but the specific perspective of our research is important (Figure 6-1C). Although the mechanisms are similar, the positioning of these mechanisms from the perspectives of the combined project organization changes the concepts *internal* and *external.* Moreover the supposed 'internal' challenges are at least partly *external* for the combined project organization and influencing the cooperative relationship between public and private partner. Different approaches of *internal processes* become sources of tension and long lasting discussions between partners. The external challenges are in fact internal challenges for the client-owner and operator-owner. The combined project organization has to learn how to operate within the existing equilibrium (LaPalombara, 2001). But most of all we believe that a more sustainable solution for these challenges should come from the organizational context of the public parent organization. Further research in this area is recommended.

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Chapter 7 Analysis of relationships

Abstract

The social network analysis of the cases was performed from an ego-centric approach, meaning that the project network is mapped from a central point. The center of the mapped networks is formed by the core management teams of public and private project organizations. In this chapter the network of each case is presented in full detail. After a brief description of the project management team of public and private partner the features of the identified nodes and their position in the network are analyzed. Then attention is paid to the connections (links), their nature (how the interviewee perceived the relationship) and effect on the cooperation in the project organization. Based on the purpose of the connection, consideration is given to the position of the nodes in the project context and their expected contribution to the project. Each project analysis ends with a discussion on the influence of the connections in the project.

This chapter shows that Social Network Analysis is a valuable approach for studying coordination mechanisms in inter-organizational project arrangements. The information channels within the project organization can be distinguished, as well as the links between project organization and parent organization. A substantive analysis of the reasons for the links shows that the project environment is in a sense 'manageable', especially when the approach is consciously considered and coherently applied by several individuals.

7.1 Introduction to the network layouts

The cross-case analysis (Chapter 6) combines information from three cases. This chapter contains a more in-depth analysis of each case. The contacts, their features (Appendix VII) and the connections that relate one individual to another are studied in detail. As mentioned in Section 6.3, this data was obtained from interviews. This sub-study was set-up using the ego- centric approach, with the public and private project managers as the starting point. This resulted in 26 interviews with core team members of the project organizations.

The connections are not the properties of individuals, but the properties of the relational systems of individuals built up from connected parts of interacting people. The method appropriate for analyzing such relational data is that of social network analysis (Scott, 2013; Wasserman and Faust, 1994; Winch, 2013). In social network analysis the relations are treated as expressing the linkages that run between individuals. An often used supporting element in social network analysis is the sociogram (Scott, 2013; Wasserman and Faust, 1994). A sociogram was developed in the 1930's and shows in a graph individuals as nodes (points) and relationships as links between the nodes (lines). For analyzing social networks a lot of software packages are available. Based on the features of the networks, ego-centered, small networks, and the purpose of using the software, Visone (version 2.13) is used to model the outcomes of the interviews. This program is designed specifically for the graphical analysis of social networks. The primary data per case consisted of (1) the characteristics of persons and (2) the characteristics of the links. The information per case was processed in Visone, enabling visual data analyzes in different graphical modes.

In this chapter several graphs from Visone are shown, in two layouts: centrality layout and the organization-grouped layout. The characteristics of persons and connections are shown in the color or the shape of the node. A triangle is used for the interviewees and a circle for a person mentioned by the interviewees. In a number of graphs blue fill of the shape is used when the person is part of a public organization and yellow when a person is part of a private organization. The connection is shown in the graphs by an arrow, from interviewee to the mentioned contact(s). Colors are used to show the characteristics of the relationships. Both the nature of the relationship was asked from the respondent as well as the influence of the relationship on the cooperation in the project. When positively named, it is graphically displayed with a green line between the nodes and when negatively named, it is graphically displayed with a red line. Please note that all this is in the opinion of the interviewee.

In the centrality layout, the position of the nodes also provides information. The more connections a node has, the more central this node is positioned. If the connection is mentioned

vice versa, these nodes are positioned with less distance between nodes. This concept of point centrality is indicated with the betweenness. The betweenness measures the extent to which a particular node lies 'between' the various other nodes in the graph (Scott, 2013). In the centrality layout, it can thus be seen who is positioned in the core of the project network (these nodes have a low degree of betweenness). These people get a lot of information from different people in the project network, and have a potential for control over others. They are able to provide others with a lot of information or can be a *gatekeeper.* The nodes in the area around the core can provide the core with new information they get from their connection with the nodes in the periphery, and can bring information to the nodes in the periphery. They depend on the central nodes for information from the other side of the network. The nodes in the periphery of these networks are part of other networks (like their parent organization), so these people are connectors between these networks. Information can flow from network to network though these nodes.

7.2 Case I: Reconstruction of a road, initiated by local government

The project organization consisted of two separate project teams, a public project team and a private project team. The public project team was led by the public project manager who was responsible for the project on behalf of the local government. The contract manager and the other advisors of the public project team were employees of an engineering consultancy firm. The public project manager and key-players indicated by the public project manager were interviewed. The indicated key-players are the public contract manager, a specialist on an important technical issue (soil pollution), the private project manager and the private environmental manager.
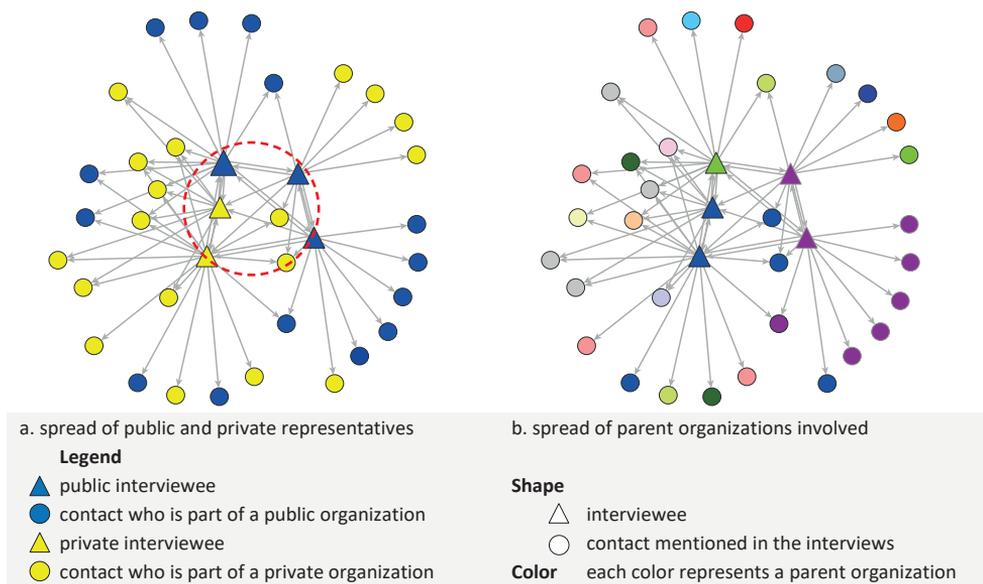
7.2.1 Position and attributes of nodes

The network graph of Case I is shown in centrality layout in Figure 7-1, the triangle nodes represent the people who were interviewed. The links are based on the perspective of the interviewee and directed from the interviewee to the mentioned contact. A realistic approach was used to identify the boundaries of the network as perceived by the interviewees. The people in the network are connected through the project and their expected contribution to the project goals.

In the left network (a) people who represent the public organization are visualized in blue nodes, the yellow nodes represent people of private organizations. The colours used in the right network (b) indicate the parent organization of the people involved, for instance the municipality (green), a consulting company (purple), the contractor (blue), the subcontractor (pink)

and self-employed (grey). In this case five public and twelve private organizations are involved (regional entrepreneurs counted as one group).

Figure 7-1 Social network of the project management team of Case I

a. spread of public and private representatives

b. spread of parent organizations involved

Legend

▲ public interviewee
● contact who is part of a public organization
▲ private interviewee
● contact who is part of a private organization

Shape

△ interviewee
○ contact mentioned in the interviews

**Color**   each color represents a parent organization

In network b, where the parent organization is the leading color in the visualization, there is no identifiable cohesion in the network, except for the (purple) subgroup at the right of the network. This figure illustrates that the project creates a new network. From the interviews it was noticed that members of the public management team indicated each other as project relations, whereas the private project management team members did not. The private project team consisted of employees from the same parent company, their connection was not solely related to the project. The members of the public project team originated from different parent organizations, their involvement in the project is the purpose of their contact and their position in this network. The reachability of the nodes in the core of the network is high, as can be concluded from the centrality layout, in which the central nodes are positioned on small distance from each other since the interviewees mentioned each other. This is not necessarily a good thing. In the interviews one of the blue colored nodes (Figure 7-1b) expressed his displeasure about the manner in which his colleague (also blue in Figure 7-1b) from the parent company directly communicated with the other members in the project management team. Another observation from the interviews concerns the interviewees' view on the role of others in the project. Interviewees indicated the roles of the same people differently – so the functions in the project context, also within the project management teams, were unclear to the participants.

7.2.2 Analysis based on the connections

The next thing is to consider the information in the organizational context, using another lay- out. In Figure 7-2 the visualization of Figure 7-1a is changed to the organization-grouped layout, in which the position of the nodes is based on their organization in instead of their centrality degree. It shows the nodes positioned in the same line as part of the same (type of) organization and in the same colors (blue for public and yellow for private). The public private project organization is shown in the center (nodes on line C and D), in the red box. The indicated contacts in the public parent organization or other public organizations are positioned above the project organization (nodes on line E and F). The contacts in the private parent organization or other private organizations are positioned beneath the public private project organization (nodes on line A and B).

Figure 7-2 Nodes of Case I in project organizational context
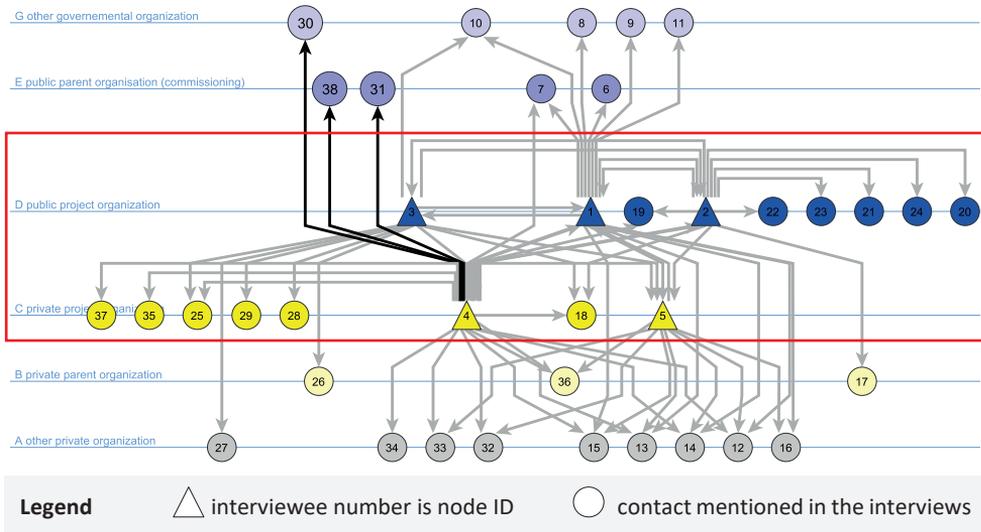
From this graph (Figure 7-2) the connections in the network of Case I are considered. The horizontal links (from node to node on the same line - line C or D) are of an operational nature as they represent contacts between people in the project organization. The connections in the project network indicate the loose connection of the project organization to the public and private parent organizations: from this graph limited connections can be seen from the project organization (node 1, 2, 3, 4 or 5 on line C and D) to the public parent organization (node 6, 7, 31 and 38 on line E) or the private parent organization (node 17, 26 and 36 on line B). This indicates that the parent organizations in this project are hardly of influence. The public project manager (node 1) is almost the only member of the public project team with connections to

other public employees, both in the parent organization (line E) and in other public organizations (line F). The connection of the public specialist for soil pollution (node 3) to the assessor of a specific permit of the province (node 10) is the only exception. In this project the public project manager is the linking pin between public parent and public project organization. The project manager of the private team (node 4) mentioned four interactions with public authorities (node 7, 30, 31 and 38), as shown at the upper part of Figure 7-2. Two of the indicated contacts in the public parent organization (node 31 and 38) were not mentioned by the public project manager. One of them (node 31) is the public officer who is responsible for monitoring the correct and safe usage of public space. It is a contact with an operational nature and directly connected to activities of the private project organization. The other contact is the alderman of the public parent organization (node 38). The public project manager did not mention him, in his turn the public project manager mentioned the official principal (node 6) as his link to the public parent organization.

Only one employee of the public parent organization (node 7) is connected to both the public and private project manager. This node represents the licensing officer of the construction permit department. In Case I some mentioned contacts were approached (with permission of the public project manager) and asked for their point of view regarding their contribution to the project. The licensing officer was one of these contacts. The interviewees and the licensing officer indicated there was no connection to the project other than the official task of assessing the licenses. Interviewee_7: *"Especially since there was no contact prior to the contract I feel no connection to the project other than assessment of the outcome of legal requirements."* The private project manager (node 4) expressed his astonishment that the licensing officer did not seem to know the public project manager, who he himself considered colleagues.

The one connection the private project manager (node 4) mentioned with a public servant from another public authority is the connection with the assessor Sanitation and Safety (node 30). This assessor is responsible for monitoring the execution of the agreements made concerning working in contaminated soil. The general public responsibility for monitoring environmental affairs is covered at regional level. It is a contact with an operational nature and directly connected to activities of the private project organization.

At the left side of the network a public interviewee (node 3) indicated two private employees of the private project organization (node 28 and 29). These people were not mentioned by the private project management team members (no connection from node 4 or 5 to these nodes). The purpose of this connection was to reach agreement about the way the private project organization could execute their work in the contaminated soil. Node 27 was also an expert in this field and involved in this dossier by the private project organization. This is the field of

specialists and their issues were of highly operational nature. Most of the problematic issues had a technical origin, which might explain a lack of interest of the project management. But the influence of the problems was severe (including safety issues), so management attention could be expected here. In the interviews there was no indication of awareness of this issue on managerial level, nor an indication of damage control on tactic and strategic level.

7.2.3 Purpose of the connection based on responsibilities

After identifying the nodes and their features and the general layout of the connections indicated, the next thing to examine is the purpose of the contacts. Interviewees were asked to indicate the purpose of their contact based on four possibilities which were extracted from the RASCI method: Accountable, Support, Consult and Inform (as explained in Section 6.2 and Section 6.3). The interviewees are Responsible for specific sub-processes in the project organization.

The first group that is examined in this chapter contains the indicated *supporters* of the project management team. The tasks these people have in the organization are supportive to our interviewees and are considered to be on operational level. Based on the outcomes of their works, which could be information or a product, the interviewees can perform their tasks and take their responsibilities. Figure 7-3 shows the people in the network that are indicated as supporters by the interviewees (grey nodes), positioned in the organizational context. As expected most of the supportive nodes are in the project organization.

Figure 7-3 Supporters (grey nodes) and their relationships to the project management team
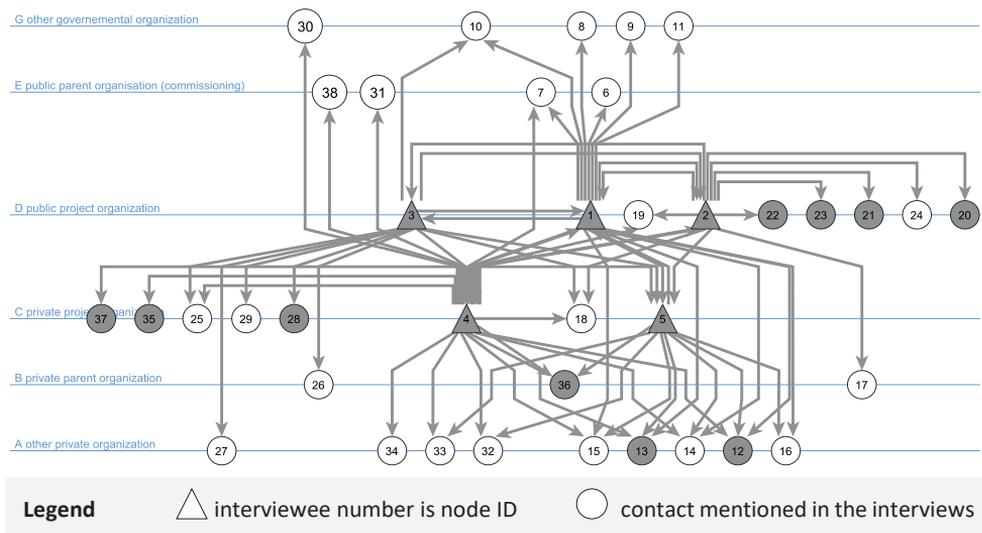
Three contacts outside the project organization are indicated as supportive. One of these contacts (node 36) is a subcontractor from a separate business unit from the main concern. In the perception of the private interviewees this subcontractor is no part of the project organization but well connected to the project (mentioned by interviewee 4 as well as interviewee 5). In the centrality lay-out this contact is a margin node (between center and periphery). The other two supportive connections outside the project organization (node 12 and 13) are both representatives of the utility companies. The work these companies had to perform was embedded in the overall execution.

Figure 7-4 illustrates where the people who are indicated as accountable or decision makers can be found (grey node). Within the project organization only one person is indicated as decision maker: the public project manager (node 1). This indicates clear leadership while others recognize him as the one who is accountable for the project. Interviewees from the private project organization do not indicate anyone inside the project organization nor in their parent organization as accountable. Remarkably the only contact in the private parent organization that is indicated as decision maker (node 17), is mentioned by an interviewee from the public project organization. This contact is the business manager of the contracting company.

On the public side five people are indicated as accountable or decision makers: three in the public parent organization and two in other public organizations.

Figure 7-4 Decision makers (grey nodes) and their relationships to the project management team
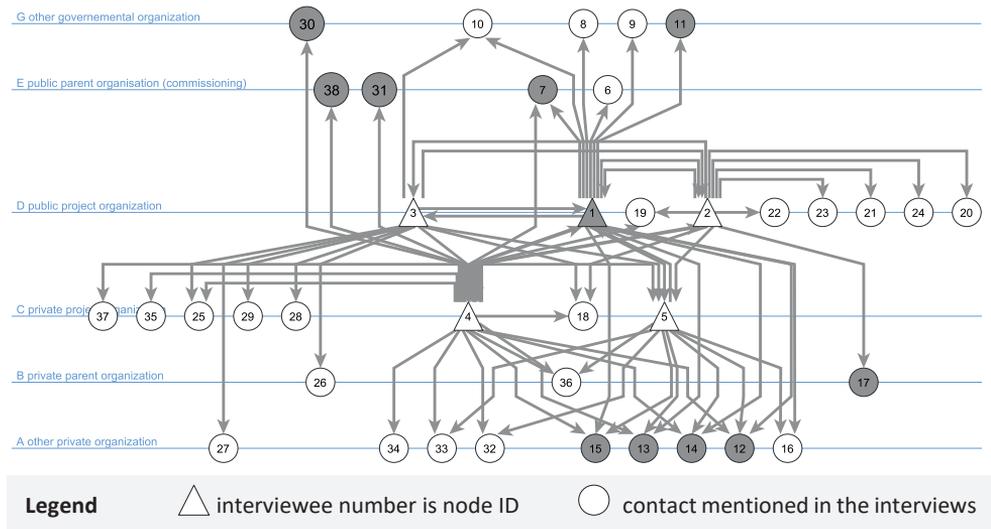
Four of the indicated decision makers on public side are representatives of specific disciplines who are assessor of the project plans and that provide permits to specific executional works of the project (node 7, 11, 30 , 31). Though their authorization is necessary to the project the public project manager mentioned only two of them as relations. The alderman is indicated accountable for scope change (node 38) by the private project manager, but not by the public project manager. In return the private project manager did not indicate anyone from his parent organization as decision maker. The decision makers outside the project organization on private side (node 12, 13, 14 and 15) are all representatives of the utility companies. These companies had to execute particular work in the project concerning their assets, work that interfered physically with the execution of the private project organization. These companies have contractual arrangements with the public project organization about the execution and they have to make practical arrangements with the private project organization. The contacts were appointed as decision-makers, because the interviewees considered them operating in autonomous processes. The control of the activities of the utility companies was mainly a process that was done from the parent organizations of the utilities. The utility companies had no decisive role in the public private context but their decisions did influence the public private project. The interviewees indicated that they depended on the internal decision-making processes in the utility companies.

The people that were informed about the project (one-way communication) are either in the periphery of the project or in the center, which is clearly visible in the centrality graph (grey nodes in Figure 7-5).

Figure 7-5 People who are informed in Case I (grey nodes)
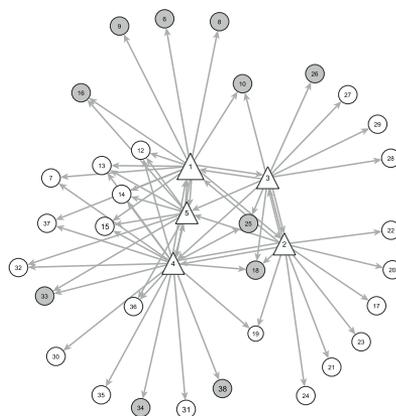
| **Legend** | △ interviewee number is node ID | ◯ contact mentioned in the interviews |

Those contacts that are in the periphery, are either local entrepreneurs or enforcement officers (node 8, 9, 16, 33, 34). The central nodes are people working on executing the project (18, 25). Some of the contacts that are also indicated as accountable are being informed as well (node 6, 10 and 26).

People who are consulted can be found either in the project organization (node 3, 19, 24, 29) or in other private companies (grey nodes in Figure 7-6). The consulted people outside the organization were in an informal way able to influence the project. The consulted people are considered experts on specific issues, in this project contaminated soil (node 3, 27, 29), the executional works (node 19, 24) or stakeholders with a specific interest, like entrepreneurs and residents in the region (node 16, 32) and utility companies (node 12 t/m 15).

Figure 7-6 People who are consulted (grey nodes) in organizational context, Case I
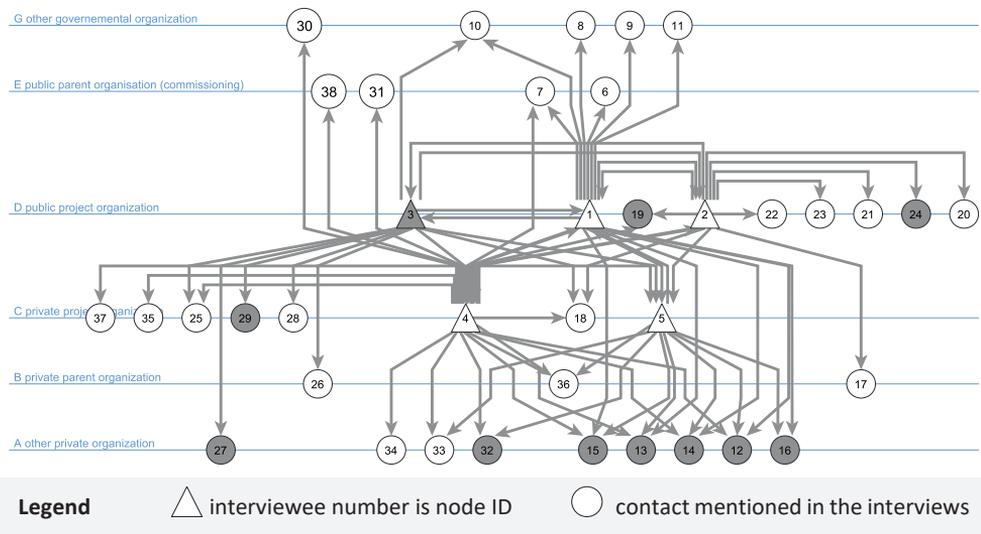
7.2.4 Influence of the actors

Interviewees were asked the nature of the relationship as well as the effect of the relationship on the project. Most of the external relationships are negatively perceived (45%), a minority is perceived positively (19%), see Figure 7-7. The public project manager was positive about the relationship and the effect of the relationship with the private project management team (node 4 and 5). The private project manager was not positive about the public project manager (node 1), in particular the ambiguities in the technical and functional requirements and the scope were mentioned.

Both public and private project team expressed that important negative influence was coming from the utility companies (nodes 12 to 15). The purpose of the contacts with these nodes was supporting the project (S), consulting (C) to match the interfaces and deciding (A) in their own project. The relationship with the public and private project management team was negative (node 1, 4, 5). The effect was considered worse by the private project management team; they suffered from both delays in their activities as from complaints from residents along the project. The public project manager team considered this mostly an operational problem; he classified the effect neutral.

Figure 7-7 Nature and effect of relationships in Case I
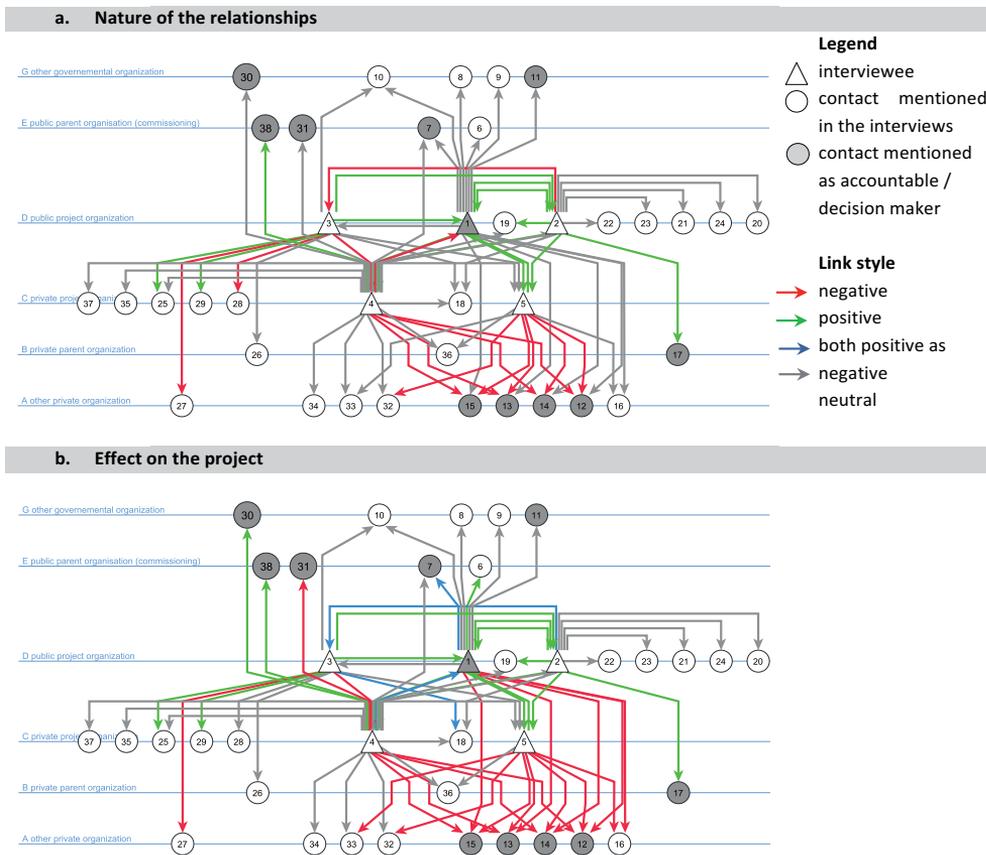
The mentioned contacts at the utility companies were asked to indicate their relationship with the project. One utility company indicated that the project planning was not in line with their internal timeline. Interviewee_12: *"Internal procedures such as waiting for an approval for an*

assignment could affect the overall schedule of the project." Another utility company mentioned their assets in this municipality were given special attention because of the poor soil conditions in this area. The company was discussing this with the alderman. The discussions were initiated during the executing phase of the project.

The dossier of the polluted soil is another source of tension in the project organization. The experts from public and private side (node 3, 4) experienced negative influence of their contacts (node 3, 4, 26, 27). Continuing discussions on this subject caused tension in the cooperation, delays and budget problems.

Not all negative relationships were perceived to have a negative effect on the project. The negative relationship with a local entrepreneur (node 16) was less of influence on the project success than the negative relationship with residents (node 32). The private project manager nuanced the influence of the negative relationship with the private administrator public space (node 31). The influence of relationships outside the project organization was positive on two occasions, both on strategic level. These contacts are accountable in the parent organization: the alderman of the municipality (node 38) and the business manager (node 17). The positive indication of the relationship is linked crosswise (public to private and private to public).

7.3 Case II: Construction of a new tunnel, by a regional government

The project organization in this case consisted of two separate project teams. The public project team was organized at *arm's length* of the regional government: an independent organization specially formed to deliver the project. The regional government would become the owner of the new asset, co-financed by the national government. The regional government already owned comparable assets - which were operated by a semi-private organization of which the regional government was the only shareholder. This semi-private asset management organization was going to operate the new asset after delivery by the project organization. The core of the public project team consisted of a project director, a project manager, a technical manager, an environmental manager and the manager finance and control. There was no separate contract manager, supervising the scope was part of the responsibilities of the technical manager. The team had formed an advisory board, which they could consult or who could advise them on their own initiative.

The private project management team consisted of a private project manager who led the private project management team. The three contractors, who together formed a consortium

for this project, were represented in the project management team. The project management

team consisted of 'four + one' positions: the project manager, the responsible managers of the integrated design, the business office (preparation and control) and the execution. The responsible manager of the technical installations (the '+ one') was added to the management team because of two main reasons: (1) recent negative experiences in integrating constructive design with installation design and (2) the responsibility of the parent company in the consortium. The private project manager was assigned by the project board, which consisted of a director of each contractor.
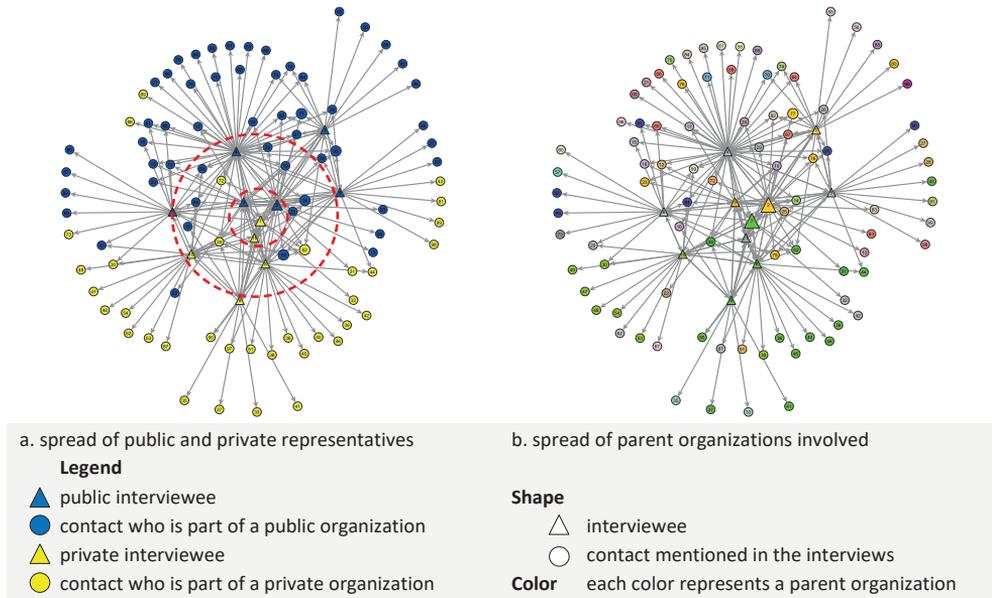
The majority of the people in the project management team was involved from the start. No significant personal changes had taken place during the time the cooperation existed (design and execution phase of the project). Due to the underperformance of an individual some changes were implemented consciously and timely. The public project manager mentioned for instance he occasionally consulted the private project manager about the possible deployment of a new employee in his team.

7.3.1 Position and attributes of nodes

The network of Case II is shown in Figure 7-8. The triangle nodes represent the people who were interviewed. The links are directed and based on the perspective of the interviewee. Again a realistic approach to the boundaries of the network was used as perceived by the interviewees. The people in this network are connected through the project and the expected contribution to the project goals. They represent 14 public and 28 private organizations. Like in Case I, interviewees used different function descriptions of others while they were actually referring to the same person(s). This indicates that the position or function of persons in the project is not always clear. In network b, barely distinguishable patterns are shown (Figure 7-8).

The people in the project organization form a new network. The core of the project network is formed by those who have the highest degree of centrality: two public and two private interviewees (node 2, 3, 7 and 11). These nodes represent the general manager and the technical manager of the public project management team and the private project manager and the execution manager of the private project management team. Their position in the core shows that they are well connected to all areas in the network. This allows the people in the core to receive information from different sides, enabling them to value the accuracy of the information. Around the core the other interviewees are situated. They have a high betweenness degree while they connect unique nodes to the core. Their position in the network illustrates their important role in the flow of information in the network. These nodes bring in unique information from the periphery into the core and vice versa.

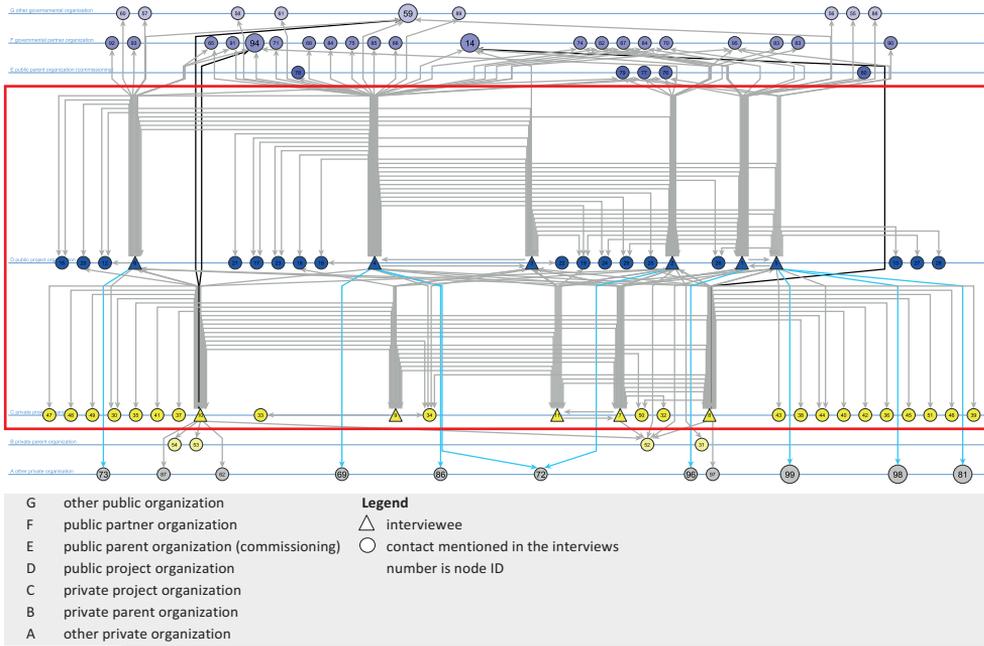Figure 7-8 Social network of the project management team of Case II

a. spread of public and private representatives

Legend

▲ public interviewee
● contact who is part of a public organization
▲ private interviewee
● contact who is part of a private organization

b. spread of parent organizations involved

Shape

△ interviewee
○ contact mentioned in the interviews

Color each color represents a parent organization

7.3.2 Analysis based on the connections

Next it is considered who is part of the project organization and who is not. In Figure 7-9 the nodes are sorted based on their position in the organizational context instead of their centrality degree. It shows the nodes positioned in the project context in the same line and colors (blue for public, yellow for private). The public private project organization is outlined by a red box, in the center of the graph (line C and D). The indicated contacts in the public parent organization or other public organizations are positioned above the project organization (nodes on line E and F). The contacts in the private parent organization or other private organizations are positioned beneath the public private project organization (line A and B). A few connections are highlighted to support the findings that are mentioned in this section.

From this graph (Figure 7-9) the connections in the network of Case II are analyzed. The horizontal links (from node to node on the same line - line C or D) are of an operational nature as they represent contacts between people in the project organization. From the public project management team members (blue triangles) a widespread network can be seen at the top of the graph. This indicates a wide network of connections of the public project team in the connected public organizations. At the bottom of the graph limited connections can be seen from the private project management team members (yellow triangles) with private companies that are not considered part of the project organization.

Figure 7-9 Nodes in project organization context of Case II (also in Appendix VIII)

G	other public organization	**Legend**
F	public partner organization	△ interviewee
E	public parent organization (commissioning)	○ contact mentioned in the interviews
D	public project organization	number is node ID
C	private project organization	
B	private parent organization	
A	other private organization	

The private project management team members indicated three connections to public organizations (black links), not being part of the project organization. These contacts are also connected to the public project management team, visible in the grey lines in the graph. The contacts (node 14, 59, 94) are assessors of stakeholder organizations who had obstructive power. If they did not approve products or test results this would immediately influence the project result. In the contractual agreements the responsibility to get the approval was given to the private company. In the interviews, the interviewees of the public project management team showed great awareness of the influence of these stakeholders and they made organizational arrangements to have influence on these processes. The Technical Manager of the public project organization describes one of the assessors as a very precise person. He let a specific person of his team accompany the private partner in this dossier so he could function as an intermediary between them. He stated: *"The effort that was needed to prevent this issue to become disturbing for the project was disproportionate".*

The relationship with the other two assessors stemmed from their role in the operational phase, after delivering the project. The formal procedure was to deliver the project from the private consortium to the public project organization to the future owner. In practice this would happen at the same moment. For both the public and private project organizations it was im-
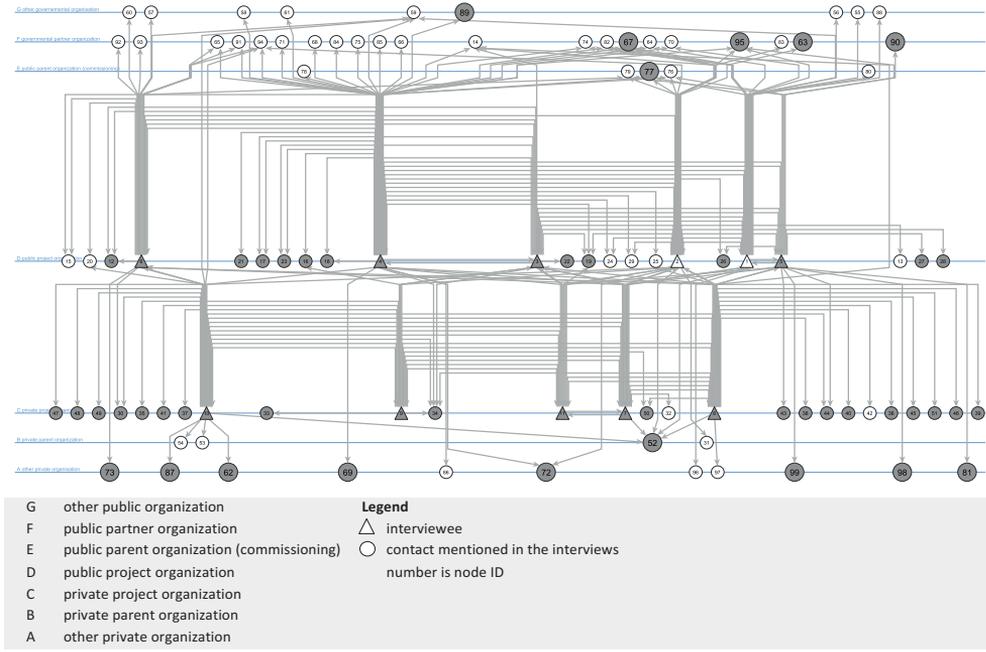
portant that these stakeholders did not obstruct the process of completion and handing over of the project. The public project organization had chosen to invite these stakeholders regularly in their team. As a result, the team was assured of receiving their specific input. This occasionally led to additional requirements. In the interviews the public Manager Technical Installations stated that this led to tensions with the private party.

The public project management team is connected to eight private companies that are not part of the project organization (blue links). Three connections are to utility companies (node 72, 73). In Case I this group was in contact with both public and private project management team and they were negatively influencing the project success. In this project the utility companies only had contact with the public project organization (general manager and environmental relationship manager). Three other connections (to node 69, 86, 96) are to environmental parties that were informed about the project (landowners, citizens and the director of a company nearby). Finally the connections at the right side of the graph (to node 81, 98, 99) are operational contacts that support the organizational processes (insurer, banker, accountant). These connections did not add specific input for answering the current research question.

7.3.3 Purpose of connections based on responsibilities

After identifying the nodes, their features and the general layout of the connections indicated, the purpose of the contacts is examined. Interviewees were asked to indicate the purpose of their contact based on four possibilities which were extracted from the RASCI method (as explained in Section 6.2 and 6.3). Not the responsibilities of the interviewees themselves are examined, but the role and responsibilities of others, appointed by the interviewees. Figure 7- 10 shows the people in the network that are indicated as supporters of the interviewees, positioned in the organizational context. The tasks these people had in the organization were supportive to our interviewees and are considered to be on operational level. Based on the outcomes of their works, which could be information or a product, the interviewees could do their task and take their responsibilities. Most contacts indicated as supportive are inside the project organization, as expected. At the bottom right side of the graph the banker, insurer and accountant (node 81, 98, 99) were supportive to the public project organization, though outside the project organization. Further to the left the utility companies (node 72, 73), landowners (node 69) and subcontractors (node 62, 87) were indicated as supporters. In the private parent organization one person (node 52) was appointed as supportive to the responsibility of the interviewee. This label was given by the public project manager to the chairman of the board of the private project organization. The public project manager stated that the chairman had to support him by delivering the project.

Figure 7-10 Supporters (grey nodes) and their relationships to the project management team

G	other public organization		**Legend**
F	public partner organization		△ interviewee
E	public parent organization (commissioning)		○ contact mentioned in the interviews
D	public project organization		number is node ID
C	private project organization		
B	private parent organization		
A	other private organization		

As can be seen from the top of the graph, a few people in public organizations were appointed as supporters. The contact in the public parent organization (node 77) represents the provincial executive, who was the only representative of the shareholder according to the Assignment Agreement for the project organization. In this role the provincial executive was accountable, Supportive and Informed. The executive was informed most of the time. His support was mainly attributed to the annual granting of the required budget. Decisions outside the mandate of the project director had to be taken by this executive. Other indicated supportive contacts were the leading executive officer and the alderman of the municipality (node 63, 67). They were supportive to the project by (1) providing adequate capacity and timely attention to the licencing procedures of the project and (2) handing over a specific part of their land. The explicit attention for the licencing procedure at this higher organizational level in the public organization is very different from the way Case I dealt with this issue. The manager of a project nearby (node 89) had to support the project with information for adequate interfacemanagement. Finally two contacts from the organization that will be in charge of the operation of the project (node 90, 95) were appointed as supporter. They support the project team with information and technical requirements so the project organization will deliver the right product.

In the next graph (Figure 7-11) the contacts that are accountable (decisionmakers) are marked in the project netwerk. Most of them are situated in the centre of the network indicating that the decision makers were in contact with mutiple persons in the project network and thus receiving information from multiple channels. Almost all interviewees were indicated as decisionmakers. The diveded responsibilities in managing the project by the project management team members was recognized by the respondents. The (only) indicated external decisionmaker on private side is the chairman of the board (node 52). On the public side 12 decision makers were indicated, from four different public organizations. All of them were important in the nessecary permit processes. At the top of the network four contacts are connected to the project through only one link (node 66, 68, 78, 84). Two of these contacts concerned people who were frustrating the project.

Figure 7-11 Decision makers (grey nodes) and the relationships to the project management team
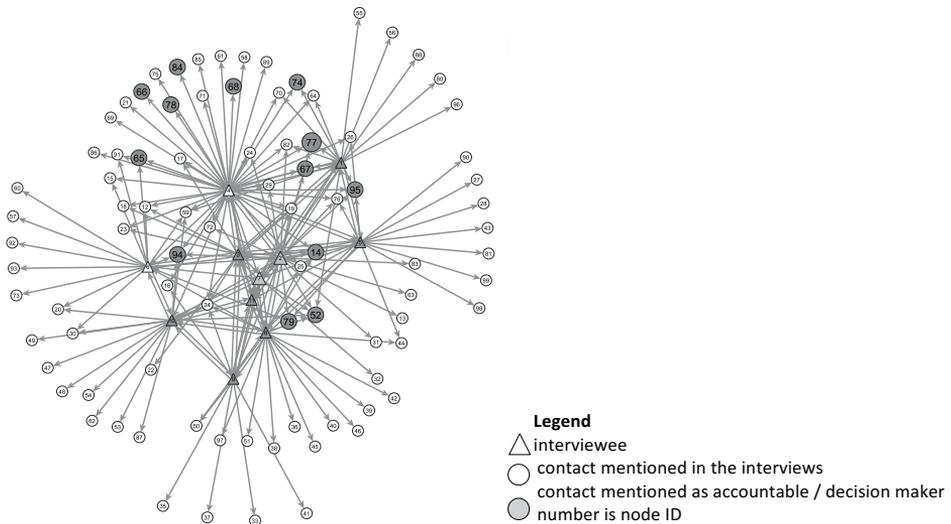
Public decision makers in the network of Case II

ID	Role	Parent
14	Execution manager	Railway company
74	Regional director	Railway company
77	Provincial executive	Province
78	Expert of the province	Province
79	Future owner	Province
84	Representative of infrastructure organization	National authority
94	Member of the future owner organization	Operational organization
95	Director of the future owner organization	Operational organization
65	Coordinator licensing of the municipality	Municipality
66	Expert of the municipality	Municipality
67	Alderman of the municipality	Municipality
68	Group of officials	Municipality

A lot of people that were informed about the project are in the periphery of the project, which is more clear in the centrality graph (Figure 7-12). Most of them are contacts of the relational stakeholder manager (public project team), whose primary task in the project organization is to keep stakeholders informed. Another group can be recognized in the upper right part of the network (Figure 7-12). These are the contacts at strategic level. The role of these connections was clearly positioned in the interview with the project director: *"On purpose I did not name this group the 'steering group' as they are often mentioned. I have named this group the coordination group, because I keep them informed and they keep their organizations aligned with the project. They do not steer the project, that is our job."*

People who were consulted can be found at different locations in the network (25 grey nodes in Figure 7-13). The members of the public and private project teams consulted each other (4 public nodes and 4 private nodes). The contacts in the project organization (7 public nodes, 1 private node) were consulted because of their expertise on certain topics. The people in the parent organization that were consulted (4 public nodes and 1 private node) were both consulted and appointed as decision makers. Consulting these contacts was done in preparation of a positive decision. Finally the six consulted people outside the project and parent organizations were consulted because their role as advisor with regard to the operational phase towards decision makers, like representatives of the fire brigade and ambulance attendants (6 semi- public nodes).

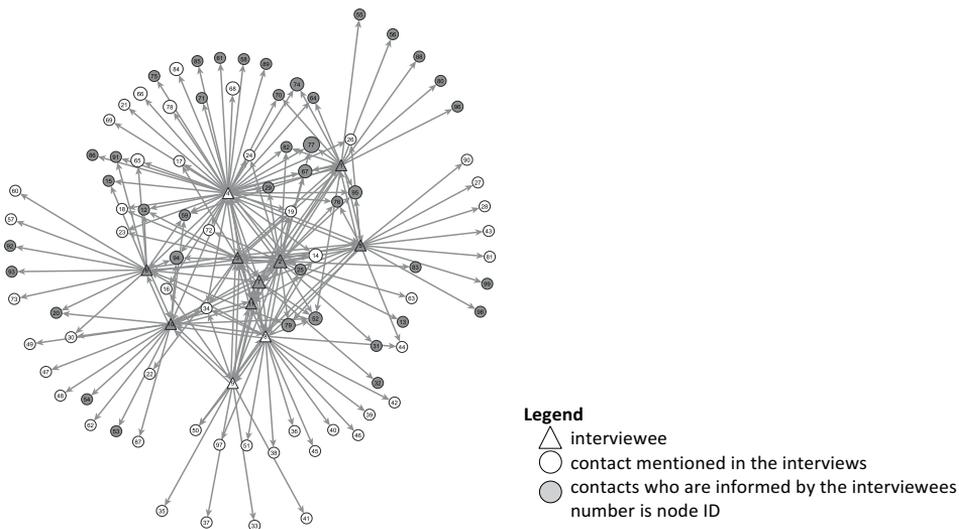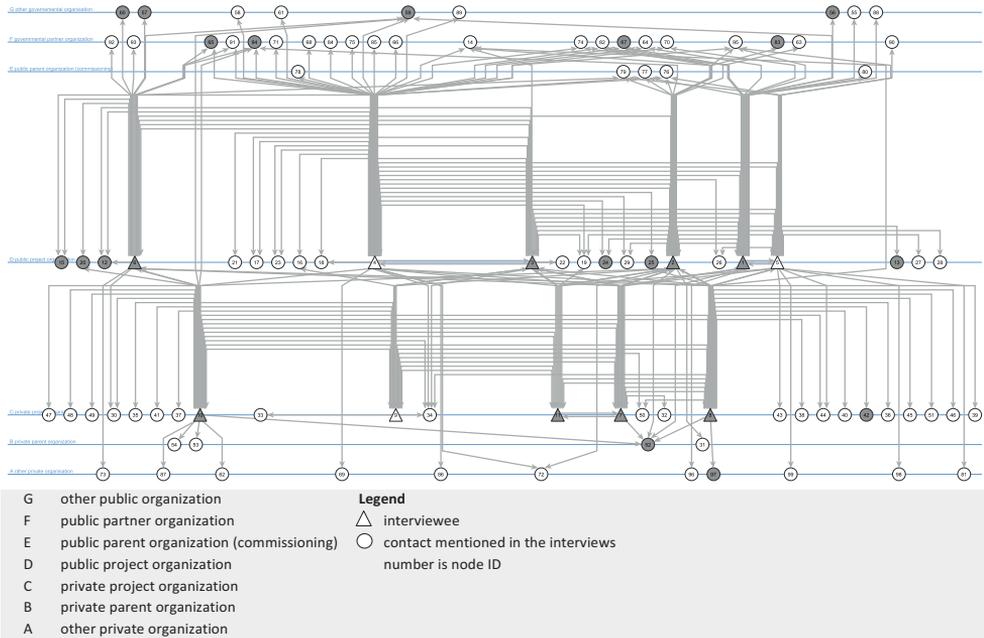Figure 7-12 People who are informed (grey nodes) in Case II

Legend
△ interviewee
○ contact mentioned in the interviews
◉ contacts who are informed by the interviewees
number is node ID

Figure 7-13 People who are consulted(grey nodes) in organizational context, Case II

G	other public organization		Legend	
F	public partner organization		△	interviewee
E	public parent organization (commissioning)		○	contact mentioned in the interviews
D	public project organization			number is node ID
C	private project organization			
B	private parent organization			
A	other private organization			

7.3.4 Influence of the actors

Both the nature of the relationship as well as the effect of the relationship on the project was asked per contact. In the interviews for Case II, 99 people were mentioned (nodes), the network of Case II counts 215 links. Of these links (relationships) 113 relationships were indicated *positive* and 77 links *neutral.* Together these relationships form 88% of the total connections in the network. The remaining 12% (25 links) was indicated as *negative* or *both positive and negative* (Figure 7-14a). Ten relationships were indicated to have a negative effect on the project (Figure 7-14b). Most of these relationships were mentioned by the public project management team (8 out of 10). These relationships are connected to unique nodes. Three contacts that were indicated to have a negative effect on the project by one of the interviewees, were also indicated by other interviewees. For eight contacts with *negative* or *both positive and negative* relationships other interviewees indicated their relationship with this contact *positive.*

One contact with a negative influence on the project is an employee of the public parent organization. The origin of the conflict was a conflict of interest between the responsibilities in the line and the project. This conflict was mentioned by the public stakeholder manager, who also mentioned that the contact had a voluntary job as chairman of a group of citizens with a spe-

cial interest in the protection of nature. He suggested that this was of influence and explained the non-cooperative attitude. The conflict was escalated to the provincial executive who was responsible for both the line interests as well as the project. The conflict was solved by the final judgment of the provincial executive, which was binding for both line and project organization. Though the public project director did not mention this specific issue, he did mention his specific condition for accepting his assignment: to have only one (1) responsible provincial executive (and not two different with separated responsibilities – scope and money).

From supporting public organizations four other negative influences were mentioned. One of those was also involved in the dossier mentioned above. The other three involved issues addressed at the node-connection analysis in Section 7.3.3 (future owner and railway company). From other public organizations only one person with a negative effect was mentioned. The tension was caused by the lack of communication about another project with physical interfaces. Due to the unexpected execution of this project, Case II was confronted with additional costs. This could have been avoided if there had been better interface management and communication.

The public interviewees mentioned two negative influences on the project coming from the private project organization (node 10 and 30). Both persons were also mentioned by interviewees from the private project organization, but labeled positive. From several interviews it became clear that these employees were very expressive in their positive as well as in their negative comments. In the beginning of the project there had been a lot of internal tension in the private project team, which had been escalated to the chairman of the board. Eventually the removal of this tension cleared a lot of issues and the involved people learned to understand and even to appreciate each other. Their conflict in the design phase had helped to build trust and the positive relationship that came out of it, was mentioned as one of the success factors in the execution phase.

From external private parties two relationships were classified negative: two of the public project team members mentioned the Utility companies and from the private project management team a supplier was mentioned whose business processes did not match the project requirements (node 87). The private interviewee (node 10) mentioned that it had caused them a lot of effort to agree on the scope. The interviewee closed his remarks about this supplier by mentioning that this company was the first he would call for a new project. Interviewee_10: *"They have learned much from the mistakes made. I would contact this supplier again for a new project, just because they will not make these mistakes again."*

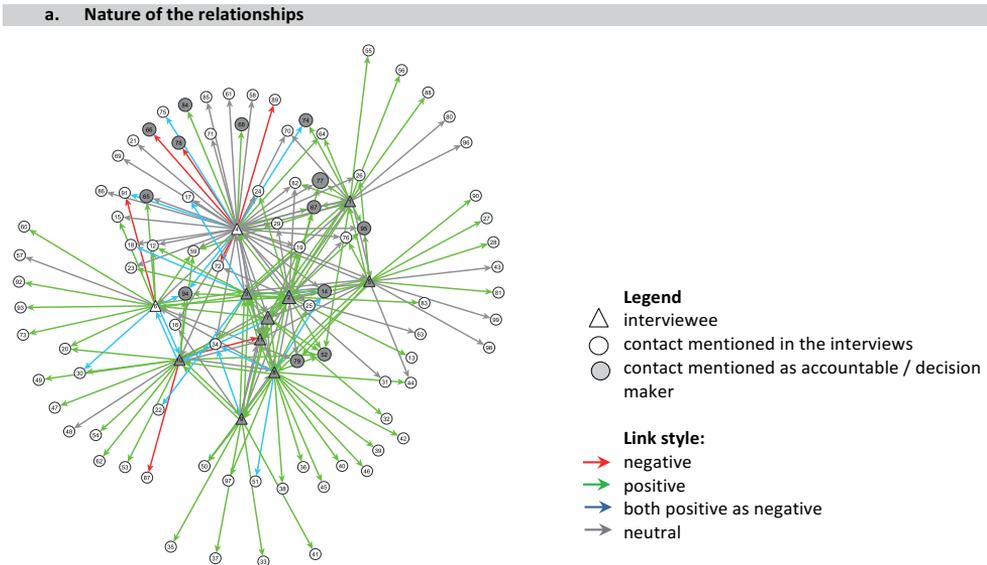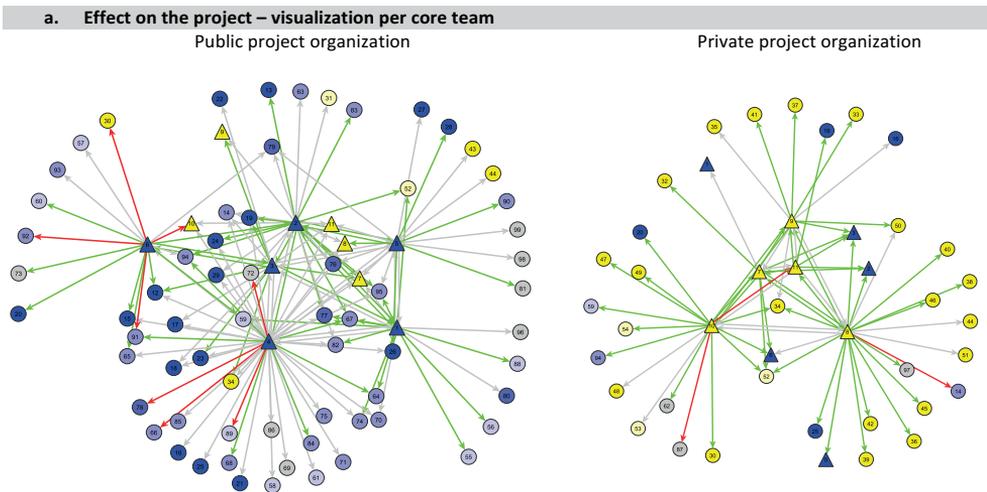Figure 7-14a Nature and effect of relationships in Case II

a. **Nature of the relationships**

Legend
△ interviewee
○ contact mentioned in the interviews
⬤ contact mentioned as accountable / decision maker

Link style:
→ negative
→ positive
→ both positive as negative
→ neutral

Figure 7-14b Nature and effect of relationships in Case II

a. **Effect on the project – visualization per core team**

Public project organization   Private project organization

Because of the objective of this study, improving project performance, negative impacts are analyzed. But what is most important in this case is the large amount of positive contacts. In the relatively small core (especially formed by nodes 7, 9 and 10) of the private project organization, the contacts were positive (Figure 7-14b right). Also in the public organization many positive contacts were found. Again, a small core can be distinguished (node 2 and 3). The core in both teams consists of highly experienced professionals (over 15 years). The two inter-

viewees who experienced negative effects for the project were the relatively young employees (approximately 10 years of experience).

7.4 Case III: Construction of a new national road, partly in a tunnel

The project organization of Case III consisted of a separate public and private project team. The public project team was led by the public project manager and was formed according to the general management model of the Dutch national government. The people of the core management team are supported by their own team. In this project an extra role was added to the project management team: the manager Technical Installations. The private project team was led by the private project manager. At this team another division of responsibilities in line with the specific task of the private project organization lead to different functions in the project management team. The members of the project management team had their origin in one of the three major contractors that together formed a consortium for this particular project. The private project manager was assigned by the private project board, which consisted of the managing directors of the contractors participating in the consortium.
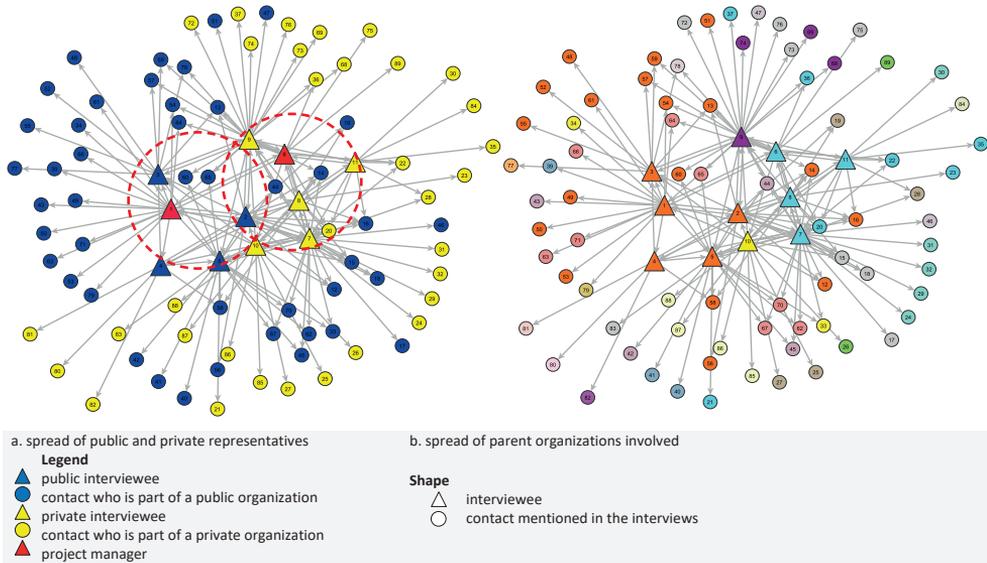
Interviews were held with the public project manager and private project manager and key-players indicated by them: on public side the contract manager, the relational stakeholder manager, the technical manager and the manager technical installation and on private side the contract manager, the process manager / relational stakeholder manager, the manager Technical Installations, the contract manager and the project secretary (clerk). The private project team had been almost the same from the start, while the people on the public project team had changed over the years. Like in the other projects project interviewees had different views of the role of others in the project, naming the roles of the same people differently.

7.4.1 Position and attributes of nodes

The network of Case III is shown in Figure 7-15. The triangle nodes represent the people who were interviewed. The links are directed and based on the perspective of the interviewee. Similar to Case I and II a realistic approach was used to define the boundaries of the network. Those boundaries that are perceived as real by the core team members of the combined project organization are identified. The people in this network are connected through the project and the expected contribution to the project goals. They represent several parent organizations. In this project 13 public and 13 private organizations were involved. The core of the project network is formed by those who have the highest degree of centrality. The core in this network (Figure 7-15) is formed by the public interviewees at the left side of the core and the

Analysis of relationships 179

private respondents at the right side of the core. In the middle of these two groups the public contract manager is situated, together with the private clerk and manager Technical Installations. Their position in the network shows that they are well connected to the other interviewees and through them with the rest of the network.

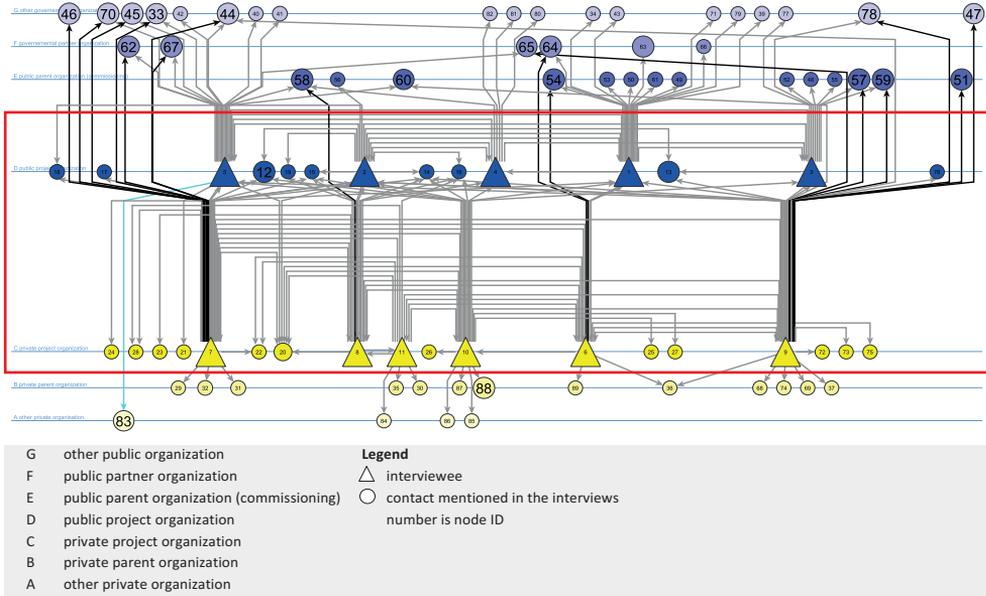Figure 7-15 Social network of the project management team of Case III

a. spread of public and private representatives

Legend
△ public interviewee
● contact who is part of a public organization
△ private interviewee
● contact who is part of a private organization
▲ project manager

b. spread of parent organizations involved

Shape
△ interviewee
○ contact mentioned in the interviews

Considering the betweenness of nodes, the project managers of the public and the private project management team are well connected to their own team (Figure 7-15). They are partially connected to the project management team of the partner organization in the project and they connect to their own set of unique nodes in the project.

7.4.2 Analysis based on the connections

Next it is considered who is part of the project organization and who is not. This can be easily recognized when the visualization is changed. Again, instead of sorting the nodes based on their centrality degree, the nodes are sorted based on the organizational context. This positioning of the nodes is shown in the next graph (Figure 7-16 and Appendix VIII). The public private project organization is outlined in a red box in the center of the graph (line C and D). The indicated contacts in the public parent or other public organizations are positioned above the project organization (nodes on line E and F). The contacts in the private parent or other private organizations are positioned beneath the project organization (line A and B). A few connections are highlighted to support the findings that are mentioned in this section.

Figure 7-16 Nodes in project organization context, with some highlighted connections, Case III (also in Appendix VIII)

G	other public organization	**Legend**	
F	public partner organization	△	interviewee
E	public parent organization (commissioning)	○	contact mentioned in the interviews
D	public project organization		number is node ID
C	private project organization		
B	private parent organization		
A	other private organization		

From this graph (Figure 7-16) the connections in the network of Case III are analyzed. The horizontal links (from node to node on the same line - line C or D) are of an operational nature as they represent contacts between people in the project organization. The interviewees of the public project organization maintained multiple connections to other public organizations and in particular to their parent. The members of the public project management team have little overlap in the connections they have. The same applies to the connections of the private project management team outside the project organization. The private team members indicated each other, but only few others in the project organizations.

Figure 7-16 shows that there is only one connection from the public project organization to a node on the private side not being part of the involved private organizations (node 83). This is a connection from the public external relationship manager to an organized group of civilians who did not want the project to be carried out. Such a contact is typically of public concern.

Seventeen contacts were mentioned by interviewees from the private project management team to public organizations, not being part of the project organization (black links in Figure 7-16). Three of those contacts were not mentioned by the public interviewees (node 46, 47, 51). Two contacts are employees of a safety department (the project is situated in two different safety regions). In the public parent organization one contact was mentioned only by a private interviewee

(node 51). This is a member of the department with a specific technical expertise. The other contacts in public organizations were also mentioned by interviewees from the public project management team. Five contacts in the public parent organization were mentioned by the public and the private project management team (line E, node 54, 57, 58, 59 and 60). The main purpose of these contacts was alignment about the functional specifications. Four contacts in the municipality which was a partner in the project for the public project organization were mentioned by the public and the private project management team (line F, node 62, 64, 65, 67). The main purpose of these contacts was alignment with a project of the municipality with a physical interface with Case III. And five contacts in other private organizations were mentioned by public and private project management team members (line G, node 33, 44, 45) 70, 78), mainly representatives of municipalities out of this region. Their role in the project is given in Table 7-1.

Table 7-1 Contacts in public organization mentioned by both public and private interviewees

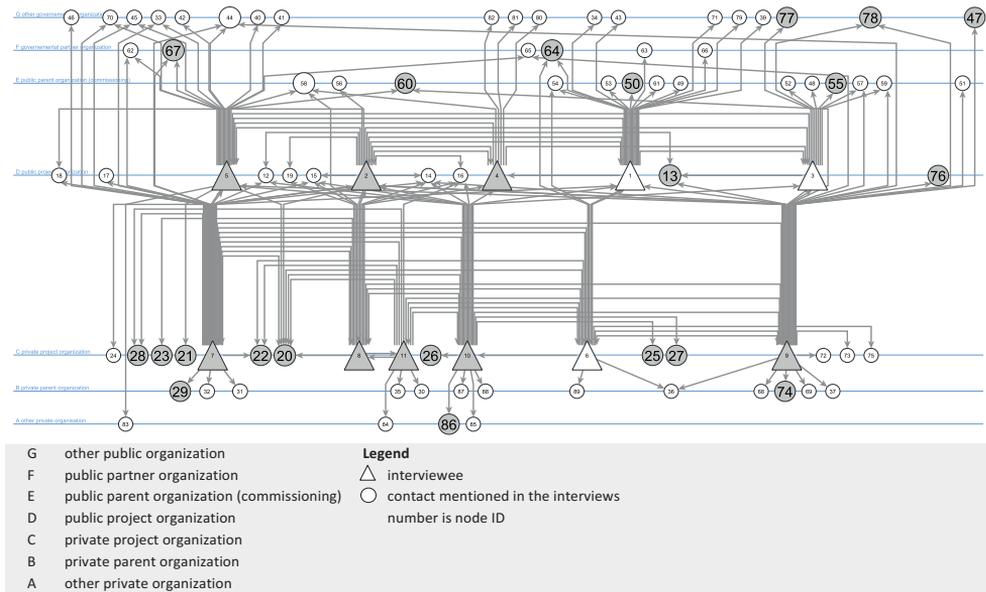| Id.	Role in public parent	Id.	Role in public partner	Id.	Role in other public
54	internal client	62	representative municipality A	33	represent. municipality B
57	ass. man. traffic control sys.	64	director of department	44	assessor HSE municipality C
58	representative future owner	65	coordinator safety	45	represent. municipality C
59	representative future owner	67	project leader nearby project	70	represent. municipality D
60	representative future owner			78	employee safety department

7.4.3 Purpose of the connections based on responsibilities

The next thing to examine is the purpose of the contacts as mentioned by the interviewees based on four possibilities extracted from the RASCI method. The next graph, Figure 7-17, shows the people in the network that are indicated as supporters of the interviewees positioned in the organizational context. The tasks these people have in the organization are supportive to our interviewees and are considered to be on operational level. Based on the outcomes of the supporters' works, which could be information or a product, the interviewees could do their task and take their responsibilities. In the private project organization most of the supportive nodes are part of the project organization, as expected. In the public project organization the graph shows the same pattern. In the interviews it was observed that these supporting connections were not following the functional lines of the project organization. The interviewees hardly indicated their own team members. The members of the teams though are indicated by others, meaning that for instance the members from the contract team were not mentioned by the contract manager but were mentioned by the technical manager.

At the top of the graph eight people in public organizations were appointed as supporters. The other supportive nodes are representatives of departments (line E) and organizations (line G)

with responsibilities in general processes in their organizations in the operational phase. These contacts had to support the team in the execution phase with information and requirements. After delivery two contacts (node 55 and 60) would become asset owner of specific assets. One contact (node 50) is an employee of the parent organization whose formal position to the project is not clear. His authority in a specific area made that he had to judge over the quality of the delivered result and advice the public authorities accordingly.

Figure 7-17 Nodes indicated supporting Case III

G	other public organization	
F	public partner organization	
E	public parent organization (commissioning)	
D	public project organization	
C	private project organization	
B	private parent organization	
A	other private organization	

Legend
△ interviewee
◯ contact mentioned in the interviews
   number is node ID

Interesting is the indication supportive to some contacts that are situated in other public organizations (node 47, 77 and 78). The interviewees who labeled the purpose of their contacts supportive mentioned specific deliverables of these contacts; in this case a training program and an ICT functionality. Although these deliverables were indeed required in the operational phase, there was no (contractual or enforceable) provision for the necessary contributions from the project to these contacts. This ambiguity lead to tension in the relationship, reflected in the nature and the effect of the relationships. Interviewees were either positive about the cooperative attitude or negative about the lack of urgency in the activities of the contact.

The two contacts in the supportive public organization (node 64, 67 on line F) were both involved in the project of the municipality that was related to Case III. The interviewee named mutual interest of which he distilled a supportive role of this contact for the project: *"This contact needs my project to achieve his project and my project requires his organization for the*
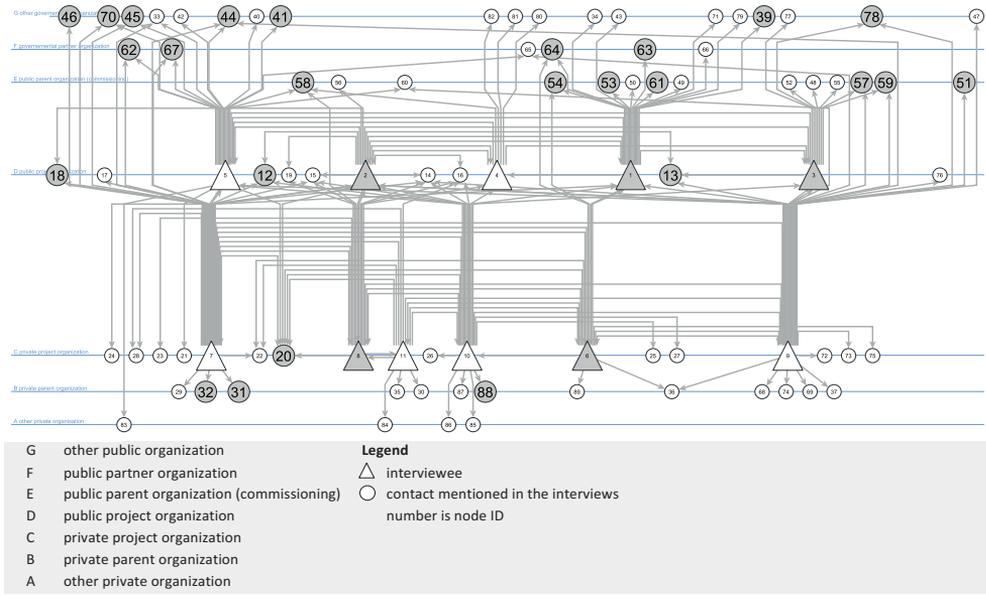
licensing. This contact can help the project by using its influence in the parent organization or by providing information".

The three nodes that are supportive people from private companies outside the project organization are an insurance company employee (node 86), a senior advisor Assurance and Quality (node 29) who provides the project organization with Quality standards and procedures and a process manager who occasionally assisted the team (node 74).

In the next graph (Figure 7-18) the contacts that are accountable (decisionmakers) are marked in the project network. On the private side four interviewees, who are considered part of the private project management team, were not indicated as decision makers. Two of those are staff members, and as such also positioned in the organizational graph. The third is the manager Technical Installation. From the interviews it became clear that the position of this interviewee was very indistinct. He is a member of the private project management team but also considered a director of a sub-group in the project organization responsible for a specific element of the project. The business unit directors of supplying sub-concerns of these companies (together in node 88) were appointed decision makers by the clerk. The clerk supported several committees where the input supplying concerns were aligned and operational decisions were made. Both public and private project teams had formed their own board, but the function of the board was different: decision making (public board) or gaining support (private board). Though the private board was not appointed accountable, two directors of one of the parent companies in the consortium were indicated as accountable (node 31, 32) by an employee from their company (his parent company) who was a member of the private project management team. This interviewee complimented the positive effect of the decisiveness of the director of his parent organization and was very negative about the indecisiveness of the (chairman of the) board. His view on the decision making process (who, when, how and about what) was clearly different from the others in the project management team.

At the public side no less than 18 persons were appointed as decision makers. The Accountability in the public parent organization is differentiated between several functions. Differences are made between (scope) decisions without changing time and budget constraints (node 54), decisions which effect on time and scope (node 61), a binding advisory opinion on the safety of the asset (node 51), the acceptance of prepared decisions by the general director of the parent organization (node 53) and the acceptance of the asset that is delivered (particular parts or systems of the project, node 57, 58, 59).
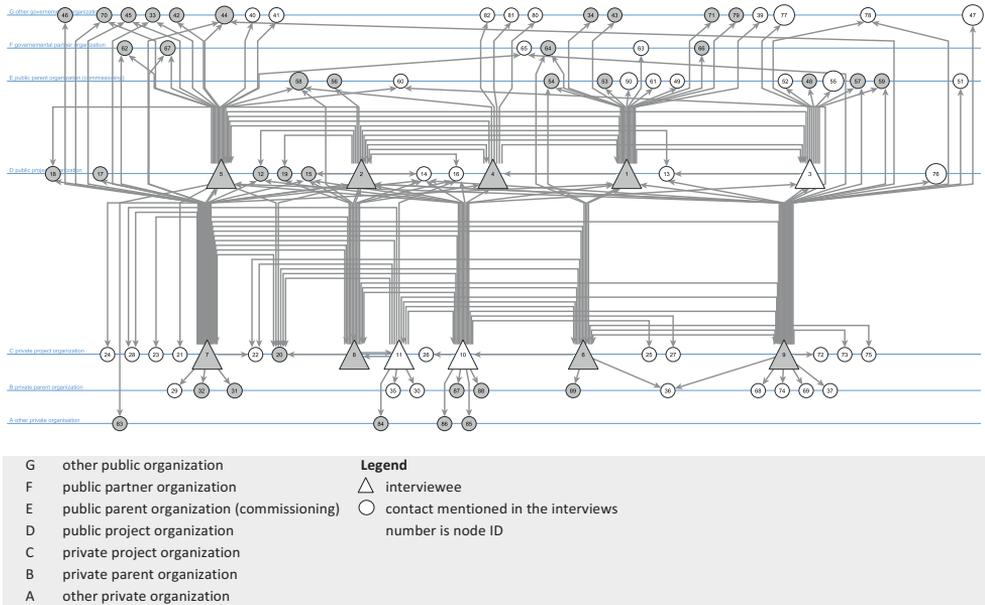
Figure 7-18 Decision makers (grey nodes) and the relationships to the project manage

G	other public organization		**Legend**
F	public partner organization		△ interviewee
E	public parent organization (commissioning)		○ contact mentioned in the interviews
D	public project organization		number is node ID
C	private project organization		
B	private parent organization		
A	other private organization		

The private project team indicates that it needs several decisions outside the project team, partly coming from public stakeholders. The contacts in the public partner organization (line F) are mentioned by both public and private interviewees (Figure 7-18), except for the Mayor of the municipality (node 63). These persons are important in the decision making process in the licensing procedure. This is also the case for three contacts in other public organizations (line G, node 44, 45, 46, 70). In the decision making process a new public organization was mentioned: the water board (node 39, 41). The project needed a separate license of this public organization to authorize the new (ground) water system.

The contacts that are Informed about the project are spread in the project environment. Over forty contacts are informed about the project (Figure 7-19). Several people (22 contacts) that are primarily indicated as accountable are also informed.

Figure 7-19 People who are informed (grey nodes) in Case III

Figure 7-19 People who are informed (grey nodes) in Case III

		Legend
G	other public organization	△ interviewee
F	public partner organization	○ contact mentioned in the interviews
E	public parent organization (commissioning)	number is node ID
D	public project organization	
C	private project organization	
B	private parent organization	
A	other private organization	

The contacts of who the purpose of the contact is to Consult are shown in Figure 7-20. In 21 occasions these contacts are also accountable (9), informed (2) or supportive (10, grey nodes in Figure 7-20). The contacts that are solely consulted (14, blue nodes in Figure 7-21) are either senior employees in the parent organization or experts from other organizations (node 72, 73, 75, 80, 81, 82).

Based on the interviews and the connections in these graphs it can be concluded that there was much communication in this project, but the purpose of the contacts and the expected contribution of the contacts to the project goals was ambiguous. In this project acceptance of the system assets of the project was bound to a complicated procedure. Many stakeholders were somehow involved in this process. Their role was pointed out in the interviews, but their responsibility was not always clear. Neither was their position in the parent organization. There was no indication of a strategic approach of the involved divisions. A joint escalation level seemed to be missing. The emergency services were an important external stakeholder in this project – in the transition phase as well as the exploitation phase. Though the public project management team did not have contact with the emergency services. The formal responsibility after completion was in the parent organization, not in the public project organization.

Figure 7-20 People who are consulted in organizational context, Case III

		Legend
G	other public organization	△ interviewee
F	public partner organization	○ contact mentioned in the interviews
E	public parent organization (commissioning)	○ contact appointed consulted, next to I, A or S
D	public project organization	○ contact solely appointed consulted
C	private project organization	number is node ID
B	private parent organization	
A	other private organization	

7.4.4 Influence of the actors

Both the nature of the relationship as well as the effect of the relationship on the project was asked per contact. In the interviews for Case III in total 89 people were mentioned, the network of Case III counts 172 links. Of these links (relationships) 28% is indicated as *negative* or *both positive and negative* (Figure 7-21), 73% of these relationships are indicated as having a *negative* effect on the project (Figure 7-21). Further analyzing this data shows that 34% of the negative effects are directed to nodes within the public private project organization. Thus 66% comes from outside the public private project organization. Table 7-2 reveals the attributes of the nodes whose connection to the project is indicated as negative.

As in Case II, interviewees agree on the contacts that have negative influence on the project. The private project team mentions eight people from their own supporting organization. Only two of them were mentioned by the public project management team. From the public project organization seven persons were mentioned by the private interviewees. Two of those contacts were frequently mentioned because of their negative influence within the public private project organization.

Table 7-2 Connections with a negative effect on Case III

Id	Role	Position of parent	Support	Decision maker
32	business manager	B private parent organization	no	yes
53	advisor of the director of national infrastructure	E public parent organization	no	yes
61	regional director of national infrastructure	E public parent organization	no	yes
62	representative of municipality B	F public partner organization	no	yes
67	project leader of project with physical interfaces	F public partner organization	yes	yes
44	assessor health and safety of municipality A	G other public organization	no	yes
46	employee safety department	G other public organization	no	yes
78	employee of the safety department	G other public organization	yes	yes
84	regional manager of the union	A other private organization	no	no
37	business manager	B private parent organization	no	no
89	business manager	B private parent organization	no	no
52	employee of the national tunnel department	E public parent organization	no	no
42	secretary of municipality A	G other public organization	no	no
77	director department of incident management	G other public organization	yes	no
29	senior advisor Quality Assurance	B private parent organization	yes	no

Some observations made in the interviews can support the understanding of connections in the network. The public project manager hardly mentioned names, only functions, while the private project manager mentioned names and no functions. This might illustrate a difference in organizational culture. This cultural or personal difference was also noticeable in the interview in the focus of both project managers. The focus of the private project manager was on the project management team and the effect of the team on the own project organization. Every working day the private project manager was at the project office. His only connection with the public organization was with the public project manager. The success criteria of the private project manager seem to be *customer satisfaction* and *iron triangle*. The focus of the public project manager was on external persons and their effect on the project. His only success criterion seems to be *satisfying stakeholders.* The difference in presence of the public project manager at the project office with the presence of the private project manager can also be a reflection of this. The public project manager was maximally 2 days a week at the project site.

From the interviews it was also noticed that people that valued contractual arrangements high experience a lot of negativity, *"they do not see it right"* or *"they do not behave as agreed"*, or just became very passive, *"it is not in my mandate to decide about anything – I just advise".* It seems that both project managers tried to narrow the negativism by limiting the tasks, removing the negative people from the project or involving new people near the negative source. Passivism is also annoying for the contract partner, but often less noticeable than negativism.

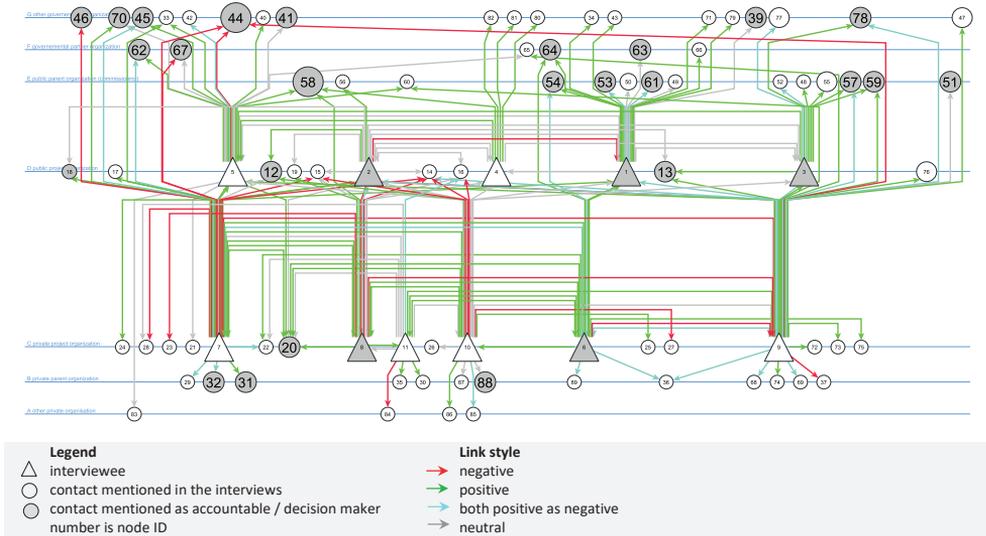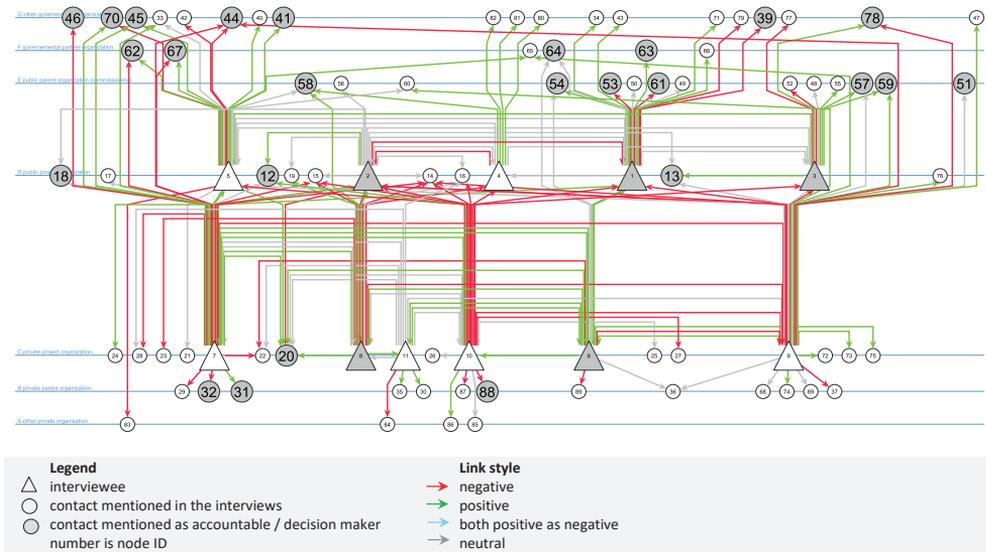Figure 7-21a Nature and effect of relationships in Case III

Figure 7-21b Nature and effect of relationships in Case III

7.5 Comparing the networks

This part of the research was set up to examine the influence of the actors in the environment of the combined project organization, and in particular actors from the public parent. By means of an ego-centric approach the network of the core of the combined project organization is mapped for three cases. In this section, the outcomes of the three cases are compared in terms of network layout, effects of the relationship and influence on project performance.

7.5.1 Network layout

Social network analysis is useful to analyze the networks in the cases and enables comparison of the cases. The constructed networks consist of people from different parent companies, varying from 17 to 46 different parents. The people are connected to each other through the project. In the project networks some nodes are closer to the core, they are connected to more than one interviewee.

In Case I five central nodes are distinguished, the other nodes are in the periphery of the project network. The network of Case II is larger and next to the three central nodes, seven nodes connect the center with the periphery. In the network of Case III the public and private team in the core of the network can be distinguished.

The organizational context graphs illustrate the number of contacts the project organizations have with the parent organizations. In Case I and II the project management teams have limited contact with the parent organization. This is very different for Case III, where the project management teams are much more in contact with their parent organizations.

7.5.2 Relationships and effects

The objective of this in-depth descriptive part of the research, performed in the network of the public and private project management teams, was to accurately describe the relationships of the project management team with stakeholders, the purpose of their involvement in the project and their influence on the cooperation.

The relationships in Case I were dominated by the relationships with the utility companies (Table 7-3). Public and private respondents agreed about the negative relationship, but the effect was more negative in view of the private project organization interviewees. In Case II interviewees experienced little negativity from outside the project organization as well as inside the organization. The potentially negative relationships were consciously managed by the project management team. In Case III interviewees mentioned limited negative relationships but the effect of some relationships was called negative. An interviewee stated about such a contact: *"His attitude is*

cooperative, but the results are not what it should be. His focus on deadlines is insufficient". In all cases negative effects on the project were reported if the contact was accountable for a specific sub system in the projects. In Case I this was the execution of a specific sub system as an inter-mediate step in the execution of the project. In Case II these could have been the acceptance of sub-systems as a new asset for the future operating organization and in Case III these were the authorizations the project needed for acceptance of sub-systems. In all cases the Accountability of the contact was on the decisions about a sub- system, not about the project.

Table 7-3 Nature of relationships in the projects

	Case I	Case II	Case III
Number of identified relationships	59	215	172
- Internal relationships	24	122	99
- External relationships	35	93	73
Percentage of external relationships			
- Positive	11%	38%	48%
- Negative	51%	6%	10%
- Both positive and negative	3%	6%	25%
- Neutral	34%	49%	18%
Percentage of external relationships			
- Positive effect	29%	40%	40%
- Negative effect	6%	8%	23%
- Neutral effect	66%	53%	37%

Also the requirements of the future owner(s) were a source of tension. Their acceptance of the project was necessary for the transition to the operational phase. The project management teams were struggling with the way they should be involved, without losing grip. The framing of the input of the operational department or organization by the project management team was different by the interviewees of all cases. If the requirements are framed as supportive by the public project management team, like *the stakeholder has to provide us with requirements,* the relationships were perceived less negative. If the role is framed as *the stakeholder has to accept the project* (accountable), more tension was experienced.

All projects suffered from their own specific technical complex issues, like polluted soil (Case I), safety issues (Case II) or ICT (Case III). In the teams dealing with these issues more tension was met. In all cases the project managers of public and private organization did not demonstrate spe-cial attention to these issues. A positive contribution to the project comes from 'professionalism'. Contacts with adequate knowledge and a constructive attitude (in this context 'best for project') were complimented by the interviewees. Interviewee: *"This issue was new for our organization. The stakeholder showed understanding and helped us to achieve an acceptable application".*

7.5.3 Project performance

In the previous chapter (Chapter 6) the cases were systematically compared to reveal patterns that indicate systematic inefficiency or ineffectiveness in the construction of projects with a public and private project management team. From this, recommendations were made for enhanced project performance. But what about the performance of the studied cases? Case I was over a year delayed in the design phase. The execution phase was successful for the public project manager, but he doubted if the project was profitable for the private partner. Case II was a project success for both partners, it was delivered in time and within budget. The project teams had experienced tension in the design phase, but expressed that the discussion in the design phase had contributed to a successful execution. Case III was delayed in the design phase and had a small delay in the transition to operational phase due to licensing issues.

7.6 Concluding remarks

In order to contribute to enhanced project performance, elements that disturb or support the relationship between public and private partners in an infrastructure project are the subject of this PhD research. The public and private project management teams of Case I, II and III all went through a troublesome period but managed to finish the project together. The success criteria for the project delivery organization were identified in the Q-studies (Chapter 4 and Chapter 5). The cases studied in Chapter 6 and 7 can be considered successful on some criteria, especially those referring to product result like satisfying the needs of users and stakeholders, fit for purpose and fulfilling specific political or social aspects.

In this chapter the contacts, their features and the connections that relate one individual to another are studied in detail. Together with Chapter 6 (cross-case analysis), this social network analysis identified the connections and their specific influence on the success criteria of the project. The connections are not the properties of individuals, but the properties of the relational systems of individuals.

The data in this sub-study are the opinions of the interviewed individuals. In the following chapter, Chapter 8, the analysis and the identified patterns in the relational systems of this sub- study are used to formulate a generalized image of the combined public private project organization. This generalized image, accompanied by some explicit recommendations are validated by experts from public and private project organizations.

References

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Chapter 8 The Public Value Chain

Abstract

The objective of this research was to investigate the influence of parent organizations on the cooperation between public and private partners. After analyzing cases, exploratory interviews, sorting out the essence of project management success for public project managers and researching the network in three cases, now the results will be integrated. In this chapter recommendations for enhanced performance in public private project organizations are formulated, including the public Value Chain with primary and support activities. The Value Chain with supporting recommendations is presented to a panel of experts, who were requested to reflect on the recommendations. The expert meeting was attended by 21 experts, representing the viewpoints of the client-owner, the public project manager, the private project manager and the private parent organization. For each viewpoint at least four experts attended the meeting. Based on their reflections, the recommendations were further developed. The final recommendations were presented to the experts after the meeting by means of an online survey:

1. After contracting, jointly organize the combined project organization for an efficient and effective production. Explicit attention should be given to the design of the Value Chain.
2. Pay conscious attention to Human Resource and Knowledge Management.
3. Be transparent about the public roles and organizational context of functions towards the private partner, in particular about the public roles licensing authority, owner-operator and client.
4. Act jointly towards external stakeholders. Validate the contractual design jointly to make sure the combined project organization is producing the right result.
5. Create the workflow towards asset-owners jointly, including decision-making.
6. Put the public project organization on a clear distance from the licensing authority, so the public project partner can actively contribute in procedures without conflicts of interest.
7. Make clear distinction between project management success and product success. Provide balance between management of the creation and the controlling activities.
8. Appoint a *Project* pivot for both partners, visible and approachable for the partner.
9. Organize on public parent level a multiple project, multiannual agenda with the owners of public assets.

8.1 Introduction

This chapter is about validation and applicability of the findings. It presents a more general, non-project specific approach in which the processes are explicitly evaluated on their potential contribution to enhanced efficiency and effectiveness in public private project processes. In this part the aim is to answer the last research sub-question: *To what extend can the these insights be used to improve the efficiency of the public and private actions?* To answer this question, the findings of the sub-studies are combined.

Figure 8-1 Composition of sub-studies
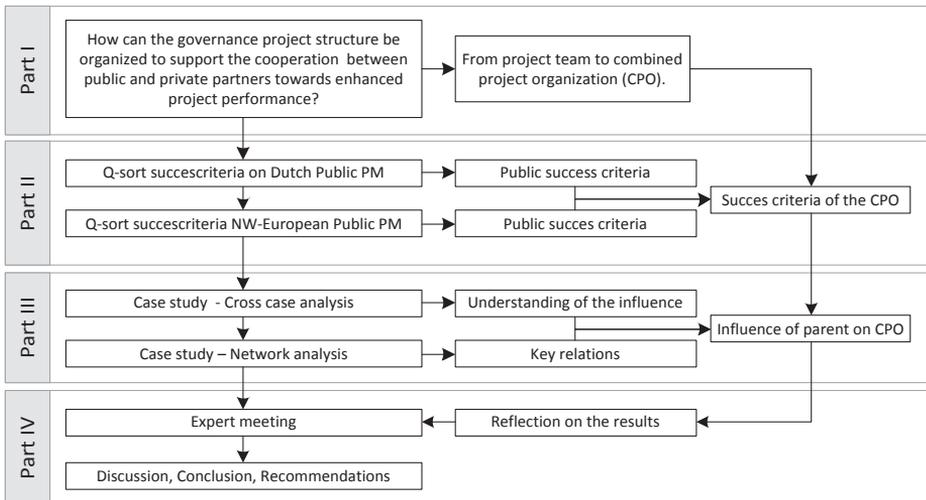
Several sub-studies were conducted to research collaboration between public and private partners in projects (Figure 8-1). The purpose of each sub-study was different and thus identified several key issues and key variables. The public project delivery organization is positioned outside the parent organization, as confirmed by insights from literature (Chapter 2), case analysis and exploratory interviews with public project managers (Chapter 3). The public project manager is leading the public project delivery organization. The Q-studies (Chapter 4 and Chapter 5) identified the success criteria of the public project manager. After the procurement phase, the public project delivery organization and private project organization together form a combined project organization (CPO). The CPO executes the project. This CPO is acting in a network of stakeholders, needed in the process towards completion of the objectives, including stakeholders in the parent organizations. The social network analysis (Chapter 6 and Chapter 7) identified specific strengths and weaknesses in the connections. The cross-case

analysis led to five assertions, all of which indicate improvements at the interfaces with the purpose of increasing efficiency of the CPO.

From this, the public Value Chain of activities in the CPO is developed, which is presented in Section 8.2. To validate the use of the public Value Chain it is presented to a panel of experts. In Section 8.3 the expert meetings are explained. Based on the responses some adjustments are made. Section 8.4 clarifies the reflection of the experts and the recommendations accompanying the public Value Chain.

8.2 Developing the public Value Chain

The CPO is the organization that is formed after the procurement phase. The project delivery organization has contracted a project partner for further assistance in delivering the project. The CPO is considered for all combined project organizations after procurement, regardless the contract form between partners. This approach is confirmed by Suprapto (2016) who demonstrated that the contract is of no significant meaning for collaborative practice within partnerships in the construction industry. (Suprapto, 2016)

8.2.1 The Value Chain of the CPO

Value Chain analysis is a business strategy approach by Michael Porter to analyze specific activities or processes through which firms can create value and competitive advantage (Porter and Millar, 1985). A Value Chain is a chain of activities that a firm performs in order to deliver a valuable product to the market. In infrastructure projects the deliverable is a physical product: a road, a railway, a bridge, et cetera. Value Chain Analysis distinguishes primary processes or activities and support processes or activities. The chain of activities that the CPO performs in order to deliver a valuable product for society has similarities and differences with Porter's Value Chain. A key difference is that the project will cost money to the parent organization instead of generating money as in a commercial setting (see also literature on POO and PBO in Chapter 2). The commercial operational activities that Porter distinguished, are suitable in commercial settings where organizations produce goods. In these organizations the primary activities from production to market are Inbound Logistics, Operations, Outbound Logistic, Marketing and Sales and Service. These activities do not fit the combined project organization, responsible for infrastructure projects. The primary processes constitute the 'core business' of the organization. To translate the commercial Value Chain to a Value Chain that suits the combined project organization for infrastructure projects, those activities necessary to create the project result have to be taken into account, starting in the pre-construction phase (Cox *et al.,* 2006).

These activities are: Legalize, Prepare, Design and engineer, Construct and Hand-over, shown in Figure 8-2, on the right (Smyth and Pryke, 2008). These activities are shortly explained:

- Legalize is the activity that fulfills all legal preconditions required for the successful completion of all other stages. From the creation of a special legal basis for the project to obtaining building and opening permits.
- Preparing involves all activities necessary to create a suitable situation for constructing the project result. This includes mapping the quality of the current situation and removing possible obstacles in it, for example, assets of others.
- Design and engineer refers to activities aimed at developing the product of the CPO and construct refers to the actual building activities.
- The final handover activities consist of testing, delivering and transferring the assets to the owners.

Figure 8-2 Porters Value Chain (1980) (left), Public project Value Chain by this research (right)
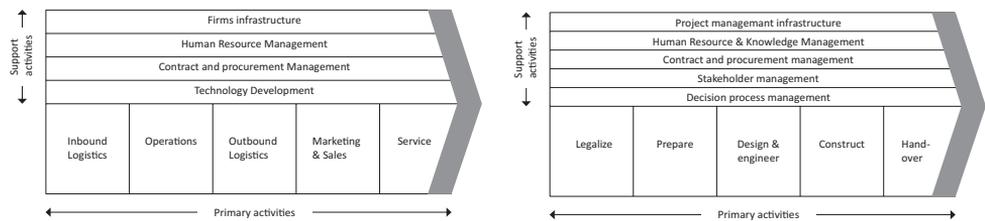
Along with the primary activities, the value chain consists of support activities. The support activities Porter mentions are suitable for a permanent organization. The support activities of a CPO support the temporary CPO, and should be complementary to the support activities of the parent organizations. From the sub-studies the equivalents for the support activities in the CPO are derived: project management infrastructure, Human Resource and Knowledge management, Contract and procurement management, Stakeholder management and Decision process management. These equivalents are explained next.

- **Project management infrastructure:** Porter mentions the management activities next to the primary and support activities. For the CPO the project management practices are considered more dominant and thus part of the Value Chain. Porter's management comprises forecasting, planning, organizing, leading, directing, coordinating and controlling effort for the purpose of accomplishing the goal. These activities, also mentioned in the PMBOK, put much emphasis on tools and techniques that help to control the activities. Searching for efficiency these control activities have a strong influence on the project activities in public infrastructure projects.

- **Human Resource and Knowledge Management:** Findings in both part II and part III justify Human Resource and Knowledge Management as support activities in the CPO. Public project managers sorted the success criterion *personal growth and development* ranked around -1, not very important, not unimportant either (Chapter 4 and 5). Although technology is needed in the primary processes, the development of technological knowledge is not an activity for the CPO. But in the analysis of relationships (Chapter 6 and 7) emerged that the organization of the right knowledge in the team is important for effective processes. The response to too little knowledge was to add more people, with which new discussions entered the CPO. Therefore, a position for HRM and Knowledge Management seems justified in support activities of the CPO. These activities refer to addressing the essential knowledge fields for the CPO and ensuring these in the project organization. The parent organization should provide the project with a (for the parent strategic) fulfillment of the knowledge question and provide the organization with proper Knowledge Management (Leendertse, 2015). Based on this it is stated that the equivalent of Human Resource Management for the CPO is Human Resource and Knowledge Management.

- **Contract and procurement management:** Prior to the composition of a CPO procurement is an important process (Cox *et al.,* 2006; Pryke and Smyth, 2006). A public private partnership can only be started after a careful tendering procedure. Though procurement activities (tendering) are important in construction industry, they are supporting the activities that construct infrastructure. After composition of the CPO contract management supports the primary activities by monitoring the compliance with the contractual agreements made. Procurement is still relevant for the private project organization with respect to subcontracting.

- **Stakeholder management:** The success criteria of public project managers uncovered that the Dutch public project manager endeavors the CPO to create maximum value for others (Table 8-1). The criteria that referred to *satisfying stakeholders* scored very high (Chapter 4 and 5). When discussing the processes towards product success the CPO has to deal with triangular relationships, insufficient purposeful relationships and (too) many people involved, as uncovered in the network analysis (Chapter 6 and 7). The ambiguous relationship with parent (multiple responsibilities in the parent) can partly be tracked back to unclear relation to the project's product (or sub-systems). Stakeholder management as supportive process can contribute to clear involvement of people from outside the project organization (their roles and responsibilities). Stakeholder management contributes to more effective processes without losing support of partners. From this it is argued that the management of stakeholders is a supportive activity in the CPO.

Table 8-1 Part of the findings from performed sub-studies

| Part II (Chapter 4 and 5) | Part III (Chapter 6 and 7) | |
Possible conflicting success criteria (unique for public view point)	Key relationships	Key influences
- Satisfies needs of shareholders - Satisfies needs of stakeholders - Specific political or social elements - Satisfies needs of users	- From private partner to owner-operators (asses-owners) - Relationship with people who assist the final decision makers - Perception of the actual contribution of actors differs	- Triangular relationships (separate responsibilities) - Multiple responsibilities in the parent - Lack of joint picture of the decision-making lines

Decision process management: Finally the decision process management is added to the supportive activities in the CPO based on the results of the social network analysis and the cross case analysis (Chapter 6 and Chapter 7). The purpose of the majority of the contacts with the public parent and with other public organizations was decision making. The complex decision making in the public parent organization needs a carefully designed process. De Bruijn *et al.* (2010) point out that in a network hierarchical management stands little change. They state that the opposite of *command and control* is a process approach of *commit and direct.* To reach decisions a process of consultation and negotiation with other parties is needed. The results in the Q-sorts indicate that the acceptance of the project results (product success) is important - the criteria that indicate the satisfaction of (specific groups of) stakeholders are important indicators for public product success (Chapter 4 and 5). However, the lines with owner-operators and owner-clients are unclear (out of the cross case analysis, Chapter 6). These results are combined to address the importance of the processes towards product success. The ambiguous relationships, decision making in the public network and the long lines from private project organization to public parent bring up the need for a careful designed process of information flows leading to decisions. This justifies the appointment of the management of the decision-making process in the support activities of the CPO.

The purpose of the support activities is to enable efficient and effective primary activities. They support the controllability of the activities that create the project result.

The purpose of activities at three levels

In an organization different organizational levels can be recognized (Chapter 3). In the combined project organization the tactical and the operational level can be recognized. The purpose of the internal operations on the tactical level is to organize the assignment and to manage execution of activities by the operational core. The actual work is done by the work floor, at the operational level, where production activities are undertaken. As the project organization is still seen a part of the parent organization, the strategic level in project organizations is formed by a representative or number of representatives of the strategic level of the parent organization.

The effect of the characteristic *finite life* of a project is that the timeline seems less far than it sometimes is and the assignment of the project manager seems a pure operational one: deliver the project. Forming the combined project organization modeled like a permanent production organization this feature is examined closer. The existence of a permanent organization is endless. These organizations form a strategic level that navigates the firms' activities in the constantly changing society (Mintzberg, 1980). The finite but still considerable long timeline of the CPO legitimizes a strategic level within the project organization to 'navigate' the project into society. This strategic level must not be confused with the board or senior manager who supervises the proper implementation of the scope of the CPO. The current involvement of a senior level from the parent organization functions in terms of *assist, monitor* and *support.* The strategic level introduced here, is primarily part of the CPO and its task is to represent the interests of the CPO in the parent organization. Changes within the parent organizations that cause conflicts with the current scope of the CPO are to be addressed at this level.

The organizational levels in the CPO are supplemented with navigate as mentioned above. When the primary and support activities in the CPO are combined with processes for internal operations (produce, organize and navigate), the purpose per activity can be determined. The purpose per activity can be formulated in terms of the project success criteria (Table 8-2).

Table 8-2 The purpose of processes in two tracks

Operational mechanisms	Primary activities: create *purpose: add value*	Support activities: control *purpose: within given constrains*	Result *success criteria*
Produce	Execute primary activities	Execute support activities	Product success (fit for purpose, value added)
Organize	Organize primary activities	Organize support activities	Project management success (within given constrains)
Navigate	Navigate the project trough contextual changes (adapt)	Navigate project along contextual changes (organize stability)	Stakeholders success (predictable and connected)

The Value Chain for the public private partners

The activities of the public Value Chain represent all activities of the combined project organization. The collaboration between the public and the private project organization ultimately yields the entire Value Chain. Primary and support activities are executed by public or private employees. They have to be performed for a commonly recognized purpose and lead to an agreed result. In the analysis of relationships it was shown that activities and their purpose got separated (Chapter 7), causing inefficiency. By positioning the partners together in the chain of activities towards the project result, this can be avoided. By doing so, the external interface between partners is changing into an internal interface within the CPO (Figure 8-3). (De Bruijn and Ten Heuvelhof, 2010)

Figure 8-3 Public private interface becomes an internal interface
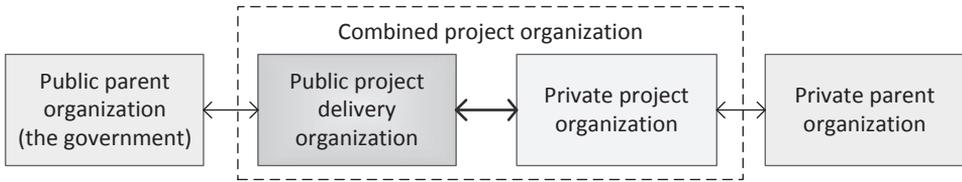
8.2.2 Chain of actions over the interfaces

When the combined project organization is positioned outside the parent organizations, internal interfaces change into external interfaces. In analyzing the external relationships (Chapter 6 and 7) three roles of the public parent organization were distinguished: the client-owner, the future owner and operator, and the licensing authority. For decision making, or to inform the parent organization in each role, activities in the CPO reach over the interface into the parent organizations. The activities that lead to the client-owner are firstly meant to show the client-owner that the CPO is in control and will deliver the project within given constraints. This information comes from the support activities, mostly from project management and contract management activities. Besides these activities there are activities that stem from the primary activities in the project and these are meant to show the client-owner that the project is fit for purpose. The client-owner will deliver the project to the owner-operator. Often different assets are delivered to several asset owner(s). In the network analysis (Chapter 6 and Chapter 7) actor-project relationships were directly related to the operator-owner. The purpose of these relations was to validate the developed solutions.

The public parent is also the licensing authority. The activities that connect the CPO with this role of the public parent organization are mostly prescribed to prove that the developed solutions are according to legal requirements. Hence, processes that connect the CPO with the parent organization must be separated in two different tracks (Figure 8-4). One to the licensing authority proving that the project outcome is legitimate and one to the client-owner presenting a fit for purpose result, within given constraints (Table 8-3).

Figure 8-4 Interface public parent organization – public project delivery organization
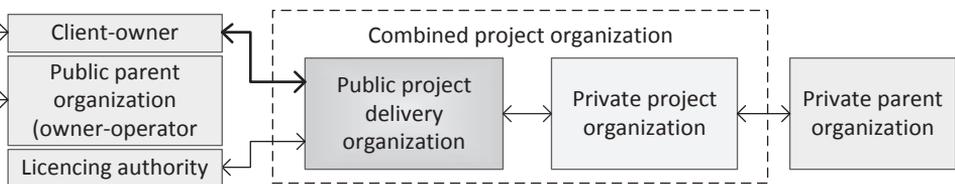
Roles of public parent	Primary activities	Support activities
Client-owner and Owner-operator	Fit for purpose	Within time and budget
Licensing authority	According to requirements	Right process followed
	product success	*project management success*

The private project organization is connected to the public project delivery organization on the one side, and its own parent organization on the other (Figure 8-5). The activities perfomed in the combined project organization are also connected to the private parent organization, which is a commercial, project-based organization. The execution of the project is their link with the private parent organisation. As the delivered assets will finally be owned by the public organization, this relation with the project organisation ends with delivering the project.

On the other interface the private project organization is connected to the public project delivery organization. The primary activities in the CPO are partly activities of the private project organization. These activities link to, contribute to and even partially take over, the activities in the public project delivery organization. However the activities in the private project organization should never bypass the public project delivery organization. The merged activities together form the information needed in the processes that reach into the public parent organization. In the same line, it is argued that the support activities merge to one line of reasoning towards the public parent organization, though to a lesser extent.

Figure 8-5 Interface private project organization – private parent
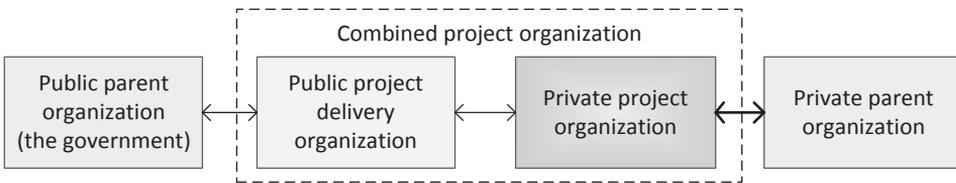
8.2.3 Summary

In this section the findings from the performed sub-studies are combined. The Value Chain of the CPO, a temporary organization that is responsible for delivering the project, is developed. The Value Chain of the CPO is modeled following Porter (Porter and Millar, 1985). The primary activities in the CPO are set up to create the product. These are legalize, prepare, design and engineer, construct and hand-over. The support activities ensure that the CPO is in control.

The support activities of Porter are transformed to fit the CPO. To prevent inefficiency and expanding debate leading to delay, knowledge management is introduced in the CPO. Also stakeholder management and the management of the decision making processes from the CPO into the parent organizations are added to ensure efficiency and effectiveness of the activities. The terms create and control are introduced to put more emphasis on the 'why' of processes within the CPO, which helps to identify waste and missing or weak links.

The public Value Chain contains all activities performed by the combined project organization. No distinction is made between private or public activities, hence public and private activities together must range over the complete public Value Chain. The activities that are performed are either part of the primary activities that create the project result, or the support activities that enable control of the primary activities. All activities extent beyond the CPO to the parent organizations. The interaction with the parent organization can be on production (operational) level, managerial (tactical) level or navigation (strategic) level. The term navigate is introduced to put more emphasis on the need to keep the CPO on track during its perennial but finite existence. From the activities, their purpose and the organizational level they are performed on, the specific actions on the interface with the parent organization can be derived (Table 8-4 and Table 8-5).

Table 8-4 Activities in the CPO and processes that link the activities to the public parent organization

Value Chain process	Purpose	Level	Processes on the interface with	
Primary process CPO			Client-owner	Licensing authority
Licensing				
Prepare	create:	Operational	Harmonize trade-offs	Validating the results
Design and engineering*		Tactical	Prioritize goals, align decisions	Explore possibilities
Build		Strategic	Ensure accountability (justify results)	Knowing the regulations
Turn-over				
Support activities CPO				
Project management**	control:	Operational	Delivery on baseline	(Interim) approving products
Contract management				
Knowledge & HR management		Tactical	Efficient use of resources, align processes	Ensure legitimacy
Stakeholder management		Strategic	Keeping goals aligned	Check feasibility
Decision process management				

*   including verification and validation

** including scope management, risk management, planning management, quality management, information management, financial management

Value Chain process	Purpose	Level	Processes on the interface with
Primary process CPO			Private parent
Licensing			
Prepare		Operational	Providing resources (people, materials, machines)
Design and engineering*	create:	Tactical	Alignment on needed resources, incl. knowledge
Build		Strategic	Introducing knowledge
Turn-over			
Support activities CPO			
Project management**			
Contract management		Operational	Justify expenditures and gain
Knowledge & HR management	control:	Tactical	Informing on risks
Stakeholder management		Strategic	Keeping goals aligned
Decision process management			

* including verification and validation

** including scope management, risk management, planning management, quality management, information management, financial management

To validate this proposed approach for the CPO, the public Value Chain and the corresponding activities, they are presented to an expert panel. The specific actions as presented in the tables above are used in the questionnaires for the validation process.

8.3 Validation process

8.3.1 General process

Thus far, explorative interviews, semi-structured interviews and case studies were performed to develop the insights in the purposes of the actions and processes undertaken by project management in public construction organizations. In contrast to the data collection in the sub-studies, this final part focuses on a more general view on projects from different viewpoints within and outside the CPO to ensure the reliability, credibility and applicability of the results (Creswell, 2013; Saunders *et al.,* 2011). Expert consensual validation from others is an acceptable strategy for producing trustworthy and believable findings (Brink, 1993). This means that the representativeness of the outcomes is checked by others familiar to the topic under study. In this research the reflections from four viewpoints are relevant: the public parent organization, the public delivery organization, the private project organization and the private parent organization.

The expert meetings were designed to collect the individual responses as well as to facilitate the discussion between the experts of four groups. First a panel was formed, consisting of experts from each viewpoint. These experts were sent an online questionnaire to be completed before the expert meeting took place (Appendix IX). Their answers were used to prepare the actual expert meeting. The meeting was designed to enable discussions about the activities on the interfaces between the groups. Based on the discussions, a few changes were made to the recommendations. After the expert meeting, the experts were asked to reflect on the adjusted recommendations by means of an online questionnaire, leading to the final results. This section describes all parts in more detail. Section 8.4 focusses on the substantive responses of the experts and the discussions.

8.3.2 The expert panel

Experts from the professional network of public and private participants in infrastructure projects (Neerlandsdiep) and our personal network were approached. For a broad representation experts from national, regional and local governments and private companies operating at regional, national and international level were included. The aim was to have at least one representative from each level in each viewpoint, preferably two, in which case the panel would consist of six representatives per viewpoint. In batches, 70 experts were approached. To ensure a general discussion, ongoing project relations and direct organizational relations were avoided. Of the approached experts 46 reacted. Some positive reactions ended up facing practical agenda problems to participate, so finally the meeting was attended by 21 participants: 5 representatives of the client-owner, 5 public project managers, 7 private project managers and 4 directors of contracting companies (Figure 8-6).

Figure 8-6 Interfaces discusses per the meeting

| 5 representatives of the public parent organization | meeting 1 | 5 public project managers | meeting 2 | 7 private project managers | meeting 3 | 4 directors of contracting companies |
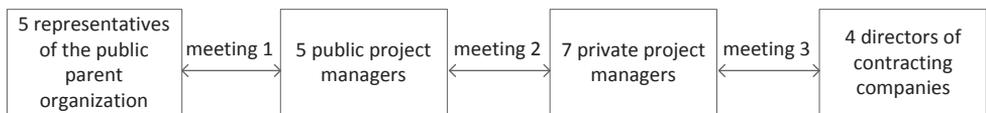
The representation of the private parent organization was minimal, with four participants. These four experts though are very experienced (over 15 years each) and three experts represent a contracting firm in the top 10 of contracting firms in The Netherlands, collectively accounting for 25% of revenues of the companies in the top 10 (Cobouw, 7 June 2016). The reflection on the models can count on the feedback of seven private project managers, so the private viewpoint is represented by a total of eleven participants. These experts are employed by ten different contracting companies, six companies are in the top 10 of contracting companies in The Netherlands, representing 88% of the revenues in 2015.

The client-owner point of view on national level was represented by two experts, one working on highway infrastructure and one working on waterway infrastructure. The other client-owner experts were employed by municipalities, of which one is working in a large urban area: a city with more than half a million inhabitants, in an area of ca. 320 km2. The public project managers were managing national highway projects (2), regional water projects (1), regional development projects (1) and national railway projects (1). The public part of the expert panel is formed by ten experts, from eight different governmental organizations, acting at different levels, in different areas of infrastructure. The majority of the experts in the panel (65%) has over 15 years working experience and another 17% 10-15years. Most experts (83%) are technically educated, 56% studied civil engineering (26% MSc., 30% BSc.).

8.3.3 The questionnaire

The final panel members received an email, in which they were asked to fill in an online questionnaire before coming to the expert meeting. The questionnaire was made in Collector (2013. Q3.SP1). Participants were sent an unique link by email. The questionnaire consisted of 21 questions, grouped into four main sections: (I) seven questions about the features of the CPO, (II) eight questions about the activities in the CPO, (III) three questions about the interaction on the interfaces and finally (IV) three questions for background information on the participant.

In the second part of the questionnaire Porter's Value Chain was presented, followed by a number of activities. Participants were asked to label the activities as primary or supporting activity or no project activity at all. This was done for the public part of the CPO and separately for the private part of the CPO. The presented activities are derived from the developed Value Chain of the CPO (Table 8-4 and Table 8-5). In the third part of the questionnaire a list of processes was shown and participants were asked to point out the activities that took place on a specific interface between organizational parts (5-point Likert scale). The complete questionnaire can be found in Appendix IX.

In total 23 questionnaires were completed of the 26 that were sent. At the meeting 5 experts did not show up in the meeting after all, coincidentally one expert from each point of view (2 public PM). A total of 21 experts were present at the expert-meetings. The results of the initial questionnaire include the responses of three experts who did not attend the meeting (one representative of the public parent organization, one public project manager and one public project manager). Three experts who received the questionnaire, did not complete the questionnaire of which two did not attend the meeting after all.

8.3.4 Structure of the expert meeting

The topics to discuss and validate with the experts are not on specifics of their separate roles, but especially on the interaction between the identified viewpoints, on the interfaces of the CPO. This was taken into account in the design of the expert meeting, resulting in three consecutive meetings in which a discussion between the viewpoints was facilitated. In the first meeting representatives of the client-owner and of the public project organization were positioned opposite to each other. After this discussion (one hour), the client-owners left the meeting and the private project managers entered the meeting. In this setting the discussion went on between public and private sector representatives, who together form the CPO. Finally, the public project managers were dismissed and representatives of the private organizations entered. The discussion continued between private project and private parent organization (Figure 8-6).

The structure of each sub-meeting was the same. After a short introduction of the complete research the concept of the CPO and the Value Chain were presented. The specific outcomes from the questionnaire were presented and discussed by the experts. Next the recommendations were presented. As these are pointing at specific processes in the Value Chain and the interfaces of the CPO, the reflection on the recommendations was a wrap up of the discussion held in the first part of the meeting. Per meeting the recommendations on the specific interface(s) were shown.

During the meeting the experts could influence each other. To minimize the dominance of specific persons, the experts were asked for individual feedback. At the end of each meeting the final questionnaire was announced. This final questionnaire was sent to the experts who attended the meeting. In this questionnaire, the final recommendations were presented and the experts were asked to agree or disagree, eventually supported by additional remarks.

8.3.5 Preparing the discussion

The expert-meetings were prepared by analyzing the answers from the initial questionnaires. The differences in the answers per sub-group were highlighted and presented in the specific meetings. Based on the answers in the first part of the questionnaire, the positioning of the CPO between project and production organization was confirmed. The activities in the CPO were appointed to be either for a large part routine (50-80%), lasting 2-5 years, or the activities are less-routine (ca. 40%), lasting over 5 years. According to 55% the experts most people are involved in the CPO for several years. According to the respondents the CPO has to be flexible and adaptive, but also stable and predictable (Figure 8-7). As the experts agreed that the characteristics of the CPO are positioned between the project and the project organization, it is concluded that the basis for a comparison with Porter's Value Chain is present.

Figure 8-7 Characteristic of the CPO, according to the respondents

legend: ■ not necessary ■ somewhat appropriate □ required ■ to a large extent necessary ■ necessary
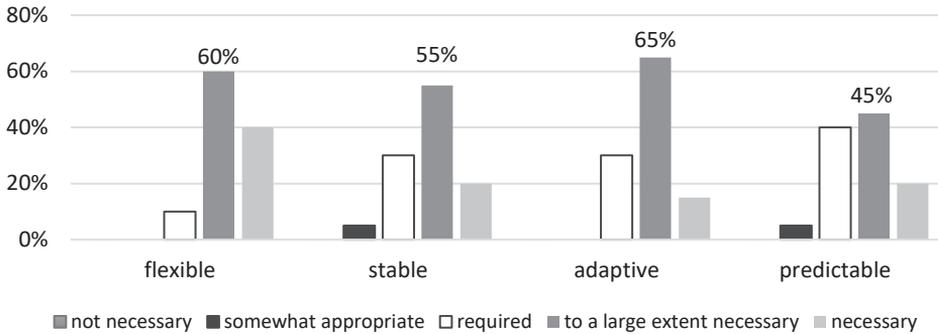
In the second part of the initial questionnaire the activities of the Value Chain were presented. Respondents were asked to position these as primary or supporting activity: once for the public project delivery organization and once for the private project organization. The disagreements per viewpoint were used as starting point for a discussion in the meetings.

Meeting 1: the interface between public parent and public project delivery organization

This meeting was between public client-owners and public project managers. From the initial questionnaires, the following discussion themes were identified: *legalize, prepare, contract management and stakeholder management.* The individual answers in the questionnaire on the position of these activities did not correspond. In addition, there were differences of insight into the responsibility for these activities: either public or private. To start, the activities *legalize* and *prepare* had to be discussed. The answers of the respondents were evenly distributed between primary and support activities of both public project delivery organization as well as private project organizations (Figure 8-8a, legalize and Figure 8-8b, prepare). In the public Value Chain these activities are primary activities. In this meeting also the insights in the position of the support activities *contract management and stakeholder management* were subject of the discussion as the majority of the public respondents (>80%) labeled this a primary activity, which is not in line with the developed Value Chain. The public experts also indicated *verification and validation* as core contribution of the public partner, which is in the Value Chain part of the primary activities. The answers in the questionnaire indicated that the public experts consider core activities of the public part of the CPO: *organizing decisions, contract management and scope management.* These activities were positioned as support activities in the context of the CPO. In general, based on the analysis of the answers it is concluded that the role of the public part of the CPO is largely supporting the Value Chain, as the public respondents label the support activities their primary activities.

Figure 8-8a / b Ownership of activities according to the experts in meeting 1
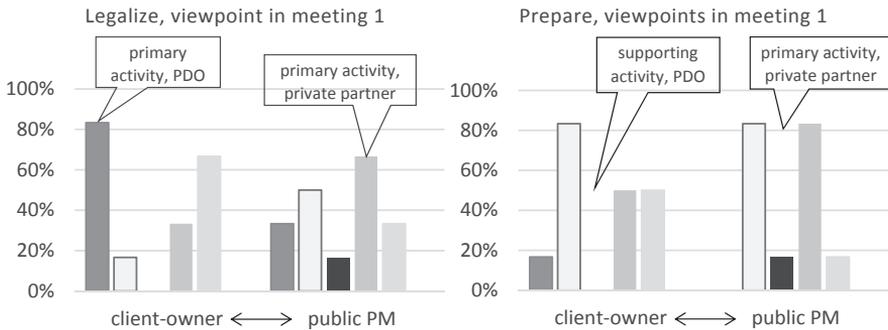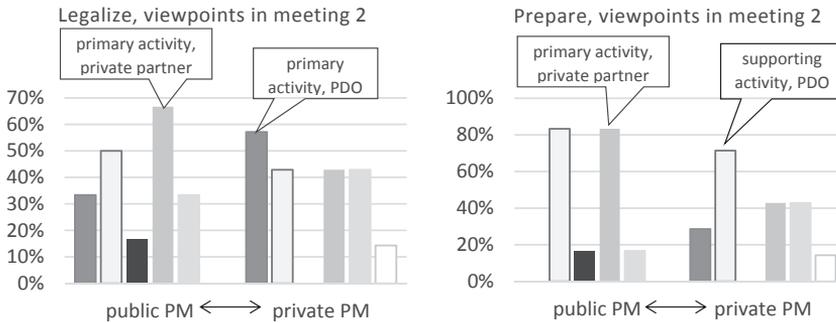

Meeting 2: the interface between public project delivery organization and private project organization

In the second meeting five public and seven private project managers were present. Based on the initial questionnaire results, the following themes were identified for discussion: *legalize, prepare, verification and validation and stakeholder management. Legalize* and *prepare* had to be discussed, as the answers on these issues showed a lack of consensus on the ownership between public and private partners and the position of these activities in the Value Chain (Figure 8-9a and Figure 8-9b). Also the *verification and validation* of the design, engineering and building products was prepared for the discussion. According to the principles of Systems Engineering, these activities are part of the primary activities. The responses in the questionnaire showed that partners think differently about this subject. Five out of six public project managers indicated *verification and validation* as a primary activity for both public ànd private partner. The private project managers think differently. Three out of seven labeled the *verification and validation* supporting for public and private partner, one private PM labeled it primary for the public partner and four private PM labeled it primary for the private part of the CPO. Hence, enough differentiation to discuss this subject in the expert meeting. Based on the initial questionnaire, a

similar differentiation was identified for the subject *stakeholder management.* The majority of the project managers indicated this as a primary activity for the public project organization. In the Value Chain of the CPO this was indicated as a supporting activity. In addition half of the project managers (both public and private) indicated *stakeholder management* a primary activity for the private part of the project organization and half of them a supporting activity.

Figure 8-9a/b Ownership of activities according to the expert in meeting 2

Meeting 3: the interface between private parent and private project organization

In the third meeting the private project managers were confronted with the directors of private contracting companies. Based on the initial questionnaires the following themes were identified for discussion: *legalize, prepare, design, verification and validation and decision making.* Again the activities legalize and prepare were prepared for the discussion (Figure 8-10a legalize and Figure 8-10b prepare) as respondents labeled these issues differently in ownership as well as in the position in the Value Chain.

Figure 8-10a/b Ownership of activities according to the experts in meeting 3
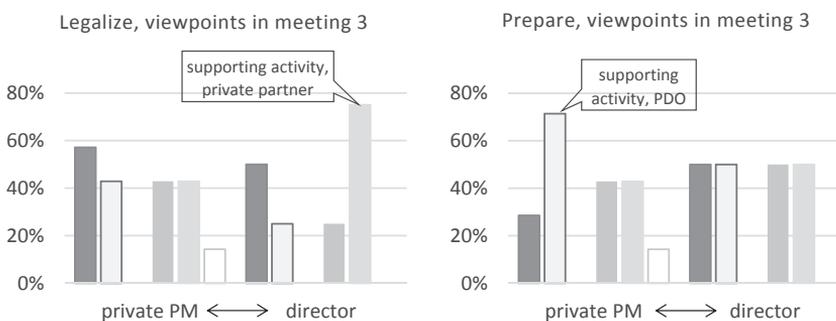
Based on the answers of the private respondents the activity design was discussed. From the viewpoint of the private respondents this activity is a primary activity for the public project delivery organization. However, formally the responsibility allocation for this activity depends on the chosen contractual form. So, it can be either the public or the private partner who is responsible. This was shown to the participants in the third meeting and discussed (Figure 8-11).

Figure 8-11 Ownership of design according to the experts
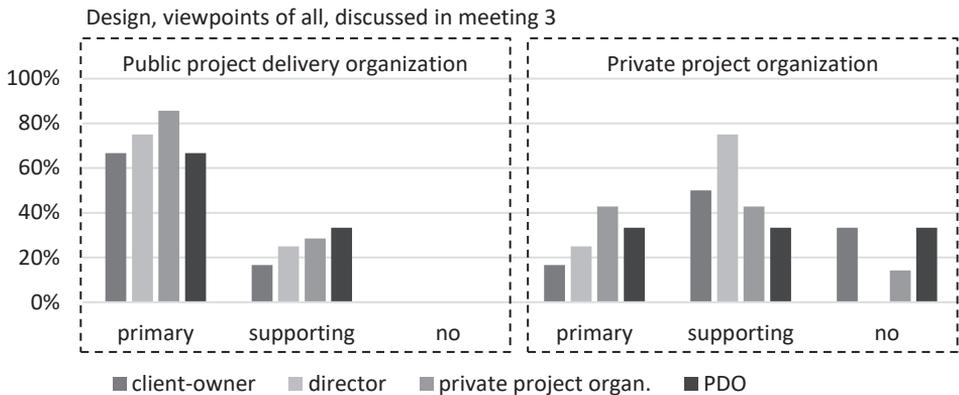
The issue of *verification and validation* was also addressed for this meeting. The positioning of this issue towards the public partner was quite similar for the private project managers and the directors. However, it was very different for their public partners. Where the public partners value verification and validation as a primary activity of their own project organization, only two out of eleven private respondents agreed. Four private respondents even labeled this no public activity at al. Though the public partner was not present in meeting 3, the question to ask in this meeting was how this emerges in the collaboration in the project. The final issue prepared for the third meeting is *decision making.* Three out of four directors addresses this a support activity for the public partner in the CPO. The other public and private experts thought differently as they labeled decision making a primary activity for the public project delivery organization. The question to discuss in the third meeting was whether the directors recognized the central role of the decision making process in the CPO and the difficulties that might emerge from this in the collaboration between partners (Chapter 6 and 7).

8.3.6 Final individual feedback by second online questionnaire

At the end of each meeting the second questionnaire was announced. This final questionnaire was only sent to the experts who attended the meeting. Based on the discussions in the three subsequent meetings, a few changes were made to the Value Chain and the recommendations that accompany the Value Chain. The questionnaire that was send afterwards consisted

of nine recommendations to which individuals were asked to agree or disagree, supported by the open request for additional remarks. With this last questionnaire it was ensured that the experts responded to all recommendations and it neutralized any potential domination of individuals during any of the meetings. Of the 21 participants, eleven completed the final questionnaire (52%). The majority of the respondents presented the private side (73%): Five private project managers and three directors of construction companies finished the final questionnaire. The public response was lower; one client-owner finished the questionnaire (three started) and two public project managers. They represent 27% of the public participants in the expert-meetings.

In general, the respondents agreed with the presented recommendations after the expert-meeting (Figure 8-12). Recommendation 3, 4 and 8 were fully agreed on. The other recommendations were agreed on by the majority of the respondents. Recommendation 6 was least agreed but still by 73% of the experts.

Figure 8-12 Response on the recommendations presented after the expert-meeting
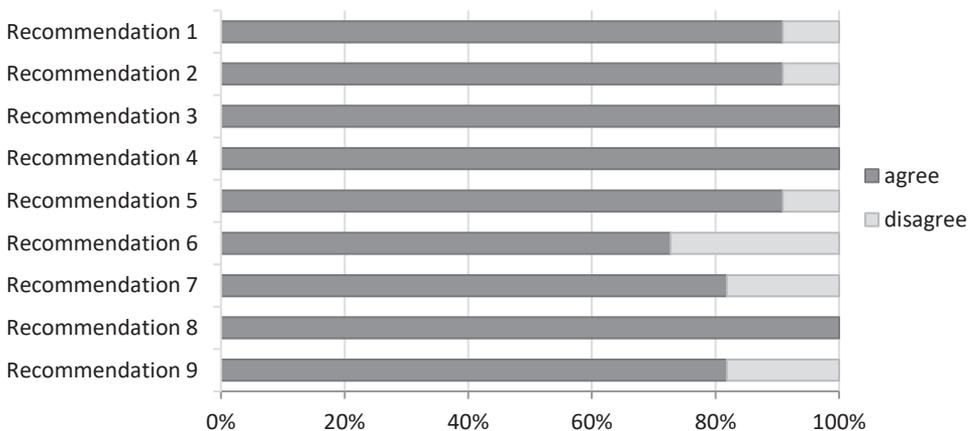
8.4 The experts' response to the Value Chain model

This section focuses on the substantive response of the experts. During the expert-meetings the Value Chain model was presented together with specific outcomes of the initial questionnaire that pointed to differences in opinion on the position of primary and support activities and recommendations pointing at specific activities in the Value Chain. The discussions conducted in the expert-meetings led to some changes to the public Value Chain and supporting recommendations.

8.4.1 The public Value Chain for infrastructure projects

The first presented recommendation was formulated *When starting an infrastructure project, aim for an organization not just a team.* The discussion in each meeting started with clarifying questions. The public experts in meeting 1 mentioned that they already organize a project team before contracting a private partner. During this discussion one of the public project managers emphasized that in the pre-contract phase usually too little account is taken in the navigation of the project after tender. Several public project managers pointed to the dependence of the contractual arrangements and the division of responsibilities and tasks between public and private. They did not pay attention to the fact that the dividing line is set by them (not by the private partner). In the second meeting the private participants indicated that the distribution of tasks and responsibilities for these activities should be a discussion between partners in the CPO. The introduced models were considered helpful in the discussion about the purpose of activities and the most efficient division between public and private partner. Therefore, the recommendation is reformulated as follows (rec_1):

After contracting, jointly organize the combined project organization for efficient and effective production. Hereby give explicit attention to the design of the Value Chain, especially to:
- **the interaction and coherence in public and private activities and processes towards the same goal (and make it explicit);**
- **the differences in the contributions and responsibilities in the processes from public and private part of the project organization;**
- **aligned, unambiguous action in the project area (network approach), each in his own strength. And;**
- **the formation of a shared view on decision-making processes, from project organization into the parent organization.**

The reflections lead to some changes in the presented Value Chain for the CPO as shown in Table 8-6. In the three meetings and the final questionnaire experts agreed on the Value Chain of the combined project organization as the joint domain of the project partners. In all meetings, it was expressed that this shared domain must be of mutual interest and lead to the most satisfied stakeholders. The right distribution of tasks, responsibility and risks has to be discussed to maximize the potential benefit of the model. This was clearly expressed in the second meeting (public and private project manager). A private project manager compared the mindset of the CPO with his experience in an Alliance: *"Particularly in the team, the joint setup of activities was considered a success. There we created an imaginary fence around the joint organization. At some point the parent organizations experienced it (too) challenging. But it is in the people who take the experience with them to other projects and apply it again. Unfortu-*

nately it does not spread out so much yet." The common interest is in satisfying the stakeholders of both public project partner as well as private project partner (meeting 2 and 3).

Both the adaptive capacity of the CPO and the quality of the project outcome are important to organize in the joint domain. The first aspect was expressed in meeting 1 (public experts), the second aspect mostly in meeting 2 and 3. In meeting 3 it was expressed that after tendering contractual arrangements form restrictive barriers for a constructive discussion about the distribution of responsibilities. The private experts indicate that contractual frameworks to facilitate capturing the outcomes of the discussion have to be developed, accompanied by flexible and adaptive payment arrangements. The private experts in meeting 3 agreed that this can optimize the efficiency of the CPO.

Table 8-6 Value Chain of a combined project organization

Value Chain process	Purpose	Division of tasks and responsibilities
Primary process CPO		
Licensing		Public lead, private contribution (formulation in the contract)
Prepare		Public lead, private contribution (formulation in the contract)
Design and engineering*	create:	Formulation in the contract, task always include verification
Build		Private lead, always includes verification
Turn-over		Public lead in process to client-owner and owner-operator(s)
Support activities CPO		
Project management		Public control on general processes, with private contribution included. Contractual management as part of general management, as well as scope management to be adaptive to environmental changes
Decision process management	control:	With regard to project partners and asset-owners. Public lead, private contribution
Stakeholder management		Public lead, private contribution, always include validation
Knowledge and HRM*		Common subject, transparency needed for optimal effectiveness

* discussed at recommendation 2

During the three meetings various elements of the Value Chain were discussed. Experts agreed on the following remarks accompanying the activities:

1. Contracting is not part of the combined project organization. Contracting is important for the public part of the project organization to select a private partner. After tender this process should be downgraded. A public project manager mentioned in meeting 1: *"It is a supporting task which is made primary in current practice of the public part of the project organization."* None of the participants mentions the selection of subcontractors as an activity for the CPO.

2. Preparation and legalization are primary processes of the Value Chain. However nowadays they are hardly combined activities. The processes aiming for licenses are frustrating for both partners. Experts mention a continuous discussion on the responsibilities of the partner on this subject.

3. Preparation includes several topics. Some of them, like land purchase, are legal responsibilities of the public organization. Interestingly, in all meetings the role of the parent organization is recognized as possibility to achieve efficiency. Long-term agreements with stakeholders (owners of assets that are influenced by the project) can be made at the strategic or tactical level in the parent organization. A client-owner in meeting 1 noticed that at program level a start was already made, first results were very positive.

4. Important improvement mentioned is joint validation as part of (joint) stakeholder management. Stakeholder management is a key task for the public part of the CPO, because the parent organization (the government) remains accountable for stakeholders after completion of the project. The private partner supports the public part with specific (operational) activities.

5. Public and private project managers recognize the importance of active involvement in the decision making process (expressed in meeting 2). In current practice this can be optimized.

In the second online questionnaire, that was sent after the meeting, the experts were asked if the final model of the Value Chain with primary and support activities contribute to the improvement of the performance of the CPO. In other words, they were asked if this model will increase the probability of project success: ten out of 11 agreed. Expert_11 (private project manager) comments on this recommendation: *"With this Value Chain the focus of the project organization is more clearly on achieving the project goal. The management of the interface with the parent organization is more focused on whether or not the interests of the individual asset-owners are guaranteed".* And expert_12 (public project manager): *"In particular, the handover is the least well integrated phase in the production process. The positioning of the stakeholder management as supporting activity for both partners, will increase the involvement of asset-owners during the execution. In my view, this will increase the social benefits of the project".* The expert that did not agree (expert_13, a private director) remarked that the role of the private partner in the support activities was still too small in his opinion. All remarks accompanying this recommendation in the final questionnaire point that way. For instance expert_3 (public project manager) comments on this recommendation: *"The private partner can help us to control the scope, while they also benefit, maybe even more than the public partner."* The public respondents of the final questionnaire noticed that the stakeholder management activities are related to scope management and preferably both are common activities. The position

of these activities as support activities in the CPO puts more emphasis on the importance during all primary activities, up to the handover.

Common interest of all involved viewpoints: the development of people

The second recommendation was pointing at specific activities in the Value Chain namely the management of knowledge and people in the combined project organization as supporting activity. Both public and private project managers indicated that the management of people and knowledge is a success factor in their projects and thereby (for that reason) already has their attention. On this subject the common interest for project and parent organization is insufficiently deployed as mutual interest. The experts in the three meetings acknowledged the value of a proactive interest from the parent in the development of people in the project. The representatives of (especially public) parent organizations in meeting 1 and meeting 3 recognized the active use of project roles in the development paths of staff from project to project. The development of (new) knowledge in the project depends on the scope of the project and the knowledge level of people in the project organization. Still pro-active interest from the parent organization in this subject is considered valuable. So the recommendation is especially important to the public and private parent organizations (rec_2):

Pay conscious attention to Human Resource and Knowledge Management in the project organization. Arrange a pro-active approach from the parent organization to the project organization for designing development programs for employees and monitoring of required and acquired knowledge.

In the final questionnaire ten out of eleven experts agree on this recommendation. The public project manager that does not agree, Expert_5, remarks that the personal development is mainly the responsibility of the employee himself. Expert_13 comments: *"This [recommendation, red.] creates an interesting dynamic and reciprocity in two directions. It also requires two sided proactivity. (…). If we actively manage this reciprocity and development and open up to it, professionalism of both public and private parent organizations and project organizations, will probably develop quicker and more direct than has hitherto been the case."*

8.4.2 Joint operation in the projects' environment

The third recommendation stems from the CPO model and the multiple decision lines to the public parent organization. The initial formulation of this recommendation is to make a clear distinction between the role of the parent organization as licensing authority and the role of the parent company as client-owner. The public experts reflected in meeting 1 (only public representatives) that there is no need to express the subject of this recommendation so explicitly.

In meeting 2, where public and private project managers interacted, a public project manager mentioned *"it is evident that you must act from the project towards permitting authorities, if needed. Everyone must take responsibility and act in the project interest."* In response to that, private project managers mentioned that they would like to use the knowledge and the network of their public partner in these processes for the benefit of project progress. However, the private project managers clearly expressed that they miss transparency and interaction with their public partner to understand the public network well enough for optimal use of relationships and influence to achieve project goals effectively and efficiently. Public project managers reacted surprised as the private project managers expressed the processes are very much unclear to them. The private project managers indicated that they at least want to understand the public decision-making, so that they can support their public partner more in this area, which contributes to more togetherness in the CPO.

In this discussion the difference between the client-owner and the owner-operator was expressed. The public parent organization is therefor in the final recommendations divided over three roles (Figure 8-13, mutation of Figure 8-4). The fourth recommendation was to *shape the role of client-owner from both the current role of asset-owner and the future role of asset-owner (or owner of future asset).* Though pointing at this third role, the formulation of the fourth recommendation was insufficiently reflecting the operator-role. The discussion in the expert meetings showed a clear division of the role of owner-client and owner-operator. The discussion was triggered by the process verification and validation in the Value Chain. Especially in meeting 2 the operators were indicated as very important stakeholders for the project, whose requirements need to be understood by everyone in the CPO. The handover process of the product (project result) runs from CPO to client-owner to owner-operator. The project closure process in terms of project management result (within time and budget) runs to the client-owner.

Figure 8-13 Interface public parent organization – public project delivery organization
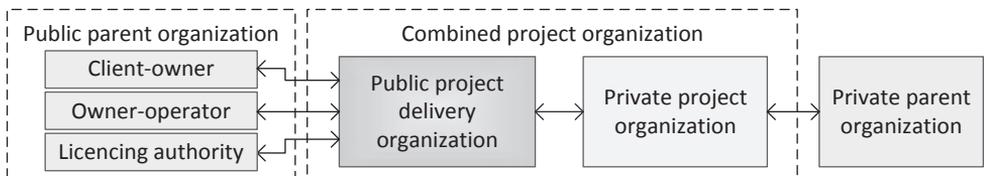
With this in mind the recommendations are reformulated, so they are recognized by project participants. Recommendation 3 which is especially important for the public delivery organization and public parent organization is reformulated with respect to the current situation and influence of the client-owner and public project manager (rec_3):

Be transparent about the public roles and organizational context of functions towards the private partner. Make a clear distinction in the roles played from the public parent organization (and public partner organizations), in particular about the role of the parent as licensing authority, the role of the parent as asset owner (owner-operator) and the role of the parent as a principal (client-owner).

In the feedback received in the final questionnaire all experts agreed on the fact that this recommendation contributes to more efficiency in the CPO. Several experts (expert_1, expert_5, expert_14) supplement this recommendation with a clear division of responsibilities, risks and understanding of where the influence of the public partner in de CPO ceases.

Recommendation 4 and 5 are especially important for the partners in the CPO. Following recommendation 1 in which the importance of setting the right scene is expressed, for handling the external stakeholders the recommendations are (rec_4 and rec_5):

Act jointly towards external stakeholders. Validate the contractual design jointly to make sure the CPO is producing the right result.

Right after contracting create the workflow towards asset-owners jointly, including decision-making by the accountable stakeholder. From the beginning ensure commitment from the stakeholder in this workflow.

These recommendations are supported by 100% and 91% agreement in the final questionnaire. Experts were asked to note eventual bottlenecks. Several experts (expert_1, expert_5, expert_11 en expert_13) pointed in recommendation 4 at the responsibility struggle between public and private partner. Accepting the contractual design implies at least shared responsibility. The private project managers pointed at the restrainment that they experience by their public partners. Expert_7, expert_9 and expert_14 pointed to the openness and trust that is necessary between partners as a bottleneck for achieving the desired situation. In recommendation 5 expert_10 pointed out that it takes a great deal of empathy of both partners to understand the considerations in the parent organization of the project partner. Expert_8 mentioned the differences in culture as a bottleneck. Expert_12 who is a public project manager acknowledged the correctness of the recommendation but mentioned the lack of knowledge by the owner-operator as a serious bottleneck for an effective fulfillment in the desired process.

Recommendation 6 stays formulated as presented in the expert-meetings (rec_6):

> **Put the public project organization at a clear distance from the licensing authority, so the public project partner can actively contribute in procedures without conflicts of interest.**

This recommendation is the least supported in the final questionnaire, 3 out of 11 disagree. Their reasons to disagree vary from *"this is already the case"* (Expert_1) to *"we do not need a licensing authority if we do our jobs right"* (Expert_12). An interesting remark is made by Expert_13 who stated that *"contact of the public partner with their licensing colleagues can also bring old conflicts back into the CPO."*

8.4.3 Transparency in the purpose of joint processes

From the performed research a few recommendations that consider the internal activities of the CPO were formulated, with special interest in the position of each partner in these activities. For the public project partner in the CPO, who has the lead in the project management activities, the recommendation is to (rec_7):

> **Make a clear distinction between project management success and product success. Provide balance between management of the primary – creating - and the support – controlling - activities. Communicate and report separately but simultaneously and equally on substantive technical process and risks, and procedural progress and risks.**

In combination with the presented Value Chain model the public project managers in expert meeting 1 agreed with this recommendation. They expressed that it improves the positioning of their (project) responsibilities towards their parent organization and the contribution of the project result to the parent organization. For optimal efficient and effective processes partners agreed on the fact that they should *share knowledge and information to support a joint approach to decision making for a more successful outcome.* In the final questionnaire 6 out of 11 experts mention that recommendation 7 is very theoretically formulated. The difference between project success and project management success is not widely known, which makes it harder to act in line with this recommendation. Expert_9 added an interesting remark. He commented: *"When procuring, the focus is (often), especially on the project management success (e.g. contract, planning, project plan). That probably sets a tone. An equal focus on either the product's success therefore requires a lot of attentio*n".

The recommendation to *take care of transparency toward the partner about progress and risks in the own contribution to processes in the Value Chain to support the CPO in the management of risks* is putting emphasis on the attitude of both partners. This recommendation cannot be considered without having the above line of reasoning in mind. This recommendation is to be considered for all primary and support activities with one partner in the lead and the other partner supplying information in the process. In the expert meetings specific interactions were put forward:

- The public parent organization mentioned the difference in impact of failure in stakeholder management for the involved organization (meeting 1). The assessment of risk in this area is different as well as the level of acceptance of risks.
- A private project manager mentioned the importance of a joint validation process with stakeholders at the start of the joint organization (meeting 2). To control risks by the right partner, both partners should have a joint understanding of the risk.
- Especially in the project activity legalize further horizontal integration of tasks is possible, as long as risks are allocated correctly. An expert from the private organization mentioned the absence of financial consequences of risk allocation in the discussion (meeting 3). The common opinion of the experts on this is that the correct risk allocation and transparency in the management of risks leads to the most effective collaboration in the CPO. Or, to put it the other way around, to enlarge the effectiveness of the CPO at the start the issue of risk allocation and management has to be an integral part of the organization of controlling the activities in the CPO.

Finally the navigation level is addressed in the recommendations. Considering the CPO (rec_8):

Both partners should appoint a representative Project pivot, visible and approachable for the partner.

Someone who has the respect of the decision making level in the parent organization, and without direct responsibilities in the parent that might interfere with the projects interest. This Project pivot builds and maintains a project relationship on strategic level, to be used for navigation rather than escalation. As one of the representatives of the private parent organization put it elegantly (meeting 3): *"The coffee tastes better in relation than in escalation".* Both public and private pivot should invest in involvement and comfort, and be able to explain and cover projects' actions in the parent organizations. This recommendation is fully supported in the final questionnaire. Experts indicated the proper interpretation of the role of Project pivot as a potential problem for a successful implementation of this recommendation.

8.4.4 Contribution to the efficiency by the public parent

The main research question points to the project structure to support enhancing project success. In the network analysis it was observed that some improvements are best addressed in the parent organization, rather than the project organization. This was discussed in expert-meeting 1. The observed improvement referred to the involvement of asset owners in the project; owners of assets that are affected by the project activities (without any improvement to the asset). As their assets are located in public area, the assets are affected by several projects at different locations. There is no common interest for these asset-owners in the objectives of the projects. Common interest can be found on another level: the network level and the client level. The clients of both the parent organization and the asset-owner organizations are individual civilians. Arrangements for combining activities at least decrease the impact of the projects for their shared clients, which can be a driver to discuss arrangements on network level. So instead of leaving arrangements with asset-owners of public networks to each CPO, providing alignment on the level of the parent organization ultimately benefits the civilians both financially and functionally. To put it more general (rec_9):

> **Organize on the level of the public parent organization a multiple project, multi-annual agenda with the owners of public assets.**

In the final questionnaires nine out of eleven experts agree with this recommendation. Expert_12 (public project manager) noted: *"Start with this tomorrow!"*. Several experts mention the actual organization of this mechanism as a challenge. The experts that do not agree fear less flexibility and influence for the CPO (expert_5 and expert_11).

8.5 Conclusion and discussion

In this chapter the public Value Chain and the activities on the interfaces are presented. To develop the Value Chain the insights from the explorative interviews, semi-structured interviews and case studies (Chapter 3 to Chapter 7) were used to build this model. To validate the outcome and the applicability of the model three consecutive expert meetings were organized, supported by a preliminary and final online questionnaire. The central question was *'to what extend can the public Value Chain approach be used to improve the efficiency and effectiveness of the public and private actions?'* The answers in the meeting and the final questionnaire support the applicability and usability of the model for people working in infrastructure and construction projects.

The expert meeting was attended by 21 people, four to seven experts per view point. The public contribution in the first questionnaire and the expert meetings was well-balanced as the participant groups consisted of 5 client-owners and 5 public project managers. These experts are employed by national, regional and local government, which is considered a strength in the reflections. Though the content of their response show no specific differences, the number of the representatives of each governmental level is limited. Only three public employees finished the final questionnaire. The response of the private experts in the final online questionnaire was 73% (8 experts out of the 11 that attended the meeting), which can be seen as a confirmation of the benefits the experts see in the model.

The value of the expert meeting is the fact that the models are recognized by the experts and their reflection on the applicability in daily practice. Recommendation 3, 4 and 8 are fully agreed on by the experts, the other recommendations are agreed by the majority of the respondents. Recommendation 6 was least agreed by the experts, still agreed by 73% of the experts. The specific elements in the models are supported by the outcomes of previous sub-studies, and, based on this final study, are supported by experts from public and private organizations. The feedback in the meetings have been influenced by arguments expressed during the discussion and a dominance of individuals. To collect the individual reactions on the elements of the model and the recommendations two online questionnaires were used. The combination of free expression of thoughts in the meetings and structured answers on closed and open questions in the questionnaires has provided us with a large variety of feedback on the results of this PhD research.

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Chapter 9 Closure

Abstract

Considering the research field infrastructural developments with governmental ownership, the main research question was *How can the governmental project structure be organized to support the cooperation between public and private partners towards enhanced project performance?* This PhD research concentrated on the management and organization of projects in the pre-construction and execution phase. It focused on the organizational levels where people of public and private organizations daily collaborate. After conducting a series of studies, the public Value Chain is drawn, accompanied by nine recommendations to enhance project performance. The public Value Chain will help collaborating partners to position their specific contribution more clearly. Specific recommendations for the public parent organization emphasize the subjects where common interest can be found at other levels than the project level. A multi-annual approach to align project activities with other asset owners is one of those subjects. The development of their employees in the project organization is another. Finally, the public parent organization can contribute to enhanced project success by placing the project organization at a distance. This provides the project organization room to balance the interests of all stakeholders and their specific interests. In this balance the project organization truly serves the public interest.

The scientific field is challenged to use this model in further research on losses within the Value Chain. Also research is recommended on contractual arrangements to support the discussion about the distribution of responsibilities, accompanied by flexible and adaptive payment arrangements. This will help the collaborating parties to define their role in the combined project organization, to distribute responsibilities more clearly and to position risks where they can actually be managed. Because everyone's contribution leads to the controlled creation of good project results, trust can grow between partners which will further optimize collaboration between public and private partners.

Practitioners are encouraged to use the public Value Chain to organize their project activities and discuss the contribution of the parent organization to an efficient process with both public as well as private parent organizations.

9.1 Introduction

In this chapter the conclusions of this PhD research to the improved performance of public infrastructure projects are presented. First, the validity and limitations of the research are discussed in Section 9.2. Subsequently, the answers to the defined sub-questions are given in Section 9.3. Followed by the answer to the main research question to conclude this research. The results can lead to debate between representatives of public and private (project) organizations and to new questions for on-going scientific interest in the management of infrastructure projects. The scientific contribution is discussed in Section 9.4. Recommendations for practitioners and further research are given in Section 9.5.

9.2 Validity, limitations and discussion

9.2.1 Validity of the research

This research applied a mixed method approach (Creswell, 2013; Tashakkori and Teddlie, 1998). Both qualitative as well as quantitative methods are applied. Q methodology, used to identify the public success criteria, combines qualitative and quantitative aspects, field and desk research, interaction and reflection (Van Exel and De Graaf, 2005). In Chapter 4 and 5 the quantitative measurement of the success criteria, was followed by a qualitative interpretation. This interpretation was done contextually with the help of the information from the interviews. The same setup can be recognized in the social network analysis as presented in Chapter 6 and 7. In this sub-study the initial data led to a quantitative representation of the network of the project organization. This quantitative representation was followed by a qualitative analysis, again using the context information provided by the respondents. Though the initial and final questionnaire that were used in Chapter 8 for the expert-meetings contained quantitative elements, the final evaluation of the public Value Chain was mostly qualitative as the expert-meeting was the core activity.

To assess the validity of the total research design, the concepts of internal validity and external validity, construct validity and reliability are addressed (Creswell, 2013; Saunders et al., 2011; Tashakkori and Teddlie, 1998; Yin, 2013). Internal validity refers to the question whether the causal relationships found, are indeed caused by the factors studied. This question is of lesser concern in the sub-studies where Q-methodology was used (Chapter 4 and 5) and in the network analysis (Chapter 7). Q-methodology has an exploratory character, the network analysis was descriptive. In the cross-case analysis in Chapter 6 the internal validity has to be approached with sufficient care. Therefore the findings are carefully addressed to as assertions. The assertions contributed to the final results, which were validated in the expert meetings.

Construct validity refers to whether in the sub-studies was measured what was meant to be measured. In all interviews, this has been taken into account by asking the respondents to complement the information in general sense (What did you miss in this interview? Do you wish to add something?) and allowing them to approve the interview reports. Very little research on the construct validity of measures of network concepts has been conducted (Wasserman and Faust, 1994). In the survey that concluded the expert-meeting the construct validity was controlled by providing each recommendation with a free format for additional information.

External validity refers to the extent to which the findings are generalizable. The results in this PhD research are based on input of 106 unique respondents, divided as follows: four exploratory interviews, 54 Q-sorts (26 Dutch and 28 Western European), 27 interviews in three cases and 21 experts who attended the expert-meetings. All respondents are employed in the infrastructure industry, hence the findings are specifically valid for projects with an infrastructure scope. The expert meeting in which various experts from different organizational viewpoints were involved contributed to the external validity of this research. In order to limit the impact of group pressure in this session, online questionnaires have been used to obtain individual responses. By testing the developed approach to organizing infrastructure projects this way, it is believed that sufficient attention is paid to the external validity of the outcomes.

The concept of reliability is about whether the study, when repeated, would lead to the same results. This is ensured by developing interview protocols with for an important part closed questions (Q-sort, case study interview protocol). In line with their exploratory nature the first four interviews had a more open character. All interviews have been recorded and transcribed. The transcriptions of all interviews were approved by the respondents before processing the results into the analysis software. This input has been carefully documented. Because there is no external criterion for a person's point of view, the issue of validity of Q-sorts does not apply (Brown, 1980). Q-sort generates reliable outcomes, as the respondent can oversee their opinion after finishing their Q-sort and can make changes if the whole does not reflect their preference regarding the subject of study (Van Exel and De Graaf, 2005). The reliability of the input of the experts in the expert meeting is secured by the questionnaire per individual expert, before and after the expert-meeting.

As indicated at the start of this research a pragmatic research approach was followed, meaning that each research question was viewed on its own, for the most fitting approach. The aim of this approach was to provide convincing results, as factual as possible based on an exploration of existing structures (functional paradigm). The sub-study that used Q-methodology had an exploratory character. It revealed key criteria regarding what kind of success the public project managers strive for in their projects.

At the project configuration level, an appropriate research methodology is social network analysis focusing on either inter-organizational or inter-personal level relations. At the inter-organizational level (Winch, 2014), the Social Network Analysis of the cases revealed how the parent organization in its multiple roles together with other owner-operators, influences the efficiency and effectiveness of the combined project organization. As the atmosphere within a network is dynamic and constantly changing, case studies provide a means of both confirming and refuting the conditions under which theories are applicable (Batt, 2012). Valid research should raise the level of awareness of the participants about the knowledge produced by the research and should encourage action (Batt, 2012). The expert meeting confirmed the overall pragmatic research approach as a fitting approach since the provided results were perceived convincing by the experts.

9.2.2 Limitations of the research

This research has focused on clarifying the purpose of the activities in the processes performed by people in the combined project organization. The underlying assumption is that unclear goals and roles or activities are not efficient, nor effective. That the developed model improves this situation is likely, but not tested in this research. To test the model, one should specifically study the primary and support activities mentioned in the model, as well as the elements formulated in the recommendations. A multi-annual study on multiple projects would be the research approach for this. Research on the management of organizations is research into continuous changing systems, with the system constantly mutating both from within (through the development of individuals) and from the outside (by events). This dynamic character by definition provides limitation to the findings of this type of research.

Still, this research searched for sustainable elements in the organizational systems. The revealed perspectives using Q-methodology, grouping apparently individual perspectives, are examples of this. The three perspectives found in the Dutch context can be considered sustainable elements in the system. In the Q-sorts performed abroad the number of foreign respondents per country is too low to indicate consistent perspectives per country.

The social network analysis of the presented study shows limitations in terms of the subjectivity of the data and the limited number of cases. It could be beneficial to base the social network analysis on more (objective) data from multiple cases. For example by expanding the use of digital data collection, like analysis of data exchange (email, phone records).

Another limitation is that the recommendations accompanying the public Value Chain are based on the composition of the perspectives with the SNA findings from Dutch cases. The connections of the primary and support activities of the project organization to the parent or-

ganization depend on the organization of the parent organization, rather than the organization of the combined project organization. Because the government's organization and the division of responsibility over public assets differs from country to country, current research results are strongly linked to the Dutch context. That is, the recommendations focus on the Dutch context. The Value Chain itself is useful in an international context given the fact that the activities are focused on the controlled production of infrastructure assets.

A limitation in the expert meeting is the limited amount of time in which the experts had to reflect on the Value Chain and the presented activities. The depth reached in the discussions was limited by the speed with which they had to oversee the model and the consequences, and also by the amount of time there was for the discussion. From literature it was already known that the quality of personal performance depends on the suitability with the culture in which performance has to be delivered (Cameron and Quinn, 1999). Possibly, this set-up, in which rapid adjustment was needed, was not suitable for all individuals to perform optimally.

9.2.3 Discussion
In each sub-study in the previous chapters, specific elements that have to be taken into account when judging the results are addressed. In the first chapter the historical context which contributed to the research question of this PhD research was outlined. Before the final results are presented in this chapter, the influence of the historical context on the results is considered. At the beginning of the 21st century the construction fraud affair, together with the job uncertainty within governmental organizations, caused a high level of distrust dominating the public private relationship in The Netherlands. This context influenced the viewpoints of participants and their actions. People who were willing to invest in more cooperative relationships accepted the invitations of the researchers to participate, to open their project organizations and to discuss the results. These people were possibly biased by their personal drive to look for opportunities to improve cooperation in combined project organizations.

9.3 Conclusions

9.3.1 Answers to the sub-questions
In order to answer the main question of this research, several sub-questions were defined and answered subsequently, prior to addressing the main research questions.

I What organizational difficulties do public project managers face?
This question was answered in Chapter 2, by studying literature, and Chapter 3, in the analysis of four projects and interviewing four public project managers. Insufficient awareness of the

strategic reasons for the collaboration is one of the reasons why the public and private project organizations ultimately failed to reach appropriate working arrangements. An identified error in these working arrangements was the lack of a link between action and consequences of this action. In the public domain, it is inevitable that a governmental owner, ultimately represented by the political level, is held responsible by citizens for things happening in the project.

The specific and mostly 'unwritten rules' and organizational procedures are a second cause of problems when tasks and operational responsibilities are transferred from public to private project partner. Literature (Chapter 2) supports this by pointing at the combination of organizational culture and personal work style for effective and efficient action; meaning effective and efficient behavior in the private parent organization is not by definition effective and efficient in the public organization (Cameron and Quinn, 1999).

The high number of partners involved is a third source of organizational difficulties. Multiple partners represent multiple owners of assets (public) and resources (private). The difficulties addressed here refer to unclear decision lines, unclear ownership and unclear responsibilities in the combined public private organization and their parent organizations. Although on both sides partners organize themselves into one project identity, later in this research (Chapter 6 and 7) it is shown that decisions on specific issues for specific assets are taken by the asset-owner or the partner-company responsible for that specific element.

The fourth element mentioned in the sub-studies was that the actual cooperative behavior on operational level appeared to be difficult. Literature suggests that teamwork-quality in the public and in the private project team, as well as between teams, is essential for project performance (Suprapto, 2016). The observations in the projects indicate clearly room for enhanced cooperation between organizational units and improved teamwork within the project organization.

Both subjects are within the influence of the project manager of the public part of the project organization. A closer examination of their perspective shows that these project managers perceive internal problems more difficult to deal with than problems with the external partner. Satisfying internal stakeholders is more of their concern than keeping the project within the *iron triangle* constraints (on time, within budget, meeting quality constraints). Public project managers constantly balance between solving project problems and keeping a constructive cooperative attitude with actors surrounding the project.

II What is project success for the public project manager?

The second sub-study contained further systematic research on the perception of success by public project managers. The outcomes presented in Chapter 4 and Chapter 5 show the

different perspectives of Dutch and Western European project managers. In line with the results of Bakker et al. (2010) we found different perspectives within a group of supposing similar respondents. The first perspective focusses on the controllability of the process up to project delivery and handover as introduced by Munns and Bjeirmi (1996). These managers were found in all participating countries. The second perspective on project success favored *fit for purpose and specific political or social factors within the given budget.* The managers representing this perspective are found in The Netherlands and Sweden. A small group of Dutch project managers form the third perspective. These managers favor *project specific political or social factors above all, followed by delivered on time.* In the last perspective public project managers are balancing between *the needs of stakeholders, shareholders, users and specific political or social factors* and the iron triangle criteria. The majority of the Belgian and Danish managers load on this factor. (Munns and Bjeirmi, 1996)

Perspective 2, 3 and 4 are in line with the findings of Baccarini (2004) where 42% of the respondents considered project success both project management success and product success (as in the result of the project). The results of this research show the diversity in this group – project managers emphasize specific elements of product success. In public private collaborative relationships in Large Infrastructural Projects, partners agree on project management success. The challenge is to understand each other's point of view on the importance of the specific elements of product success: *satisfies needs of shareholders and stakeholders, fit for purpose and specific political and social factors.*

The results in Chapter 5 indicate the existence of a managerial culture (perspective 1 and 2) or an organizational culture that can be of influence (perspective 3 and 4). Common values in the environment in which the project managers perform their daily activities can be an external factor of influence. Another explanation can be the influence of internal, personal values and the possibility that people with certain values tend to work for governmental organizations.

The success criterion *project specific political or social factors,* as added in this research, has proven to be valuable. Especially at the regional or local governmental level, where public project managers have direct contact with the responsible politician, it is a leading success criterion. This is in line with the results of Hertogh and Westerveld (2010). Chou *et al.* (2013) had similar results for success indicators in Taiwan. The *satisfaction of needs of the client,* a criterion that was left out from the Q-sort for several reasons (Chapter 4), is in essence usable but has to be divided into specific categories to be absolutely clear. Also the criteria *profitability for contractor and right process followed,* which were only mentioned sporadically in existing literature, proved to be valuable in this context. Both criteria revealed differences between the perspectives.

III How does the governmental organization influence the collaborative relationship with the project partner?

Social Network Analysis was used to explore the influence of external actors, especially the public parent organization, on the combined project organization. From Chapter 6 and 7 the influence of the external actors in general and the governmental organization specific on the collaborative relationship was captured in five assertions. The results put great focus on the different connections of a public project organization with its parent and other public organizations. The explicit distinction between a project responsible person at the client-owner, and the owner-operator in the parent organization was made. The influence of the external actors was noticeable in the project results if the contact was owner-operator and accountable for a specific sub system in the project. The accountability of the contact was on decisions about the sub system, not about the project. The project management teams are struggling with the way the accountable owner-operators should be involved, without losing grip. Also the role of licensing authority in the public parent organization was addressed and the threat of conflict of interest which makes the public project delivery organization reticent in the procedures. The addressed influences are in line with the findings of Aarseth (2012) who mentions *internal organizational challenges and external contextual challenges.* Although the mechanisms are similar, the positioning of these mechanisms from the perspectives of the combined project organization changes the concepts *internal* and *external.* (Aarseth, 2012)

As mentioned in Chapter 2, the perceptions of public private partnerships have in common that they involve an *enduring contractual cooperation between one or multiple governmental and one or multiple private organizations to accomplish an agreed target.* Both public and private partners contribute (e.g., money, property, authority, knowledge) to the partnership, in which arrangements are made about *the allocation of risk* (e.g., financial, economic, social) responsibilities, benefits and costs. This PhD research confirms this perception of public private partnership. However, project activities are performed next to each other (co-operation), hardly with each other (collaboration). A common view on the purpose of external relations and clear lines of information, responsibilities and decision-making processes from the private project organization through the public project delivery organization to public parent organization are lacking. The essential central element, the sharing of decision-making authority (De Bettignies and Ross, 2004; Hayford, 2006), was hardly found. The decision-making authority was either the project delivery organization, or the owner-operator of assets. This is hardly different from a suppliers relationship in which the governmental owners exactly decide what they want and buy it.

IV To what extent can these insights be used to improve the efficiency of the public and private actions?

The developed approach was presented in Chapter 8 and consisted of the public Value Chain (Table 9.1) and nine recommendations for the organizational structure of the combined project organization. First, explicit attention should be given to the design of the primary and support activities in the Value Chain, aiming for coherence in public and private activities towards the same success criterion. In this a distinction should be made between activities that contribute to project success and activities contributing to product success. Differences in responsibilities of partners in the primary and support activities are important issues to address when forming a shared view on decision-making, from project organization into the parent organization. In this process transparency about the public roles and organizational context of functions has to be provided by the public project delivery organization. Within the combined project organization balance should be provided between management of the primary and the support activities. Communication with the public client-owner and the private parent organization should be with equal importance on delivering the right project and delivering the project within given constraints. To represent the project in the parent organization, both partners should appoint a *Project pivot,* who is the linking pin between the parent organization and the combined project organization.

Now, public project delivery organization and private project organization, can act jointly towards external stakeholders and validate the contractual design jointly to make sure the combined project organization is producing the right result. From the beginning commitment from the stakeholder has to be ensured, including the workflow towards decision-making by the accountable stakeholders.

In the forming of a new combined project organization attention should be paid to personnel and knowledge management in the project organization. A pro-active approach from the parent organization for designing development programs for employees and monitoring required and developed knowledge will increase the efficiency of the combined project organization.

Finally, a multiple project, multi-annual agenda with the owners of public assets organized at the public parent level will enhance project efficiency.

Table 9.1. Value Chain of a combined project organization

Value Chain process	Purpose	Division of tasks and responsibilities
Primary process CPO		
Licensing		Public lead, private contribution (formulation in the contract)
Prepare		Public lead, private contribution (formulation in the contract)
Design and engineering	create:	Formulation in the contract, task always include verification
Build		Private lead, always includes verification
Turn-over		Public lead in process to client-owner and owner-operator(s)
Support activities CPO		
Project management		Public control on general processes, with private contribution included. Contractual management as part of general management, as well as scope management to be adaptive to environmental changes
Decision process management	control:	With regard to project partners and asset-owners. Public lead, private contribution
Stakeholder management		Public lead, private contribution, always include validation
Knowledge and HRM		Common subject, transparency needed for optimal effectiveness

This approach is discussed by 21 experts from public parent, public project, private project and private parent organization. The combination of free expression of thoughts in the expert meeting and structured answers on closed and open questions in the questionnaires upfront and afterwards provided a large variety of feedback on the results of this research. They agree on the applicability of the developed approach in daily practice.

9.3.2 Main research question
How should the governmental project structure be organized to support the cooperation between public and private partners towards enhanced project performance?

The outcomes of the sub-studies indicate the following:

- The project organization should be situated outside the functional structure, starting with the public project delivery organization. The interface with the parent organization should be designed with care with special attention to (1) the decision processes of owners of (future) assets, (2) cross-project assets, (3) human resource and knowledge development.

- The public project delivery organization should approach the interface with the private project partner as an internal interface. The collaborative activities must be shaped in the context of the public Value Chain. Clear distinction between primary and support activities will increase the efficiency of the activities, as the purpose of the activities are aimed at the

common formulated and accepted goals. Primary activities aim at a fit for purpose project outcome, support activities aiming at a successful project management outcome.

- The private project organization should therefor also shape the interface with their public client as an internal interface. They should look beyond their public partner into the new external interface. The responsibilities for both partners in the value chain of the combined project organization should be clear to both partners in the combined project organization.

- The combined project organization should pay more attention to the navigation of the project into society. Enabling leadership to balance between administrative structures and adaptive capabilities should be added next to the (internal) management of the project organization.

Overview

The context in which infrastructural projects are executed is complex for many reasons. Complexity is visible in decision making processes and does not disappear or fade away towards the end of a project (Hertogh and Westerveld, 2010). In this PhD research technical, organizational and environmental complexity, elements of complexity mentioned by Bosch-Rekveldt (2011), can be recognized. Several issues connected to technical complexity were found in the cases, both in Chapter 3 and in Chapter 6 and 7, like unclear goals, uncertainties in scope, a high variety in tasks and technical risks. Issues connected to organizational complexity can also be recognized, though less prominent. The lack of resources, skills and experiences with parties involved can be found in the sub-studies in the mentioned chapters. Issues related to environmental complexity are expressed by the project managers in the interviews. Whether they were interviewed in an explorative way (Chapter 3), in a semi-structured manner (Chapter 7) or the interview protocol was mostly structured (Chapter 4 and 5) issues like the variety of external stakeholders' perspectives, dependencies on external stakeholders and the interface with the existing environment were prominently present. Hertogh and Westerveld (2010) labeled this social complexity. In their research the project delivery organization served as an intermediate between different stakeholders. In the relationship between the project delivery organization and their parent organizations they grow in organizational complexity. The importance of integrated teams for dealing with this complexity was mentioned by Bosch-Rekveldt (2011), and, more important, the need to prepare the integrated project team for what complexities and risks might arise during the projects phases. Suprapto (2015) showed that regardless the contract types and incentives, collaborative relationships should be designed and applied through day-to-day managerial attention for team-working, meaning paying constant attention to the quality of processes on the interface between their organizations. Taking this another step further, this research added the specific organizational activities that should be designed

jointly by project partners, from source to decision. The public Value Chain in which these activities are positioned is recognizably connected to primary (creating) or supporting (control) activities in the combined project organization. Hertogh and Westerveld (2010) also mentioned the need for control and interaction within a public project delivery organization. A mixture of both is necessary to manage the projects though the dynamic environment over time. This research additionally, separates the parent organization from the project organization on both public as well as private side and integrates the project delivery organization with the project organization of the private partner. Though similarity in issues are recognizable in the works of Suprapto (2015) and Hertogh and Westerveld (2010) the public Value Chain as developed here, positions the issues within the contexts of the two most important involved organizational elements: the public project delivery organization and the private project organization. The relationships that have to be managed are related to the primary and secondary activities. The combined project organization can only succeed if the project is correctly and sufficiently connected to the different stakeholders, adaptive to environmental influences and able to keep asset-owners influences limited to the asset they own. As Van Marrewijk (2010) observed projects are executed by engineers and managers who work hard to get good results, but information comes from many different sides and is not always available to the decision makers on time. This research positions the actions within the organization in line with their intended purpose and connects them to the ultimate responsible asset-owners. This research offers a framework that can help the public and private project organization in their struggle to organize trustworthy processes, and to find a balance between complementarity to each other and the responsibility for their own contribution. In line with the English designation of collaboration in the sense of complementary action, this public Value Chain provides the framework to position and delimit the activities of the partners in the context of the project environment.

In response to the question how to combine flexibility and creativity with administration and coordination structures Uhl-Bien (2006) formulated *enabling leadership.* The enabling activities manage both organizational conditions of the administrative processes as well as help new (innovative) solutions from adaptive cells upward, through the formal system to the organization interface. To merge administrative and adaptive elements into organizational roles, Uhl-Bien (2006) mentioned three important mechanisms and illustrates their usage on strategic and organizational level based on Jacques (1989). These mechanisms are 1) fostering interaction, (2) fostering interdependency, and (3) injecting adaptive tension to help motivate and coordinate the interactive dynamics. These mechanisms suit the activities and their purposes as seen in this PhD research. The combined project organization can be managed by enabling processes.

9.4 Scientific contribution

The developed public Value Chain is built upon earlier research. Some elements of this research confirm the findings of earlier research, and some contribute new elements to the scientific field. To start with, the approach of a project team of an infrastructure project as temporary organization, for instance by Turner and Muller (2003), Cox *et al.* (2006) or Lundin and Söderholm (1995), is supported by this research. The features of infrastructure projects (like the type of actions, timeframe, personnel) legitimize the approach of the project team as a temporary production organization. The organizational elements (time, team, task, transition) mentioned by Lundin and Söderholm (1995) are fitting in the new context of a combined production organization. Based on the analysis of fourteen dissertations to the subject PPP in the Netherlands and Flanders, Hueskes *et al.* (2016) called on future researchers to transcend a specific public or private point of view. The positioning of both perspectives in a joint CPO offers the possibility to do so. Not the CPO but the external interfaces of the CPO should be the subject of research.

In the sub-studies in which the Q-sorts were performed, a contribution to further developments in science is made in various ways. First, by emphasizing the importance of clear consideration of the viewpoint from which project success is considered. This is also addressed in existing research of for instance Chan et al. (2004), Koppenjan *et al.* (2011) and Kort (2005). Therefore, researchers should be much more precise in describing their respondent groups in upcoming publications. But above all, this research reveals that even in a seemingly homogeneous group, there are significant differences in the perception of project success. Except for Bakker *et al.* (2010) and this study, little attention has been paid so far to differences in success criteria within a respondent group.

Winch (2014) proposed a focus on the interfaces between the project, the owner and the project based firm. This researcher analyzed that relatively little attention had been given so far to research on project organizing on the interfaces between the temporary organization and permanent organization. He explicitly mentioned two different types of permanent organization that configure a project: (1) owner and operator and (2) project based firms (Winch, 2014). The findings in Chapter 6 and 7, in which the network surrounding a combined project organization was mapped, contribute to this appeal. It also supports to the appeal of Winch and Leiringer (2016) to pay more attention to organizing projects by permanent owners. The separation between owner-operator and client-owner as introduced by these researchers, has proven to be very useful in this research. In future researches this distinction can contribute to clarify the problematic approach of private organizations towards public organizations as mentioned by Klijn *et al.* (2008) and Ng *et al.* (2002).

The public Value Chain offers a framework in which several research perspectives on the subject of collaboration in projects can be positioned. It contributes to research at strategic level, into the organizational fit (or the lack of it) for public private partnerships. For instance it addresses elements that Akinoye *et al.* (2009) labeled important for a private partner to have a clear view on before entering a partnership with a public organization: hierarchical organizational structure of the parent organization, the client's key activities and processes that have impact on the project, decision-making structures and the interface with the project organization. The public Value Chain offers the opportunity to address these important elements during the procurement phase and at the start of the collaboration in the project. It supplements Van Ham and Koppenjan (2002) by recognizing that explicit agreements between actors about activities and the specific contributions of partners are needed to facilitate trust. The public Value Chain contributes to this, without falling back on contractual tools. The division in primary - creating - activities and support - controlling - activities helps to position specific research on these processes. For controlling processes, see literature on for instance (joint) risk management (Rahman and Kumaraswamy, 2004), isochronism and timing norms (Dille and Söderlund, 2011) and relationship management (Smyth and Edkins, 2007). This research helps to position other research in the organizational context of the system.

9.5 Recommendations

9.5.1 Recommendations for organizing public private collaboration

As mentioned in Section 1.2, at the beginning of the 21st century the infrastructure industry in The Netherlands was characterized by distant, competitive relationships. In reaction to that in 2011 the wish for another approach was expressed by a group of public and private project managers. At that time the contract forms that offer the possibility for partnering were introduced, but little partnering behavior was seen in projects resulting in poor project performance (Bresnen and Marshall, 2000). In 2016 the wish for partnering behavior is expressed openly in The Netherlands (Rijkswaterstaat, 2016)). Anvuur and Kumarashwamy argue that the relationship between partners develops from competition trough cooperation and collaboration to coalescing (Anvuur and Kumarashwamy, in Smyth & Prycke, 2008). This research observed the relationship between public and private partners in the period 2011 to 2016. Observing all results from a higher level, it is argued that the construction industry today is looking for a way to cooperate. The desired collaboration is the next step. Combining cooperation, collaboration and coalescing into one term *partnering* leads to confusion, different expectations, disappointment and despite good intentions, it can ultimately lead to loss of trust or confirmation of distrust.

The public Value Chain offers a stable model for potential partners to discuss the cooperation in the project, to act according to the agreed division of tasks and responsibilities. The project teams can be better equipped and instructed for their specific contribution to the project and therefore work more efficient. The insights in the specifics of the contribution of their partner will help the project teams to align the processes between the teams. And by doing so, they increase the contribution of their organization to an efficient process.

The public Value Chain offers the possibility to use the same model in several projects and to establish a collective idea of cooperation in the construction industry. The connection of (contractual) responsibilities to individual tasks and activities to common goals will contribute to a shared view on decision-making, from project organization into the parent organization. The activities that bind the project activities to the decision makers satisfy the parent organizations desire for control. Expectations of parent organizations now can be aligned with expectations of the combined project organization. The specific subjects mentioned in the relationship with the parent organization can prevent the combined project organization to become 'too autonomic'. The conflict between team identity and wider organizational culture as mentioned by Bresnen and Marshall (2000) is less likely to occur. So using the public Value Chain as a framework contributes to clear expectations and through that to gaining or keeping trust in each other.

In combined project organizations of infrastructure projects seldom the same people work together. A common template for activities contributes to the creation of a common culture in which employees can perform effectively (Dubois and Gadde, 2002). Overall this research contributes to the development of a branch specific inter-firm organizational culture. Using the public Value Chain for multiple projects leads to uniformity which contributes to a common infrastructure project culture. This can provide a basis for more efficiency in the individual performance. The industry is recommended to use the public Value Chain and the accompanying recommendation to optimize cooperation, before taking the next step into collaboration. The model is usable to take this step, and further to coalescing. The challenge for the industry is to find the right pace to create a stable common culture. The public Value Chain offers a stable basis to build upon.

9.5.2 Research recommendations

No literature study was performed on the primary activities. In hindsight this is an interesting element to look further into. Is there former research that can be specifically positioned in the primary activities of a producing organization? The traditional management literature on financial subjects for instance can be split into cost controlling, as an element that should be positioned in the control track (support activities), and for instance value management, which can

be considered an element in the create track (primary activities). Usually a cost benefit analysis is performed to substantiate an investment decision. With the necessary adaptive ability and flexibility in the public Value Chain in mind, it is interesting to perform further research on the possibilities and effects of making a cost-benefit analysis on each baseline to enhance management success.

The expansion abroad would be a meaningful addition to this research. An additional number of respondents per country in the Q-sort will contribute to more sustainable perspectives per country. Expanding Social Network Analysis in several cases in other countries might open the possibility to appoint a specific focus in the primary and secondary activities in the Value Chain.

Another element for further research is the way project managers balance between primary and support activities. As indicated, the management literature is much more about the support activities. Literature that addresses the primary activities in organizations can be found in organizational science and business development where leadership is discussed, for instance Uhl-Bien (2007) or Havermans (2014). How do the leaders of projects stimulate the creativity in their projects? Especially in a world in which technological possibilities increase every day, the creative response in the project organization has to be enlarged to make it possible for the combined project organization, despite years of preparation and execution, to still reach for project success.

Although the outer sides of the combined project organization are equal in each project, the alignment with the activities of the public Value Chain is crucial. In today's contracting practice little flexibility is provided to make this task-sharing project specific. It is not just the tendering period, but also the coherence between the procurement procedure and the start of a combined project organization. The bottlenecks in order to achieve an agreed division of tasks, without the public project delivery organization being the dominant party, are worth an in-depth study.

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Appendix I

Questionnaire of the exploratory interviews (Chapter 3)

Achtergrond

Het afgelopen decennium ben ik bij meerdere grote civieltechnische projecten betrokken geweest. Hoewel de projecten betrekking hadden op zeer diverse bouwwerkzaamheden en op verschillende fasen van het bouwproces hadden ze ten minste één ding gemeen, namelijk de intentie van overheid en bedrijfsleven om samen op te trekken om het project voor elkaar te krijgen. Maar hóe je dat uiteindelijk doet, met elkaar werken als één team, is in mijn ervaring toch lastiger dan gedacht. Vanuit de overtuiging dat samenwerking uiteindelijk leidt tot een betere totaal prestatie, ben ik gestart met een onderzoek naar doorslaggevende factoren in een samenwerkingsrelatie.

Doel van het interview

Het doel van het interview is inzicht te verkrijgen in het organiseren en besturen van samen-werkingsrelaties gebaseerd op uw persoonlijke ervaring in projecten. Het interview duurt on-geveer 60-90 minuten. Alle informatie die in het interview wordt prijsgegeven zal strikt vertrou-welijk worden behandeld.

Interviewvragen

1. PROFIEL VAN DE PERSOON   **(5 MIN)**

a. Naam en contactgegevens
b. Werkgever en afdeling
c. Hoeveel jaar werkervaring heeft u?
d. Hoe lang werkt u al in deze functie?
e. Bent u altijd in overheidsdienst geweest of bent u overgestapt uit het bedrijfsleven?
f. Indien overgestapt uit het bedrijfsleven, wanneer heeft u de overstap gemaakt? *(jaartal)*

2. PROFIEL VAN HET PROJECT   **(5 MIN)**

a. Op welk project wilt u met name verder ingaan?
Keuze: 1 specifiek project, bij voorkeur afgerond (of ten minste fase afgerond). Criterium is project waarbij de gesprekspartner verantwoordelijk was voor de samenwerkingsrelatie met een marktpartij. Let op bij project waarin 1 fase is afgerond dat dit doorwerkt in de rest van het interview.

Enkele feitelijke kenmerken van dit project:

b. Wanneer is het project gestart (planvorming)?
c. Wanneer is het project afgerond (oplevering)?

d. Wat zijn de (evt. geraamde) kosten voor het totale project (incl. uitvoeringskosten)?
   i) < EUR 10 mln
   ii) EUR 10 – 100 mln
   iii) EUR 100 mln – 1 mld
   iv) > 1 mld EUR
e. Was het project:
   i) op tijd gereed?
   ii) binnen budget afgerond?
   iii) met de afgesproken kwaliteit opgeleverd?
f. In welke fase(n) was u projectmanager van dit project?
   (planvorming, ontwerpuitwerking, contractvoorbereiding, uitvoering, gehele looptijd)
g. Wanneer bent u gestart als projectmanager van dit project? *(jaartal)*
h. Wanneer is uw betrokkenheid bij het project gestopt (indien van toepassing)? *(jaartal)*
i. Wat is het budget van het contract waar u verantwoordelijk voor was?

Hierna wil ik graag verder ingaan op de samenwerkingsrelatie met de marktpartij.

3. DE SAMENWERKING (40 MIN)

a. Met wie werkte u samen in het project?
   Vraag is bewust open geformuleerd omdat ik geïnteresseerd ben of de desbetreffende PL bij deze vraag ook opdrachtgevende partijen als samenwerkingspartijen ziet. En als dat zo is, dan kan ik dat bij deze isoleren van de marktpartij. Benoem hierbij de gelaagdheid van samenwerking: triviale samenwerking (faciliterende betrokkenen), globale samenwerking (betrokkenen met indirecte invloed op het project), professionele samenwerking (betrokkenen met directe relatie met het projectresultaat).
b. Hoe is de samenwerking tot stand gekomen?
c. Waarom is gekozen voor deze partner?

De volgende vragen gaan over de verwachtingen die u had voorafgaand aan de samenwerking. Hoewel het beeld ondertussen mogelijk gekeurd is door het verloop van de samenwerking, vraag ik u in gedachten terug te gaan naar de periode voordat de samenwerking bestond. De volgende vraag gaat over het beeld dat u toen had.
d. Wat waren uw verwachtingen van de samenwerking?
   i) Welke inbreng verwachtte u van de partner? *(geld, grond, kennis, kwaliteiten, vaardigheden)*
   ii) Welke instelling verwachtte u van de partner? *(flexibiliteit, slagvaardigheid, betrokkenheid, transparantie)*
e. Op welke wijze is de samenwerking contractueel vormgegeven?
   i) Alliantie
   ii) Joint Venture
   iii) Samenwerkingsovereenkomst
   iv) DBFM(O)-contract
   v) D&C-contract
   vi) Anders, namelijk
f. Was er sprake van financiële prikkels in de samenwerkingsrelatie (ja/nee)? Vond u deze effectief om samenwerking te stimuleren? Waarom? *(wel/niet)*
g. Welke verwachtingen zijn waargemaakt gedurende de samenwerking en welke verwachtingen niet. Let op dat de onderdelen uit vraag 3d terugkomen?
   i) Welke inbreng heeft de partner in het project gehad? *(geld, grond, kennis, kwaliteiten, vaardigheden)*
   ii) Welke instelling heeft de partner getoond? *(flexibiliteit, slagvaardigheid, betrokkenheid, transparantie)*
h. Hoe is de samenwerking gerealiseerd?
i. Welke problemen/uitdagingen heeft u ervaren in de samenwerkingsrelatie? Hoe ging u om met deze problemen?
j. Hebben er veranderingen in de samenwerking plaatsgevonden? Zo ja, welke en wat was de aanleiding voor de verandering? Wat was het effect van de verandering?
k. Heeft u uw manier van aansturen gedurende het project aangepast? Hoe en waarom?
   Indien van toepassing doorvragen naar wie bij deze acties betrokken waren (welk niveau), wanneer ze hebben plaatsgevonden (moment in project), wat de aanleiding was en wat het effect van de acties
l. Is er tijdens de looptijd van het project sprake geweest van conflictsituaties tussen de organisaties? Hoe zijn de conflictsituaties opgelost?

4. **RESULTAAT**   **(10 MIN)**
a. Bent u tevreden over de bijdrage van uw eigen organisatie aan de samenwerking in dit project? Welke ele-
    menten vindt u hierin van doorslaggevend belang in het succes?
b. Heeft de samenwerking een vervolg gekregen? En zo ja, op welke wijze?
c. Op welke wijze is het project volgens u een succes? (Ik heb hier 20 kaartjes die succes beschrijven, kunt u er
    5 kiezen die voor u het belangrijkst zijn geweest in dit project?)
d. Om welke reden is het project volgens u <u>geen</u> succes?

5. **AFSLUITING**   **(5 MIN)**
a. Zijn er onderwerpen niet ter sprake gekomen, die u nog ter sprake wil brengen?
b. Hartelijk dank voor uw medewerking. Ik maak van dit gesprek een verslag. Wilt u dit verslag inzien en mogeli-
    jk aanpassen?
c. Zou U verder betrokken willen blijven bij het onderzoek naar goed opdrachtgeverschap bij samenwerk-
    ingsverbanden?

Nogmaals dank voor uw medewerking.

Appendix II

Definition of the success criteria (Chapter 4)

To prevent misinterpretation of the criteria, definitions are set up for each of the criteria. In the interview protocol the respondent was presented with this list of criteria and definitions and the researcher made certain that it was read well and the definitions and criteria were fully understood.

Table II.1 Criteria from literature

Criterion from literature	Definition in concourse	Criterion in Q-sort	Definitions provided to respondents
1. Iron triangle: Cost	*"Costs (…) is the overall cost that a project incurs from inception to completion, so it includes any costs [that] arise from variations, modification during the construction period and the cost created by legal claims, such as litigation and arbitration."* "Percentage net variation over final costs (%NETVAR) is the ratio of net variations to final contract sum expressed as a percentage. It gives an indication of cost overrun or underrun" (Chan, 2001).	Within budget	The total costs do not exceed the original budget.
2. Iron triangle: Quality	*"The workmanship guidelines provided to contractors by clients at the commencement of project execution."* (Chan, 2001) "Quality (…) is usually referenced to and measured by the degree of conformance to a predetermined standard of performance" (Parfitt and Sanvido, 1993).	Quality	The project meets the technical requirements that were determined beforehand; it performs as it is supposed to perform and meets a presupposed standard of quality.
3. Iron triangle: Time	"Time is the duration for completion of the project. (…) *Construction Time* is the absolute time that is calculated as the number of days/weeks from start on site to practical completion of the project (…) (Chan, 2001).	Delivered on time	The total duration of the project does not exceed the planned duration.
4. Satisfies needs of consumers users (perceived performance)	This criterion relates to the appreciation by the users. The 'users are those who actually work or live in [or utilize] the final products [in some other way]." (Chan, 2001)	Satisfies needs of users	The end users are satisfied with the final functionality of the project.

Criterion from literature	Definition in concourse	Criterion in Q-sort	Definitions provided to respondents
5. Satisfactory (commercial) benefit to client organization	The *"(direct) benefits of projects to the performing organization are focused on profits, market share, and other business related results"* (Shenhar et al., 2001).	Project specific political or social factors Based on the test interviews rewritten to public equivalent.	
6. Technical performance (meets technical objectives	The *technical performance* relates to *"… whether or not the project works as it is intended to work."* (Pinto and Slevin, 1988). In case of good technical performance the project '[meets] the specifications of the technical requirements" (Chan et al., 2002).	Based on the test interviews included in the definition of Quality.	
7. Satisfies need of client	*"The client initiates the project to fulfill a specific need. What aspects and factors does the client value in judging the success of the project"* (Westerveld, 2003) and have these aspects and factors been achieved.	In the public context represented in either "benefit to client organization" or "personal growth and development" or "project specific political and social factors."	
8. Satisfies needs of stakeholders	"Project stakeholders [are] defined as people or organizations who have a vested interest in the environment, performance and/or outcome of the project." (Bryde and Robinson, 2005b) "[These} parties (…) are not directly involved in the project but have a great influence. For example, environmental groups. citizens and government agencies. These parties manage their specific interest" (Westerveld, 2003).	Satisfies needs of stakeholders	The stakeholders of the project are defined as those people and/or organizations that have an interest in the environment, performance and/or outcome of the project;
9. Achievement of purpose/fit for purpose	The project best solves the problem for which it was initiated; given the other alternatives it was the best choice (Pinto and Slevin, 1988)	Fit for purpose	The project forms the best solution for the problem for which it was initiated; it is the best choice given the different alternatives.
10. Satisfies needs of project team	"The workers of the project will be concerned with reaching their personal goals, as well as a good working atmosphere" (Westerveld, 2003).	Satisfies needs of project team	The employees of your project team are able to achieve their personal goals and there is a good working atmosphere.

Criterion from literature	Definition in concourse	Criterion in Q-sort	Definitions provided to respondents
11. Commercially profitable for contactor	"Profitability measures the financial success of the project", which for a commercial party, like the contractor, is the main objective for taking on a project (Chan et al., 2002). "They are also concerned with getting new orders and learning possibilities" (Westerveld, 2003).	Profitability for contractor	The contractor is able to profitably execute his part of the project.
12. Efficient use of allocated resources	"Efficiency is the measure of productivity. It compares the input required to produce a given level of output and is concerned with the means to the end" (Wit, 1986). It is especially related to the efficient use of allocated resources.	Efficient use of the available resources	The resources (capital, labor, materials) allocated to the project, are used in the most cost-efficient and time-efficient manner.
13. Safety	"Degree to which the general conditions [and management] promote the completion of a project without major accidents or injurie." (Bubshait and Almohawis, 1994).	Safety	Within the project attention is paid to a safe design and the prevention of accidents during execution, use and maintenance.
14. Educational aspects for organization (learning benefits)	What an organization learns from a project (e.g., new knowledge, experience, techniques) can be important, as it can be used to improve the organization's performance and competitiveness(Love et al., 2000).	Learning opportunities for client organization	The client organization learns from this project (e.g. acquiring new knowledge, new experiences, becoming familiar with new technologies) and this knowledge will be applied in subsequent projects to improve the performance of the organization.
15. Personal growth and development	Personal development relates to identifying the personal expectations and attributes of the operational client (project manager) which are further "(…)"developed through the experience of the project" (Turner, 2007)	Personal growth and development	You are able to professionally and personally develop through experiences gained from this project.
16. Preparing for the future (new market, new product line, new technology)	This criterion refers to the "long term benefits for the organization" and "addresses the issue for preparing the organizational and technological infrastructure for the future". It encompasses "new opportunities for further markets, ideas, innovations, products, (…) new skills, (…) new technologies and core competencies" (Shenhar *et al.,* 2001)	*In the public context included in the definition of "learning opportunities for client organization"*	

Criterion from literature	Definition in concourse	Criterion in Q-sort	Definitions provided to respondents
17. Absence of conflicts / legal claims	During the project a "minimized [number of] construction aggravation, disputes and conflicts occur" (Toor and Ogunlana, 2010).	*Excluded because of the minimum occurrence in the literature.*	
18. Impact on the environment, sustainability	"Impacts of a construction project on the environment are notoriously negative," especially in relation to waste generation and the emission of air pollutants. Aiming at building sustainably can diminish the negative environmental impact (Chan *et al.*, 2002).	Impact on the environment, sustainability *Included because of the presumed relevance based on governmental documentation.*	Within the project the effects of construction activities on the environment are taken into consideration.
19. Managerial and organizational implications	The effects of the resultant system on the organization.	*Not included because of the minimum occurrence in literature.*	
20. Satisfies finance providers (if not same party as client)	The project satisfies the needs and expectations of the people that provided the financial resources for the project.	Satisfies needs of shareholders *Initially excluded because of the minimum occurrence in literature, but included in the final set because of the presumed relevance in test interviews.*	The shareholders are the co-financers of the project, but they are not the commissioning party. They have interests in the project, which they are able to promote.
21. Right process is followed	"The right process is being followed to successfully deliver the required .end deliverables in the optimum way" (Turner and Müller, 2004a)	Right process was followed *Initially excluded because of the minimum occurrence in the literature, but included in the final set because of the presumed relevance in test interviews*	The right process is followed throughout the project to deliver an optimal end product.
22. Terminated reasonably/ effectively	"[The project] is terminated reasonably and effectively if it needs to be cancelled (Wateridge, 1995).	*Not relevant considering the P-set*	
23. Economic impact on surrounding community	A project will also have indirect benefits to "a wider stakeholder community (indirect benefits)", an important one of these indirect benefits is the "economic impact [of the project] on the surrounding community" (Atkinson, 1999).	*Excluded because of the minimum occurrence in literature.*	

Criterion from literature	Definition in concourse	Criterion in Q-sort	Definitions provided to respondents
24. Professional image	"… a project must be properly managed (…) to [maintain or improve] reputations" of the main organization (Parfitt and Sanvido, 1993).	Effect on the professional image of client organization *Initially excluded because of the minimum occurrence in the literature, Included in the final set because of the presumed relevance in test interviews.*	The project has a positive effect on the professional image and reputation of the client organization.
25. Reduced conflicts and disputes	"Minimized construction aggravation, disputes and conflicts". (Toor and Ogunlana, 2010).	Good working relationship with contracting partners *Initially excluded because of the minimum occurrence in the literature, included in the final set because of the presumed relevance in test interviews in.*	The working relationship with the contracting partners is good; there are no conflicts or disputes.
	No in the literature, Included in the final set because of the presumed relevance in test interviews occurrence	Continuation of client organization	The project contributes to the continuation of the client organization and to achieving the organization's goals.

Appendix III

Complete list of factor scores (Chapter 4)

To prevent misinterpretation of the criteria, definitions are set up for each of the criteria. In the interview protocol the respondent was presented with this list of criteria and definitions and the researcher made certain that it was read well and the definitions and criteria were fully understood.

Table III.1 Factor score (Z-score) per perspective

Success criteria	Factor score		
Perspective	1	2	3
Continuation of client organization	-1,424	-1,428	-0,074
Delivered on time	-0,036	0,655	1,66
Effect on the professional image of client organization	0,311	0,124	0,8
Efficient use of the available resources	-1,114	-0,836	-0,483
Fit for purpose	0,48	1,176	-0,583
Good working relationship with contracting partners	-0,634	-0,417	-0,318
Impact on the environment, sustainability	0,622	-0,378	0,398
Learning opportunities for client organization	-0,48	-0,31	-0,154
Personal growth and development	-1,282	-0,586	-0,88
Profitability for contractor	-0,275	-2,119	-1,109
Project specific political or social factors	0,297	1,444	1,988
Quality	0,48	0,589	0
Right process is followed	-1,881	-0,186	0,419
Safety	2,048	-0,059	1,055
Satisfies needs of project team	-0,623	-0,959	-0,08
Satisfies needs of shareholders	0,623	-0,329	-2,131
Satisfies needs of stakeholders	0,971	1,247	-1,177
Satisfies needs of users	0,792	0,778	0,748
Within budget	1,126	1,592	-0,08

Appendix IV

Features of respondents and their projects (Chapter 5)

Table IV-1 Features of respondents and their projects

Resp.	Governmental level	Civil Engineer	Previous experience	Contract	Budget
B02	regional	yes	public	Other	< 50 M
B04	regional	yes	army	design and construct	50 - 100 M
B05	local	yes	both	engineering and construct	< 50 M
B06	local	yes	both	engineering and construct	> 1 B
B07	local	yes	both	engineering and construct	> 1 B
D01	national	yes	public	design and construct	500 M - 1B
D02	national	yes	public	design and construct	500 M - 1B
D03	national	yes	public	none yet	100 - 500 M
D04	national	no	public	bid and build	50 - 100 M
D05	national	yes	public	bid and build	100 - 500 M
D06	national	yes	public	design and construct	100 - 500 M
D07	national	yes	both	bid and build	100 - 500 M
D08	national	yes	public	bid and build	100 - 500 M
D10	national	yes	public	design and construct	500 M - 1B
F01	national	yes	public	none yet	< 50 M
F02	national	yes	public	design and construct	< 50 M
F03	national	yes	both	design and construct	100 - 500 M
F04	national	yes	both	design and construct	100 - 500 M
F05	national	yes	public	other	50 - 100 M
F06	national	yes	public	design and construct	< 50 M
F07	national	yes	both	differs	500 M - 1 B
F08	national	yes	both	bid and build	100 - 500 M
F10	national	yes	both	bid and build	< 50 M
N01	national	no	public	design and construct	100 - 500 M
N02	national	no	public	design and construct	50 - 100 M
N03	national	no	private	design and construct	50-100 M
N04	national	yes	private	design and construct	< 50 M
N05	national	no	public	differs	50 - 100 M
N06	national	no	private	design and construct	100 - 500 M
N07	local	yes	public	bid and build	50 - 100 M
N08	local	no	public	design and construct	100 - 500 M
N09	local	yes	both	bid and build	100 - 500 M
N10	local	no	semi-public	design and construct	< 50 M
N11	local	no	public	engineering and construct	< 50 M
N12	local	no	public	bid and build	< 50 M
N13	local	yes	public	bid and build	< 50 M
N14	local	no	public	bid and build	< 50 M

Resp.	Governmental level	Civil Engineer	Previous experience	Contract	Budget
N15	local	yes	public	design and construct	< 50 M
N16	national	no	private	engineering and construct	< 50 M
N17	national	yes	semi-public	design and construct	100 - 500 M
N18	regional	yes	both	bid and build	< 50 M
N19	regional	no	private	bid and build	< 50 M
N20	regional	no	public	differs	100 - 500 M
N21	regional	no	private	bid and build	< 50 M
N22	regional	no	both	engineering and construct	< 50 M
N23	regional	no	semi-public	none yet	< 50 M
N24	regional	yes	both	engineering and construct	50 - 100 M
N25	regional	yes	public	design and construct	100 - 500 M
N26	regional	yes	public	differs	100 - 500 M
S01	national	yes	both	design and construct	100 - 500 M
S02	national	yes	both	design and construct	500 M - 1 B
S03	national	yes	both	design and construct	> 1 B
S04	national	yes	both	none yet	> 1 B
S05	national	yes	both	design and construct	500 M - 1 B
S06	national	yes	both	none yet	100 - 500 M
S07	national	yes	both	differs	> 1 B
S08	national	yes	both	bid and build	> 1 B
S09	national	yes	both	bid and build	> 1 B
S10	national	yes	both	differs	100 - 500 M
S11	national	yes	both	design and construct	500 M - 1 B
UK02	national	no	both	design and construct	500 M - 1 B
UK03	national	yes	public	other	> 1 B
UK04	national	yes	both	design and construct	500 M - 1 B
UK05	national	yes	army	bid and build	> 1 B
UK06	national	no	both	bid and build	> 1 B
UK07	national	yes	army	design and construct	> 1 B
UK08	national	yes	both	other	500 M - 1 B
UK10	national	no	both	design and construct	> 1 B

Appendix V

Factor scores of respondents Q-sort (Chapter 5)

Table V-1 Factor scores of respondents Q-sort

Respondent	Factor 1	Factor 2	Factor 3	Factor 4	Significance
N01	0.112	0.441	0.719 **	0.123	P>0.01
N02	0.009	-0.003	0.024	0.510 **	P>0.05
N03	0.518 **	-0.145	0.167	0.035	P>0.05
N04	0.384	0.031	0.325	0.551 **	P>0.05
N05	0.065	0.116	0.648 **	-0.075	P>0.01
N06	0.137	-0.028	0.810 **	0.112	P>0.01
N07	0.253	0.178	0.199	0.751 **	P>0.01
N08	0.111	0.632 **	0.513 *	-0.084	P>0.01
N09	0.274	0.314	-0.168	0.639 **	P>0.01
N10	-0.096	0.441	0.420	0.245	non-loader
N11	-0.022	0.267	0.652 **	0.429	P>0.01
N12	0.022	0.721 **	0.299	0.369	P>0.01
N13	0.219	0.579 **	0.190	0.013	P>0.05
N14	0.416	0.617 **	0.119	0.421	P>0.01
N15	0.210	0.642 **	0.143	0.466 *	P>0.01
N16	0.266	0.240	0.111	0.606 **	P>0.01
N17	0.752 **	0.281	-0.095	0.254	P>0.01
N18	-0.347	0.356	0.512 *	0.217	non-loader
N19	-0.254	0.563 **	0.081	0.458 *	P>0.05
N20	0.294	0.535 *	0.000	0.607 *	confounder
N21	0.308	0.103	0.640 **	0.066	P>0.01
N22	-0.125	0.672 **	0.088	0.271	P>0.01
N23	0.199	0.654 **	0.215	-0.058	P>0.01
N24	0.471 *	0.405	0.127	0.563 *	confounder
N25	0.419	0.261	-0.052	0.154	non-loader
N26	-0.036	0.733 **	0.110	0.316	P>0.01
B02	0.584 **	0.191	0.289	-0.004	P>0.05
B04	0.383	0.428	0.115	0.352	non-loader
B05	0.185	0.520 *	-0.012	0.605 **	P>0.01
B06	0.437	0.597	0.086	0.486 *	confounder
B07	-0.003	0.191	0.119	0.691 **	P>0.01
D01	0.615 **	0.086	0.127	0.045	P>0.01
D02	0.157	0.127	0.005	0.724 **	P>0.01
D03	0.432	0.167	0.485 *	0.335	P>0.05
D04	0.206	0.157	-0.307	0.728 **	P>0.01
D05	-0.079	0.320	0.118	0.726 **	P>0.01
D06	0.791 **	0.348	0.102	0.038	P>0.01
D07	0.153	0.152	0.204	0.785 **	P>0.01

Respondent	Factor 1	Factor 2	Factor 3	Factor 4	Significance
D08	0.618 **	0.003	-0.019	0.403	P>0.01
D10	0.455 *	0.514 *	-0.163	0.205	confounder
F01	0.616 **	0.379	0.343	-0.003	P>0.01
F02	-0.016	-0.420	0.359	0.684 **	P>0.01
F03	0.728 **	0.041	0.177	-0.096	P>0.01
F04	0.794 **	0.018	-0.123	0.472 *	P>0.01
F05	0.745 **	0.446	0.255	-0.184	P>0.01
F06	0.765 **	0.011	0.012	-0.146	P>0.01
F07	0.840 **	0.129	0.274	-0.045	P>0.01
F08	0.675 **	0.239	0.028	0.095	P>0.01
F10	0.686 **	0.063	-0.144	0.286	P>0.01
S01	0.530 **	-0.220	0.429	0.070	P>0.05
S02	0.284	0.093	0.328	0.047	non-loader
S03	0.094	0.557 *	0.273	0.682 **	P>0.01
S04	0.214	0.321	-0.050	0.643 **	P>0.01
S05	0.597	0.394	-0.211	0.464 *	confounder
S06	0.490 **	0.021	0.286	0.348	P >0.05
S07	0.670 **	0.094	-0.373	0.399	P>0.01
S08	0.718 **	0.301	-0.063	0.370	P>0.01
S09	0.754 **	-0.074	0.179	0.424	P>0.01
S10	0.548 *	0.608 **	-0.056	0.050	P>0.01
S11	0.733 **	-0.026	0.179	-0.022	P>0.01
UK02	0.667 **	0.005	0.111	0.545 *	P>0.01
UK03	0.100	0.021	-0.257	-0.311	non-loader
UK04	0.717 **	-0.166	0.116	0.398	P>0.01
UK05	0.813 **	-0.073	-0.022	0.244	P>0.01
UK06	0.653 **	0.411	-0.403	0.244	P>0.01
UK07	0.771 **	0.357	0.075	0.301	P>0.01
UK08	0.476 *	0.543 *	-0.082	0.327	confounder
UK10	0.795 **	0.335	0.107	-0.029	P>0.01

* meets condition 1 (significant loading at p < 0.05)

** meet condition 1 and condition 2 (the highest loading2 > h2/2)

Appendix VI

Factor score with corresponding position (Chapter 5)

Table V-1 Factor scores of respondents Q-sort

| Perspective | 1 | | 2 | | 3 | | 4 | |
Success criterion	score	pos.	score	pos.	score	pos.	score	pos.
Continuation of client organization	-0.80	-1	-1.29	-2	-0.07	0	-1.37	-2
Delivered on time	1.29	1	0.54	1	1.45	2	1.74	3
Effect on the professional image of client organization	-0.82	-1	0.14	0	1.08	1	-0.18	0
Efficient use of available resources	0.04	0	-0.43	-1	-0.67	-1	-0.96	-1
Fit for purpose	0.26	1	1.81	3	-0.77	-1	-0.21	0
Good working relationship with contracting partners	0.28	1	-0.69	-1	-0.04	0	-0.14	0
Impact on the environment, sustainability	0.18	0	0.04	0	-0.01	0	-0.00	0
Learning opportunities for client organization	-0.95	-1	v-0.31	0	-0.51	-1	-0.63	-1
Personal growth and development	-1.05	-2	-0.77	-2	-0.78	-2	-1.59	-3
Profitability for contractor	-0.57	0	-2.03	-3	-1.58	-2	-1.48	-2
Project specific political or social factors	-1.37	-3	1.23	2	2.00	3	0.86	1
Quality	1.34	2	0.30	1	0.00	0	0.26	1
Right process followed	-1.07	-2	-0.23	0	0.37	1	-0.42	-1
Safety	1.91	3	-0.26	0	1.17	2	0.87	1
Satisfies needs of project team	-0.24	0	-0.77	-1	0.18	0	-0.59	-1
Satisfies needs of shareholders	0.04	0	0.69	1	-0.66	-1	0.98	1
Satisfies needs of stakeholders	-0.93	-1	-0.66	-1	-2.00	-3	1.70	2
Satisfies needs of users	1.05	1	0.90	1	0.52	1	0.14	0
Within budget	1.40	2	1.80	2	0.31	1	0.99	2

Appendix VII

Attribute list of Case I, II and III (Chapter 6 and 7)

Table VII-1 Attribute list of Case I

Id	Role	Position in project	Interview
1	project manager	D public project organization	yes
2	contract manager	D public project organization	yes
3	soil expert	D public project organization	yes
4	project manager	C private project organization	yes
5	stakeholder manager	C private project organization	yes
6	alderman	E public parent organization (commissioning)	no
7	construction permit authority	E public parent organization (commissioning)	no
8	enforcement officer fire brigade	G other public organization	no
9	enforcement officer police	G other public organization	no
10	soil permit authority	G other public organization	no
11	water permit authority	G other public organization	no
12	energy supplier	A other private organization	no
13	drinking water supplier	A other private organization	no
14	telecom supplier	A other private organization	no
15	telecom supplier	A other private organization	no
16	local entrepreneurs	A other private organization	no
17	business manager	B private parent organization	no
18	main contractor	C private project organization	no
19	construction supervisor	D public project organization	no
20	structural engineer	D public project organization	no
21	geotechnical consultant	D public project organization	no
22	Project leader initiative phase	D public project organization	no
23	constructive assessor	D public project organization	no
24	expert supply systems (cables and pipes)	D public project organization	no
25	executor	C private project organization	no
26	business manager	B private parent organization	no
27	sanitation specialist	A other private organization	no
28	sanitation specialist	C private project organization	no
29	safety engineer	C private project organization	no
30	assessor sanitation and safety	G other public organization	no
31	administrator public space	E public parent organization (commissioning)	no
32	residents	A other private organization	no
33	regional entrepreneurs	A other private organization	no
34	administrator rental properties	A other private organization	no
35	employee	C private project organization	no
36	employee	B private parent organization	no
37	design coordinator	C private project organization	no

Table VII-2 Attribute list of Case II

Id	Role	Position in project	Interview
1	project director	D public project organization	yes
2	project manager	D public project organization	yes
3	technical manager	D public project organization	yes
4	stakeholder manager	D public project organization	yes
5	manager finance and control	D public project organization	yes
6	manager electro mechanic installations	D public project organization	yes
7	project manager	C private project organization	yes
8	manager business office	C private project organization	yes
9	technical manager	C private project organization	yes
10	manager electro mechanic installations	C private project organization	yes
11	construction manager	C private project organization	yes
12	member of the installation team	D public project organization	no
13	supervisory board	D public project organization	no
14	execution manager	F public partner organization	no
15	member of the installation team	D public project organization	no
16	consultant	D public project organization	no
17	consultant	D public project organization	no
18	consultant	D public project organization	no
19	design manager	D public project organization	no
20	member of the installation team	D public project organization	no
21	member of the stakeholder team	D public project organization	no
22	assessor	D public project organization	no
23	member of the technical team	D public project organization	no
24	advisory board	D public project organization	no
25	contract manager	D public project organization	no
26	planner, member of the business office	D public project organization	no
27	financial administrator	D public project organization	no
28	HRM employee	D public project organization	no
29	communication manager	D public project organization	no
30	project leader execution phase	C private project organization	no
31	business manager	B private parent organization	no
32	safety officer	C private project organization	no
33	architect	C private project organization	no
34	manager drill process	C private project organization	no
35	architectural draftsman	C private project organization	no
36	contract manager	C private project organization	no
37	discipline leader (DL) constructive design	C private project organization	no
38	DL preparation installation works	C private project organization	no
39	DL preparation road constructive works	C private project organization	no
40	DL preparation constructive works	C private project organization	no
41	DL road construction design	C private project organization	no

Id	Role	Position in project	Interview
42	manager industrial safety	C private project organization	no
43	financial administrator	C private project organization	no
44	Project controller	C private project organization	no
45	Planner	C private project organization	no
46	risk manager	C private project organization	no
47	member of the installation team	C private project organization	no
48	member of the installation team	C private project organization	no
49	member of the installation team	C private project organization	no
50	license coordinator	C private project organization	no
51	employee, preparation of rail works	C private project organization	no
52	chairman of the board	B private parent organization	no
53	business manager	B private parent organization	no
54	director	B private parent organization	no
55	director safety department	G other public organization	no
56	employee safety department	G other public organization	no
57	employee, member of the ambulance staff	G other public organization	no
58	group of entrepreneurs	G other public organization	no
59	employee, member of the fire brigade	G other public organization	no
60	assessor of the fire brigade	G other public organization	no
61	employee, member of the fire brigade	G other public organization	no
62	supplier technical installations	A other private organization	no
63	representative of the municipality	F public partner organization	no
64	mayor	F public partner organization	no
65	coordinator licensing	F public partner organization	no
66	expert archeology	F public partner organization	no
67	alderman	F public partner organization	no
68	group of officials of the municipality	F public partner organization	no
69	group of land owners	A other private organization	no
70	national officials, advisors of the minister	F public partner organization	no
71	group of officials of the national government	F public partner organization	no
72	group of employees of several utilities	A other private organization	no
73	telecom representative	A other private organization	no
74	regional director of rail infrastructure	F public partner organization	no
75	employee of rail infra-owner	F public partner organization	no
76	representative of the province	E public parent organization (commissioning)	no
77	provincial executive	E public parent organization (commissioning)	no
78	expert archeology	E public parent organization (commissioning)	no
79	future owner	E public parent organization (commissioning)	no
80	provincial council	E public parent organization (commissioning)	no
81	accountant	A other private organization	no
82	regional director of national infrastructure	F public partner organization	no
83	district manager of national infrastructure	F public partner organization	no

Id	Role	Position in project	Interview
84	representative of public organization for national infrastructure organization	F public partner organization	no
85	representative of a project nearby with physical interfaces	F public partner organization	no
86	organized citizens with a special interest in cultural history	A other private organization	no
87	supplier technical installations	A other private organization	no
88	director of the water board	G other public organization	no
89	stakeholder manager	G other public organization	no
90	controller	F public partner organization	no
91	member of the future owner organization	F public partner organization	no
92	member of the future owner organization	F public partner organization	no
93	member of the future owner organization	F public partner organization	no
94	member of the future owner organization	F public partner organization	no
95	director of the future owner organization	F public partner organization	no
96	director of important cooperation in the project environment	A other private organization	no
97	special consultant	A other private organization	no
98	banker	A other private organization	no
99	insurer	A other private organization	no

Table VII-3 Attribute list of Case III

Id	Role	Position in project	Interview
1	project manager	D public project organization	yes
2	contract manager	D public project organization	yes
3	manager electro mechanic installations	D public project organization	yes
4	technical manager	D public project organization	yes
5	stakeholder manager	D public project organization	yes
6	project manager	C private project organization	yes
7	stakeholder manager	C private project organization	yes
8	manager project control	C private project organization	yes
9	manager electro mechanic installations	C private project organization	yes
10	project support	C private project organization	yes
11	contract manager	C private project organization	yes
12	manager project control	D public project organization	no
13	member of the contract team	D public project organization	no
14	member of the contract team	D public project organization	no
15	member of the contract team	D public project organization	no
16	member of the contract team	D public project organization	no
17	member of the contract team	D public project organization	no
18	member of the project control team	D public project organization	no
19	member of the project control team	D public project organization	no

Id	Role	Position in project	Interview
20	execution manager	C private project organization	no
21	coordinator specific technical project aspect	C private project organization	no
22	design manager	C private project organization	no
23	discipline leader road and construction	C private project organization	no
24	member of the technical team	C private project organization	no
25	member of the technical team	C private project organization	no
26	member of the technical team	C private project organization	no
27	member of the technical team	C private project organization	no
28	discipline leaders	C private project organization	no
29	senior advisor Quality Assurance	B private parent organization	no
30	senior advisor Legal Affairs	B private parent organization	no
31	director	B private parent organization	no
32	business manager	B private parent organization	no
33	representative of municipality D	G other public organization	no
34	alderman of municipality D	G other public organization	no
35	business manager	B private parent organization	no
36	chairman of the board	B private parent organization	no
37	business manager	B private parent organization	no
38	business manager	B private parent organization	no
39	representative of the regional water board	G other public organization	no
40	employee of the regional water board	G other public organization	no
41	employee of the regional water board	G other public organization	no
42	secretary of municipality A	G other public organization	no
43	alderman of municipality A	G other public organization	no
44	assessor health and safety of municipality A	G other public organization	no
45	representative of municipality A	G other public organization	no
46	employee safety department	G other public organization	no
47	employee safety department	G other public organization	no
48	national tunnel advisor	E public parent organization (commissioning)	no
49	team leader national tunnel instructions	E public parent organization (commissioning)	no
50	employee of the national safety department	E public parent organization (commissioning)	no
51	employee of the national tunnel safety department	E public parent organization (commissioning)	no
52	employee of the national tunnel instructions department	E public parent organization (commissioning)	no
53	advisor of the director of national infrastructure	E public parent organization (commissioning)	no
54	internal client	E public parent organization (commissioning)	no
55	department manager of technical installations	E public parent organization (commissioning)	no
56	strategic advisor	E public parent organization (commissioning)	no
57	assistant manager traffic control systems	E public parent organization (commissioning)	no

Id	Role	Position in project	Interview
58	representative of the future owner	E public parent organization (commissioning)	no
59	representative of the future owner	E public parent organization (commissioning)	no
60	representative of the future owner	E public parent organization (commissioning)	no
61	regional director of national infrastructure	E public parent organization (commissioning)	no
62	representative of municipality B	F public partner organization	no
63	mayor of municipality B	F public partner organization	no
64	director of department in municipality B	F public partner organization	no
65	coordinator safety municipality B	F public partner organization	no
66	alderman of municipality B	F public partner organization	no
67	project leader of local project with physical interfaces	F public partner organization	no
68	business manager	B private parent organization	no
69	business manager	B private parent organization	no
70	representative of municipality C	G other public organization	no
71	alderman of municipality C	G other public organization	no
72	process manager	C private project organization	no
73	coach	C private project organization	no
74	process manager	B private parent organization	no
75	coach	C private project organization	no
76	Process manager	D public project organization	no
77	director department of incident management	G other public organization	no
78	employee of the safety department	G other public organization	no
79	director of the province	G other public organization	no
80	expert / consultant	G other public organization	no
81	expert / consultant	G other public organization	no
82	expert / consultant	G other public organization	no
83	group of citizens	A other private organization	no
84	regional manager of the union	A other private organization	no
85	several claimants	A other private organization	no
86	insurance companies	A other private organization	no
87	corporate staff(s)	B private parent organization	no
88	corporate department(s)	B private parent organization	no
89	business manager	B private parent organization	no

Appendix VIII

Nodes in project organization context (Chapter 7)

Figure VIII-1 Nodes of Case II in project organization context
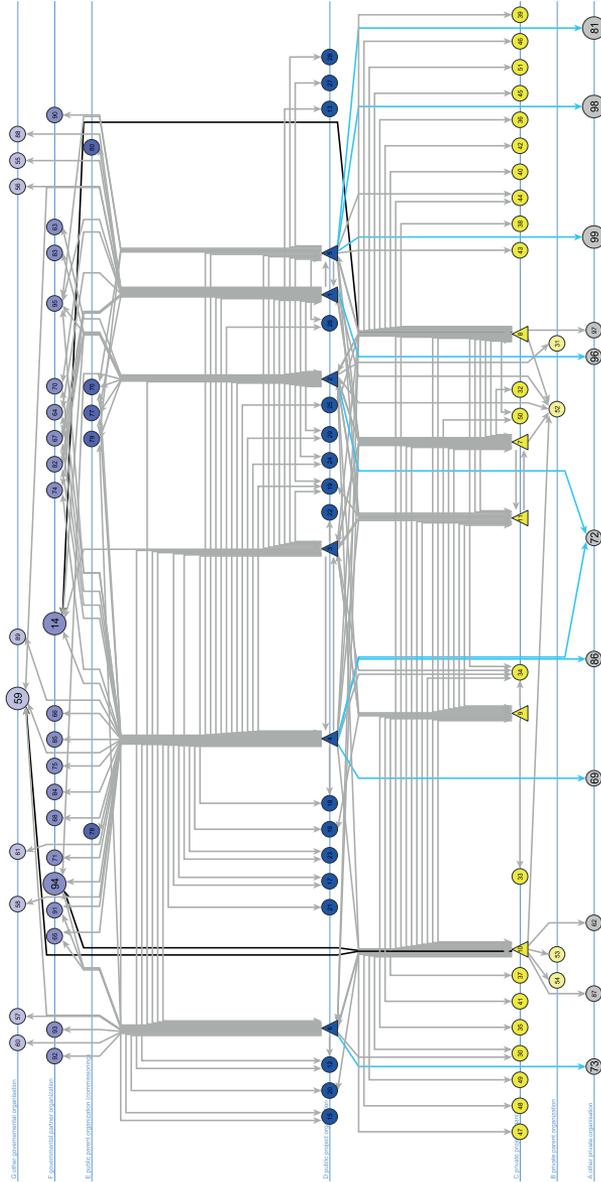
Figure VIII-2 Nodes of Case III in project organization context

Appendix IX

Questionnaires of the expert meeting (Chapter 8)
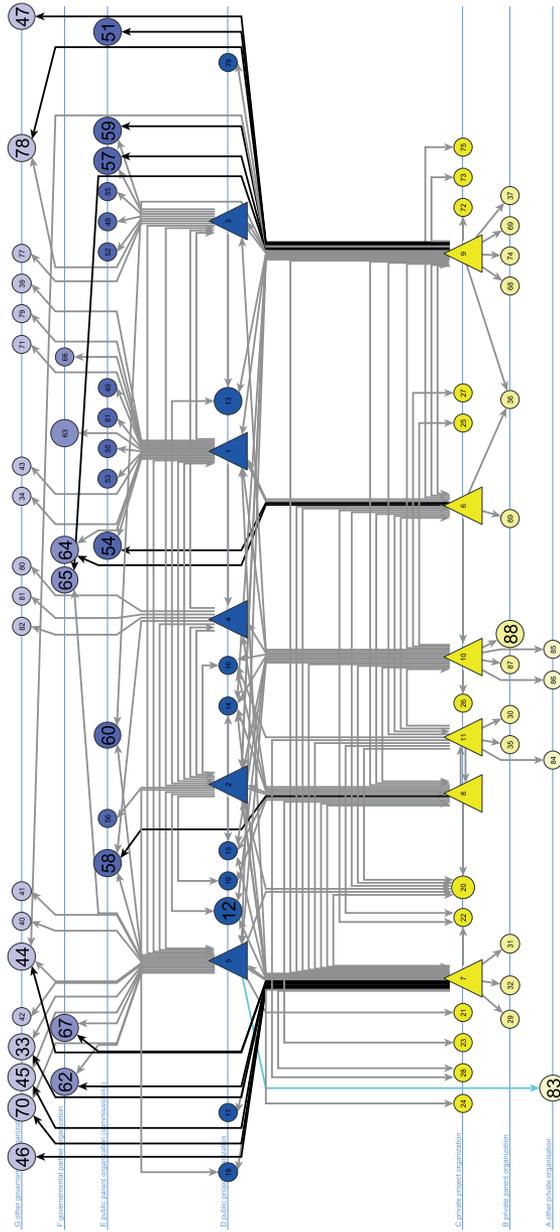
EXPERT-MEETING
Organisatie van publieke infrastructurele projecten.

Op 9 december neemt u deel aan de expert-meeting 'samenwerking in infrastructurele projecten' op de TUDelft. Deze expert-meeting maakt onderdeel uit van het onderzoek naar de invloed van de wijze waarop een infrastructureel project georganiseerd is op het resultaat dat geleverd wordt.

Voor dit onderzoek zijn diverse deelonderzoeken uitgevoerd. Met deze onderzoeken zijn specifieke onderdelen van de organisatie van infrastructurele projecten in kaart gebracht. Dit heeft geresulteerd in twee modellen en negen aanbevelingen voor een meer efficiënte en effectieve organisatie van publieke infrastructurele projecten.

In de expert-meeting willen we de resultaten toetsen. Daarvoor hanteren wij de volgende opzet:
- Voor aanvang vult iedere expert deze vragenlijst in.
- Op basis van de antwoorden bereiden wij de discussie voor. De antwoorden worden anoniem behandeld.
- Tijdens de bijeenkomst faciliteren wij het gesprek tussen de experts.
- Na de discussie vragen wij om uw individuele feedback.

Het invullen van deze vragenlijst kost 20-30 minuten.

Hartelijk dank voor uw medewerking aan het onderzoek.

Leonie Koops
doctoraal kandidaat

Begeleiding
- dr.ir. M.G.C. Bosch-Rekveldt
- prof. dr. H.L.M. Bakker
- prof. dr. ir. M.J.C.M. Hertogh

INTRODUCTIE

In Nederland worden infrastructurele projecten geïnitieerd door de lokale, regionale of nationale overheid. Voor de uitvoering van de projecten worden private partijen gecontracteerd.

Onderstaand model geeft de betrokken partijen weer, met de begrippen die in dit onderzoek gehanteerd worden.
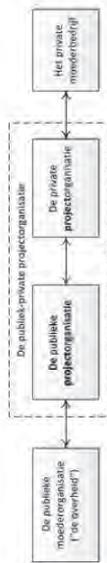
De vragenlijst is onderverdeeld in een aantal onderdelen:

1. De kenmerken van de organisatie van een infrastructureel project;
2. De interne processen in een publieke projectorganisatie;
3. De externe processen van een projectorganisatie onderverdeeld in:
   - het grensvlak met de moederorganisaties;
   - het grensvlak met de partner projectorganisatie;
4. Vragen over uw achtergrond en ervaring.

U bent benaderd om vanuit uw rol als [Inqroll] bij een [Inqtypeorg] deel te nemen aan de expert-meeting.
Wij verzoeken u de vragenlijst vanuit dit perspectief in te vullen.

DE KENMERKEN VAN EEN PROJECTORGANISATIE

Voor het uitvoeren van een infrastructureel project wordt vanaf de opdrachtverlening tot aan de oplevering een projectorganisatie gevormd. Aan de publieke kant wordt na interne opdrachtverlening een projectorganisatie gevormd. Ook de private partij, die opdracht krijgt van de publieke organisatie, vormt een projectorganisatie. De bemensing is afhankelijk van de grootte van de opdracht en de fase waarin het project zich bevindt. De verdeling van de uit te voeren werkzaamheden tussen publieke en private projectorganisatie is afhankelijk van de contractvorm.

In deze vragenlijst worden deze projectorganisaties expliciet aangeduid met 'publieke projectorganisatie' en 'private projectorganisatie'. Daar waar niet explicit 'publiek' of 'privaat' wordt vermeld, wordt u gevraagd naar uw mening voor de projectorganisatie waar u die meest directe relatie mee heeft. Afhankelijk van uw eigen positie kan dat dus de publieke of private projectorganisatie zijn.
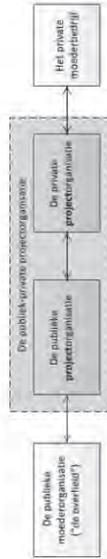
De eerste vragen (vraag 1 t/m 6) gaan over de kenmerken van **een projectorganisatie voor een infrastructureel project.**

Afhankelijk van uw eigen positie is dit dus de 'publieke projectorganisatie' of de 'private projectorganisatie'. Beschouw de projectorganisatie vanuit uw rol als [Inqroll] bij een [Inqtypeorg].

1. Wat is de gemiddelde duur van het moment dat uw organisatie(onderdeel) de projectopdracht krijgt, tot de het moment waarop uw organisatie het project afsluit of overdraagt?

☐ Korter dan een jaar
☐ 1 tot 2 jaar
☐ 2 tot 5 jaar
☐ 5 tot 10 jaar
☐ Langer dan 10 jaar.

ACTIVITEITEN IN DE PROJECTORGANISATIE

Om een project uit te voeren worden in de publieke en private projectorganisaties activiteiten uitgevoerd. De activiteiten in beide organisaties zijn gericht op het bereiken van hetzelfde projectresultaat, maar de bijdragen aan het eindresultaat zijn verschillend.
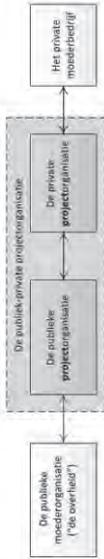
In een (project)organisatie worden vele activiteiten uitgevoerd in diverse processen. In dit onderzoek is voor organisatorische processen aansluiting gezocht bij de bedrijfsprocessen zoals door Michael Porter, professor aan Harvard Business School, in beeld is gebracht in de zogenaamde 'value chain' van activiteiten (Porter, 1980) die gezamenlijk waarde toevoegen voor het bedrijf. Daarbij wordt door Porter onderscheid gemaakt in kernactiviteiten (primaire activiteiten) en ondersteunende activiteiten.

kernactiviteit
Een kernactiviteit is een activiteit die direct bijdraagt aan het resultaat van de organisatie. Kernactiviteiten vormen de primaire processen van de organisatie.

ondersteunende activiteit
Een ondersteunende activiteit is een activiteit die indirect bijdraagt aan het resultaat van de organisatie, veelal door ondersteuning te bieden aan de kernactiviteiten. Ondersteunende activiteiten vormen niet de primaire processen, maar beïnvloeden de kwaliteit van de primaire processen.

De onderstaande figuur illustreert de waardeketen van commerciële productiebedrijven volgens Porter.

Figuur 1, Value Chain Model, M. Porter, 1980

De volgende vragen gaan over activiteiten in infrastructurele projectorganisaties en de mate waarin deze, naar uw mening als [Ingroll], tot de primaire of secundaire activiteiten van de publieke of private projectorganisatie behoren.

De volgende vragen zijn gescheiden in vragen over alle medewerkers in de projectorganisatie (vraag 2 en 3) en vragen specifiek over de medewerkers met een leidinggevende rol in de projectorganisatie, vaak aangeduid met termen als 'kernteam', 'IPM-team' of 'projectmanagementteam' (vraag 4 en 5).

2. Hoe lang zijn de **projectmedewerkers** werkzaam bij het project? (in de meeste gevallen)

☐ enkele dagen (tot ca. 4 weken)
☐ enkele weken (tot ca. 4 maanden)
☐ enkele maanden (tot ca. 10 maanden)
☐ circa 1 tot 1,5 jaar
☐ meerdere jaren

3. Welk deel van hun beschikbare tijd zijn de **projectmedewerkers** verbonden aan het project?

☐ fulltime (1,0 fte)
☐ circa 80% (0,8 fte)
☐ circa circa 50-60% (tot 0,6 fte)
☐ circa 25% (tot 0,4 fte)
☐ incidenteel bij het project betrokken

4. Hoe lang zijn de **kernteamleden** werkzaam bij het project?

☐ enkele dagen (tot ca. 4 weken)
☐ enkele weken (tot ca. 4 maanden)
☐ enkele maanden (tot ca. 10 maanden)
☐ circa 1 tot 1,5 jaar
☐ meerdere jaren

5. Welk deel van hun beschikbare tijd zijn de **kernteamleden** verbonden aan het project?

☐ fulltime (1,0 fte)
☐ circa 80% (0,8 fte)
☐ circa 50-60% (tot 0,6 fte)
☐ circa 25% (tot 0,4 fte)
☐ incidenteel aan het project

6. Het type werkzaamheden dat in een projectteam wordt verricht, is:

☐ voor het merendeel uniek (80-100%) en voor een klein deel routinematig (0-20%).
☐ met name uniek (60-80%) en gedeeltelijk routinematig (20-40%).
☐ ongeveer gelijk verdeeld (50-50%) tussen unieke en routinematige werkzaamheden.
☐ voor een groot deel routinematig (60-80%), met enkele unieke elementen (20-40%).
☐ voor het merendeel routinematig (80-100%) en voor een klein deel uniek (0-20%).

7. Over welke **kwaliteiten** moet de projectorganisatie beschikken?

	niet nodig	enigszins nodig	nodig	in hoge mate nodig	noodzakelijk
Flexibel	☐	☐	☐	☐	☐
Stabiel	☐	☐	☐	☐	☐
Alusnr	☐	☐	☐	☐	☐
Voorspelbaar	☐	☐	☐	☐	☐

8. Deze vraag gaat over activiteiten in de publieke projectorganisatie (zie onderstaand figuur).

De publieke moederorganisatie ("de overheid") → De publiek-private projectorganisatie [De publieke projectorganisatie ↔ De private projectorganisatie] → Het private moederbedrijf
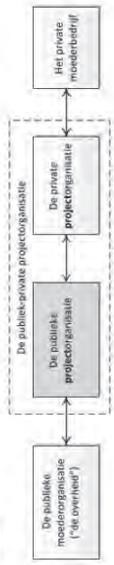
Tot welk type activiteit rekent u de onderstaande werkzaamheden van een **publieke** projectorganisatie?

	kernactiviteit	ondersteunende activiteit	geen projectactiviteit
a. verkrijgen (van vergunning(en))	☐	☐	☐
b. verificatie en validatie van eisen	☐	☐	☐
c. testen en opleveren	☐	☐	☐
d. scopemanagement	☐	☐	☐
e. risicomanagement	☐	☐	☐
f. realiseren / bouwen	☐	☐	☐
g. procesontwerp en begeleiding	☐	☐	☐
h. planningsmanagement	☐	☐	☐
i. personeelsmanagement	☐	☐	☐
j. ontwerpen en engineering	☐	☐	☐
k. organiseren van besluitvorming	☐	☐	☐
l. omgevingsmanagement	☐	☐	☐
m. kwaliteitsmanagement	☐	☐	☐
n. kennis- en ontwikkelmanagement	☐	☐	☐
o. inkoop en contractbeheer	☐	☐	☐
p. informatie management	☐	☐	☐
q. implementeren van het resultaat	☐	☐	☐
r. financieel management	☐	☐	☐
s. conditionerende werkzaamheden	☐	☐	☐

9. Indien u nog kernactiviteiten mist die de publieke projectorganisatie uitvoert, wilt u deze dan hieronder aangeven.

10. Indien u nog ondersteunende activiteiten mist die de publieke projectorganisatie uitvoert, wilt u deze dan hieronder aangeven.

11. De volgende stellingen omschrijven diverse elementen uit het functioneren van een publieke projectorganisatie.

De publieke moederorganisatie ("de overheid") → De publiek-private projectorganisatie [De publieke projectorganisatie ↔ De private projectorganisatie] → Het private moederbedrijf
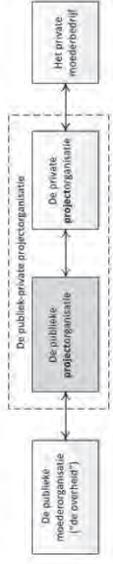
In welke mate geven de onderstaande stellingen **de huidige werkwijze** in projecten weer naar uw mening?

	volledig mee oneens	enigszins mee oneens	enigszins mee eens	volledig mee eens	geen mening
a. Een publieke projectorganisatie heeft een duidelijke, transparante relatie met de publieke moederorganisatie.	☐	☐	☐	☐	☐
b. Een publieke projectorganisatie kan volledig autonoom opereren.	☐	☐	☐	☐	☐
c. Een publieke projectorganisatie is verantwoordelijk voor het beheerst uitvoeren van scope-drift. Dat wil zeggen het beperkt muteren van scope en kaders van tijd en geld om het projectdoel te kunnen bereiken en/of vervullen.	☐	☐	☐	☐	☐
d. Een publieke projectorganisatie is verantwoordelijk voor het kennen van en handelen naar de juiste procedures.	☐	☐	☐	☐	☐
e. Een publieke projectorganisatie mag geen relatie hebben met de vergunningverlenende afdelingen bij de eigen moederorganisatie en/of andere overheden.	☐	☐	☐	☐	☐
f. In een publieke projectorganisatie is de **rechtmatigheid** van handelingen belangrijker dan **de doelmatigheid** van oplossingen ("fit for purpose").	☐	☐	☐	☐	☐

12. Deze vraag gaat over activiteiten in de private projectorganisatie (zie onderstaand figuur).
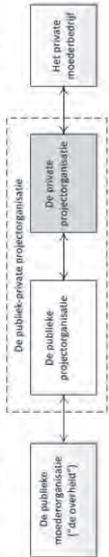
Tot welk type activiteit rekent u de onderstaande werkzaamheden van een **private** projectorganisatie?

	kernactiviteit	ondersteunende activiteit	geen projectactiviteit
a. verkrijgen van vergunning(en)	☐	☐	☐
b. verificatie en validatie van eisen	☐	☐	☐
c. testen en opleveren	☐	☐	☐
d. scopemanagement	☐	☐	☐
e. riscomanagement	☐	☐	☐
f. realiseren / bouwen	☐	☐	☐
g. procesontwerp en begeleiding	☐	☐	☐
h. planningsmanagement	☐	☐	☐
i. personeelsmanagement	☐	☐	☐
j. ontwerpen en engineering	☐	☐	☐
k. organiseren van bestuursvorming	☐	☐	☐
l. omgevingsmanagement	☐	☐	☐
m. kwaliteitsmanagement	☐	☐	☐
n. kennis- en ontwikkelmanagement	☐	☐	☐
o. Rinkoop en contractbeheer	☐	☐	☐
p. informatie management	☐	☐	☐
q. implementaren van het resultaat	☐	☐	☐
r. financieel management	☐	☐	☐
s. conditionerende werkzaamheden	☐	☐	☐

13. Indien u nog kernactiviteiten mist die de private projectorganisatie uitvoert, wilt u deze dan hieronder aangeven.

14. Indien u nog ondersteunende activiteiten mist die de private projectorganisatie uitvoert, wilt u deze dan hieronder aangeven.

15. De volgende stellingen omschrijven diverse elementen uit het functioneren van een private projectorganisatie.
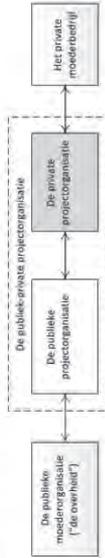
In welke mate geven de onderstaande stellingen **de huidige situatie** in projecten weer naar uw mening?

	volledig mee oneens	enigszins mee oneens	enigszins mee eens	volledig mee eens	geen mening
a. Een private projectorganisatie heeft een duidelijke, transparante relatie met de eigen moederorganisatie.	☐	☐	☐	☐	☐
b. Een private projectorganisatie kan volledig autonoom opereren.	☐	☐	☐	☐	☐
c. Een private projectorganisatie is verantwoordelijk voor het beheerst uitvoeren van scope-drift. Dat wil zeggen het beperkt muteren van scope en kaders van tijd en geld om het projectdoel te kunnen bereiken en/of vervullen.	☐	☐	☐	☐	☐
d. Een private projectorganisatie is verantwoordelijk voor het kennen van en handelen naar de juiste procedures.	☐	☐	☐	☐	☐
e. In een private projectorganisatie is de **doelmatigheid** van oplossingen (fit for purpose) i.p.v. de **rechtmatigheid** van handelingen.	☐	☐	☐	☐	☐

EXTERNE PROCESSEN

Interactie met de publieke moederorganisatie

De publieke projectorganisatie voor een infrastructureel project wordt gevormd vanuit een moederorganisatie, bijvoorbeeld een gemeente, provincie of Rijkswaterstaat. In sommige projecten zijn meerdere publieke organisaties betrokken die via een bestuurlijk akkoord gezamenlijk opdrachtgever voor een publiek project zijn. Eén van de partners treedt dan op als 'penvoerder' of primair contact naar de projectorganisatie.

De publiek-private projectorganisatie

De publieke moederorganisatie ("de overheid") → De publieke projectorganisatie ↔ De private projectorganisatie → Het private moederbedrijf
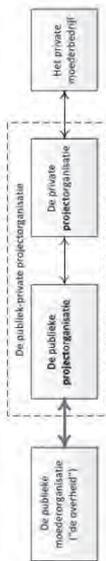
De volgende vragen gaan over het snijvlak tussen de publieke moederorganisatie en de publieke projectorganisatie. Als u niet zelf werkzaam bent op dit snijvlak, kunt u invullen hoe u de interactie op dit snijvlak ervaart vanuit uw rol.

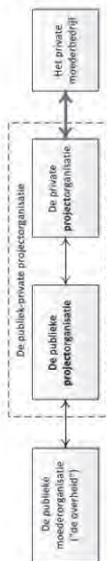16. In welke mate duiden de volgende begrippen de activiteiten van een publieke projectorganisatie in de **interactie met de publieke moederorganisatie?**

	geenzins van toepassing	in enige mate van toepassing	volledig van toepassing
a. afgestemd houden van doelen	☐	☐	☐
b. afstemmen van besluiten	☐	☐	☐
c. afstemmen van processen	☐	☐	☐
d. afstemmen van trade-off matrices	☐	☐	☐
e. controleren van de haalbaarheid	☐	☐	☐
f. garanderen rechtmatigheid	☐	☐	☐
g. (tussentijds) goedkeuren van producten	☐	☐	☐
h. inbrengen van kennis	☐	☐	☐
i. informeren over risico's	☐	☐	☐
j. onderzoeken van mogelijkheden (niet standaard oplossingen)	☐	☐	☐
k. ontwikkelen van kennis	☐	☐	☐
l. prioriteren van doelen	☐	☐	☐
m. kennen van de regelgeving	☐	☐	☐
n. verantwoorden gerealiseerde winst	☐	☐	☐
o. verantwoorden bestedingen	☐	☐	☐
p. verantwoorden van resultaten	☐	☐	☐
q. valideren van de resultaten	☐	☐	☐
r. zorgen voor capaciteit (mensen)	☐	☐	☐
s. zorgen voor machinerie	☐	☐	☐
t. zorgen voor materialen	☐	☐	☐

EXTERNE PROCESSEN

Interactie tussen de publieke en private projectorganisatie

Op een zeker moment zoekt de publieke projectorganisatie een private partner voor het uitvoeren van een deel van de projectactiviteiten. De private projectorganisatie voert zijn activiteiten uit ten behoeve van het publieke project, in opdracht van de publieke projectorganisatie. De uitgevraagde activiteiten verschillen per contract(vorm). Een veel voorkomende contractvorm is Design&Construct (onder de UAV-gc). Indien bij de beantwoording van de vragen in uw ogen de contractvorm een rol speelt, kiest u dan voor het antwoord dat van toepassing is op D&C-contractrelaties.

De publiek-private projectorganisatie

De publieke moederorganisatie ("de overheid") → De publieke projectorganisatie ↔ De private projectorganisatie → Het private moederbedrijf

De volgende vragen gaan over het snijvlak tussen de publieke projectorganisatie en de private projectorganisatie. Als u niet zelf werkzaam bent op dit snijvlak, wilt u dan invullen hoe u de interactie op dit snijvlak ervaart vanuit uw positie.

17. In welke mate duiden de volgende begrippen de activiteiten van een publieke projectorganisatie in de **interactie met de projectorganisatie van de private partner?**

	geenzins van toepassing	in enige mate van toepassing	volledig van toepassing
a. afgestemd houden van doelen	☐	☐	☐
b. afstemmen van besluiten	☐	☐	☐
c. afstemmen van processen	☐	☐	☐
d. afstemmen van trade-off matrices	☐	☐	☐
e. controleren van de haalbaarheid	☐	☐	☐
f. garanderen rechtmatigheid	☐	☐	☐
g. (tussentijds) goedkeuren van producten	☐	☐	☐
h. inbrengen van kennis	☐	☐	☐
i. informeren over risico's	☐	☐	☐
j. onderzoeken van mogelijkheden (niet standaard oplossingen)	☐	☐	☐
k. ontwikkelen van kennis	☐	☐	☐
l. prioriteren van doelen	☐	☐	☐
m. kennen van de regelgeving	☐	☐	☐
n. verantwoorden gerealiseerde winst	☐	☐	☐
o. verantwoorden bestedingen	☐	☐	☐
p. verantwoorden van resultaten	☐	☐	☐
q. valideren van de resultaten	☐	☐	☐
r. zorgen voor capaciteit (mensen)	☐	☐	☐
s. zorgen voor machinerie	☐	☐	☐
t. zorgen voor materialen	☐	☐	☐

EXTERNE PROCESSEN

Interactie met de private moederorganisatie

Ook de private projectorganisatie wordt gevormd vanuit een moederorganisatie. Bij grote projecten vindt vaak ook nog consortiumvorming plaats waardoor de private projectorganisatie wordt gevormd vanuit meerdere moederorganisaties.

De volgende vragen gaan over het snijvlak tussen de private projectorganisatie en de private moederorganisatie. Als u niet zelf werkzaam bent op dit snijvlak, wilt u dan invullen hoe u de interactie op dit snijvlak ervaart vanuit uw positie.

```
De publieke                 De publiek-private projectorganisatie
moederorganisatie       ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
("de overheid")         │                                │
    │                   │  De publieke    De private     │    Het private
    └───────────────────┼─ projectorganisatie ◄──► projectorganisatie ─┼──── moederbedrijf
                        │                                │
                        └ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
```

18. In welke mate duiden de volgende begrippen de activiteiten van een private projectorganisatie in de interactie met de **eigen moederorganisatie**?

	geenszins van toepassing	in enige mate van toepassing	volledig van toepassing
a. afgestemd houden van doelen	☐	☐	☐
b. afstemmen van besluiten	☐	☐	☐
c. afstemmen van processen	☐	☐	☐
d. afstemmen van trade-off matrices	☐	☐	☐
e. controleren van de haalbaarheid	☐	☐	☐
f. garanderen rechtmatigheid	☐	☐	☐
g. (tussentijds) goedkeuren van producten	☐	☐	☐
h. inbrengen van kennis	☐	☐	☐
i. informeren over risico's	☐	☐	☐
j. onderzoeken van mogelijkheden (niet standaard oplossingen)	☐	☐	☐
k. ontwikkelen van kennis	☐	☐	☐
l. prioriteren van doelen	☐	☐	☐
m. kennis van de regelgeving	☐	☐	☐
n. verantwoorden gerealiseerde winst	☐	☐	☐
o. verantwoorden bestedingen	☐	☐	☐
p. verantwoorden van resultaten	☐	☐	☐
q. valideren van de resultaten	☐	☐	☐
r. zorgen voor capaciteit (mensen)	☐	☐	☐
s. zorgen voor machineria	☐	☐	☐
t. zorgen voor materialen	☐	☐	☐

TOT SLOT...

Dit waren de vragen over de organisatie van infrastructurele projecten en de werkzaamheden die nodig zijn om infrastructuur te kunnen realiseren. Tenslotte volgen nog enkele vragen over uw persoonlijke achtergrond.

19. Welke opleiding(en) heeft u voltooid?

☐ Civiele Techniek / Weg- en waterbouwkunde (WO)
☐ Civiele Techniek / Weg- en waterbouwkunde (HBO)
☐ Andere technische opleiding (WO)
☐ Andere technische opleiding (HBO)
☐ Niet technische universitaire opleiding
☐ Anders

20. Hoeveel jaar ervaring heeft u met infrastructurele projecten?

☐ 0-5 jaar
☐ 5-10 jaar
☐ 10-15 jaar
☐ meer dan 15 jaar

21. Heeft u ervaring met het werken in projecten in andere branches dan de civiele techniek?

☐ nee
☐ ja

EINDE

U bent gekomen aan het einde van deze vragenlijst. Hartelijk dank voor het invullen van de vragen.

EXPERT-MEETING
Organisatie van publieke
infrastructurele projecten.

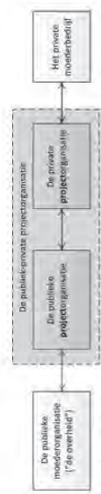**ᵀU**Delft

Vragenlijst na expert-meeting

Hoofdsectie

NASCHRIFT

Enkele weken geleden heeft u als [Ingrol)] deelgenomen aan een van de expertmeetings over de organisatie van p infrastructurele projecten. Tijdens deze sessie zijn twee modellen en diverse aanbevelingen gepresenteerd en bediscussieerd. Op basis van de respons in de expertmeetings zijn de aanbevelingen aangescherpt.

In deze afsluitende vragenlijst vragen wij uw individuele feedback op de definitieve aanbevelingen.

Aanbeveling 1

Richt na contracteren gezamenlijk de samengestelde projectorganisatie in voor een efficiënte en effectieve productie. Besteed hierbij expliciet aandacht aan de inrichting van de waardeketen.

De waardeketen bestaat uit primaire en secundaire processen. Voor het inrichten van beiden geldt:
1. Maak de verschillen in de bijdragen en verantwoordelijkheden vanuit het publieke en private deel expliciet.
2. Zorg voor een gezamenlijk beeld van de interactie en de samenhang in de werkprocessen richting het doel.

Primaire processen in de samengestelde projectorganisatie zijn:
- Legaliseren   (publieke regie, private bijdrage)
- Voorbereiden   (publieke regie, private bijdrage)
- Ontwerpen en verifiëren van eisen (publiek-privaat gezamenlijk)
- Bouwen en verifiëren van eisen (private taak)
- Overdragen   (publiek- privaat gezamenlijk)

Ondersteunende processen in de samengestelde projectorganisatie zijn:
- Projectbeheersing, inclusief contractbeheer en scopemanagement (publieke taak)
- Procesontwerp besluitvorming   (publieke regie, private bijdrage)
- Stakeholdermanagement, inclusief validatie van eisen   (publieke regie, private bijdrage)

In de onderstaande figuur is de waardeketen van het publiek-private productieproces weergegeven.
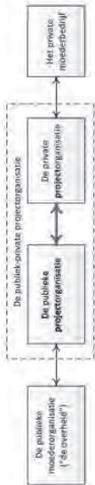

Figuur 2 Waardeketen van de gezamenlijke projectorganisatie

1. Draagt deze aanbeveling bij aan het verbeteren van de prestatie van de gezamenlijke projectorganisatie? Oftewel wordt hiermee de kans op projectsucces vergroot?

○ Ja
○ Nee

2. Welke overwegingen wilt u hierbij nog meegeven?

Inleiding

Na contracteren moeten de publieke projectorganisatie en de private projectorganisatie samenwerken om het projectresultaat te realiseren. De eerste aanbevelingen gaan over het inrichten van het raakvlak tussen de twee projectorganisaties zodat deze beter op elkaar aansluiten waardoor minder verlies ontstaat. De focus in de besturing van d gezamenlijke projectorganisatie (figuur 1) verschuift daarmee van het publiek-private raakvlak naar de raakvlakken met d moederorganisaties.

Figuur 1 De gezamenlijke projectorganisatie

Aanbeveling 2

Breng per asset gezamenlijk de workflow om te komen tot besluitvorming door de asset-owner in beeld. Deel kennis en informatie om maatgevende besluiten te onderbouwen.
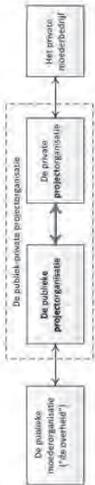
De publiek-private projectorganisatie

De publieke moederorganisatie ("de overheid") — De publieke projectorganisatie ↔ De private projectorganisatie → Het private moederbedrijf

3. Kunt u met aanbeveling 2 de efficiëntie en effectiviteit van uw projectorganisatie verbeteren?

○ Ja
○ Nee

4. Wat zijn eventuele knelpunten?

Aanbeveling 3

Acteer vanaf start van de samengestelde projectorganisatie gezamenlijk in de projectomgeving. Valideer bij aanvang van het productieproces gezamenlijk het (aanbiedings)ontwerp.

De publiek-private projectorganisatie

De publieke moederorganisatie ("de overheid") — De publieke projectorganisatie ↔ De private projectorganisatie → Het private moederbedrijf
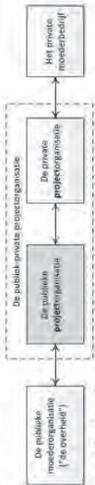
5. Draagt aanbeveling 3 bij aan het verhogen van de efficiëntie en effectiviteit van de publiek-private projectorganisatie?

○ Ja
○ Nee

6. Wat zijn eventuele knelpunten?

De publieke projectorganisatie

De volgende aanbevelingen gaan specifiek over de invulling van de rol van het publieke deel van de gezamenlijke projectorganisatie.

De publiek-private projectorganisatie

De publieke moederorganisatie ("de overheid") — De publieke projectorganisatie ↔ De private projectorganisatie → Het private moederbedrijf

Aanbeveling 4

Wees transparant over de eigen rol in de publieke context richting de private partner. Maak daarbij expliciet onderscheid in de rollen die er vanuit de moederorganisatie (en partnerorganisaties) zijn, met name in de rol van de moederorganisatie als vergunningverlener, de rol van de moederorganisatie als asset-eigenaar (de beheerder) en de rol van de moederorganisatie als opdrachtgever.
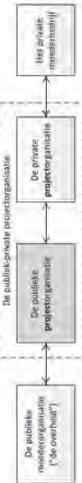
7. Draagt aanbeveling 4 bij aan het verhogen van de effectiviteit van de publiek-private projectorganisatie?

○ Ja
○ Nee

8. Welke overwegingen wilt u hierbij nog meegeven?

Aanbeveling 5

Maak expliciet onderscheid tussen projectmanagementsucces en productsucces. Communiceer en rapporteer separaat, maar gelijktijdig en in gelijke mate over technisch inhoudelijke voortgang en risico's en procesmatige voortgang en risico's. Zorg voor balans tussen creëren en controleren.

De publiek-private projectorganisatie

De publieke moederorganisatie ("de overheid") — De publieke projectorganisatie ↔ De private projectorganisatie → Het private moederbedrijf

9. Draagt aanbeveling 5 bij aan het verhogen van de efficiëntie en effectiviteit van de publiek-private projectorganisatie?

○ Ja
○ Nee

10. Welke knelpunten ziet u hierbij?

De publieke en private moederorganisatie

Door accentverschuivingen in de rolverdeling kunnen zowel de moederorganisaties als de projectorganisatie profiteren. De volgende aanbevelingen zijn geformuleerd ter verbetering van de interactie op de raakvlakken met de moederorganisaties.

De publiek-private projectorganisatie

De publieke moederorganisatie ("de overheid") — De publieke projectorganisatie ↔ De private projectorganisatie → Het private moederbedrijf

Aanbeveling 6

Zoek op het gebied van personeelsmanagement vanuit de moederorganisatie proactief aansluiting bij de projectorganisatie voor het vormgeven van ontwikkeltrajecten van medewerkers.
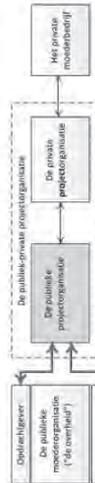
11. Draagt aanbeveling 6 bij aan het verhogen van de effectiviteit van de publiek-private projectorganisatie?

○ Ja
○ Nee

12. Welke overwegingen wilt u hierbij nog meegeven?

Aanbeveling 7, voor de publieke moederorganisatie

Zet de publieke projectorganisatie op duidelijke afstand van de vergunningverlenende rol om belangenverstrengeling te voorkomen. Zorg zo dat de publieke projectorganisatie haar netwerk en kennis actief kan inzetten in procedures.

De publiek-private projectorganisatie

Opdrachtgever — De publieke moederorganisatie ("de overheid") — De publieke projectorganisatie ↔ De private projectorganisatie → Het private moederbedrijf
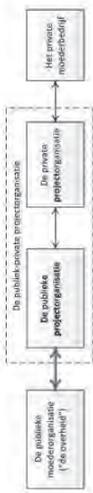Vergunningverlener

13. Draagt aanbeveling 7 bij aan het verhogen van de effectiviteit van de publiek-private projectorganisatie?

○ Ja
○ Nee

Aanbeveling 8, voor de publieke moederorganisatie

Organiseer een projectoverschrijdende meerjarenagenda met asset-eigenaren die met meerdere projecten in aanraking gaan komen.
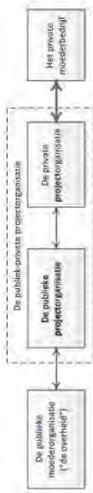

15. Draagt aanbeveling 8 bij aan het verhogen van de prestatie van de publiek-private projectorganisatie?

○ Ja
○ Nee

16. Welke uitdagingen ziet u hierbij?

_____

Aanbeveling 9, voor de private moederorganisatie

Zorg voor een duidelijke vertegenwoordiger van de private moederorganisatie in het project, ook zichtbaar en aanspreekbaar voor de publieke partner.

17. Denkt u dat aanbeveling 9 een positieve invloed heeft op de prestatie van de publiek-private projectorganisatie?

○ Ja
○ Nee

18. Welke overwegingen wilt u hierbij nog meegeven?

_____

U bent gekomen aan het einde van deze vragenlijst.

Hartelijk dank voor uw deelname aan de expert-meeting en het invullen van de vragenlijsten.

Dankwoord (Acknowledgements in Dutch)

Nu is dan echt dit project afgerond, de planning gaat niet verder, de mijlpaal is gehaald! Of het helemaal binnen tijd en budget is gelukt, is voor mij niet relevant. De toegevoegde waarde voor mijzelf is overduidelijk de rijkdom aan mensen die ik heb leren kennen en die mij hebben geholpen in dit project. Zonder hen was er geen project geweest en ik ben hen daarom veel dank verschuldigd. Een aantal van hen wil ik speciaal bedanken.

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Daarnaast ben ik veel dank verschuldigd aan mijn tweede promotor prof.dr.ir. M.J.C.M. Hertogh. Beste Marcel, hoewel ik dit project bewust niet bij 'mijn eigen' faculteit Civiele Techniek ben begonnen, ben ik daar met veel plezier weer thuis gekomen. Jouw komst naar de TUDelft en onze aansluiting bij de sectie was voor mij welkome 'scope-change'. Ik heb genoten van de onverwachte wijze waarop je vragen stelde en opmerkingen plaatste, altijd kritisch en opbouwend. Jouw toevoegingen hebben dit project absoluut méér waarde gegeven.

En dan natuurlijk mijn co-promotor dr.ir. M.G. Bosch-Rekveldt. Beste Marian, jij bent ongetwijfeld de belangrijkste succesfactor in dit project! Het begon op operationeel niveau, als gezellige sparringpartner om ervaringen te delen. Toen je na je eigen promotie naar tactisch niveau opschoof, kreeg ik eindelijk een gevoel van control in dit project. Ik heb eindeloos respect voor alle ballen die jij hoog weet te houden. Dank dat je mijn project daar ook nog aan toe wilde voegen, jouw eerste promovenda. Er volgen er ongetwijfeld nog velen!

Daarnaast gaat mijn dank gaat uit naar het NAP Netwerk en de Stichting Bakker-Arts voor hun ondersteuning van het drukken van het proefschrift. Tevens ben ik veel dank verschuldigd aan allen die hebben deelgenomen aan dit onderzoek: de projectmanagers die inzicht gaven in hun succesperceptie, de managers die hun project en projectteam openstelden, de deelnemers aan de expertsessie. Overal waar ik informeerde of ik mocht vastleggen hoe mensen in projecten dagelijks proberen het goede te doen, werd er snel positief gereageerd. Leren van project naar project is nog onderwerp van (wetenschappelijk) onderzoek, maar ik weet zeker dat het aan de attitude van deze mensen niet zal liggen. De openheid en eerlijkheid waarmee informatie is gedeeld, heeft in belangrijke mate bijgedragen aan het succes van dit project.

Dank aan mijn teamgenoten uit de sectie: Ellen, Prap, Afshin, Erfan, Maedeh, Jules, Leon en natuurlijk Sandra voor de gezelligheid, discussies en inspirerende gesprekken. Ook Liselore, Steffen en Albert van de editorial committee van DNRG dank voor de leuke meetings waarin jullie mij hele andere aspecten van Project Management leerden. En niet te vergeten de afstudeerders die ik heb mogen begeleiden, in het bijzonder Ceciel en Laura. Hun zoektocht voor de eigen Masterthesis riep bij mij altijd nieuwe gedachten op waarmee ik mijn onderzoek verder vorm kon geven.

Hoewel ik dit project parallel aan mijn werk bij Witteveen+Bos heb uitgevoerd, ben ik mijn collega's bij Witteveen+Bos dankbaar voor het begrip dat ze altijd toonden voor mijn beperkte beschikbaarheid op de vrijdagen, voor de positieve reacties als ik mijn inspiratie deelde (PM meets Science) en voor het geduld dat zij toonden als ik mijn 'hobby' teveel naar het werk bracht. Dat geldt zeker voor mijn teamgenoten in de projecten, waarbij ik de projectorganisaties van De Centrale As, Haak om Leeuwarden, A9Amstelveen (later A9Badhoevedorp-Holendrecht) en combinatie Herenpoort (voor de winnende tender Aanpak Ring Zuid Groningen) een speciale plaats toedicht. Marjo, Jantien, Ron, Johan, Henk, Steffen, Sieds, Durk, Age, Willem, Thea, Huig, Roel, Aries, Willem, Jeroen, Erik Jan, Benny, Bernard, Gerard, Kees, Marijke, Jeroen, Hans, René, Tanja, Coenraad, Sara, Ben, Jaap, Duko, Hans, Niels, Matthew met jullie heb ik écht samen mogen werken met prachtige resultaten als gevolg!

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Anke, Coen, Serge, Janneke, Wietske, Ryan, Pepijn, Femke, Ronald, Geertje, Christof, Anouschka, Marlies, Saskia, Martijn en de clan van 'Beugen-junior': de 'projectorganisatie' van onze ondernemingen loopt als een goed geoliede machine. Het is altijd heerlijk ontspannen als we bij elkaar zijn. Ik hoop daar nog vele jaren van te genieten. Lieve Coen, voor jou blijft er altijd een bijzondere plek in mijn hart. Je warme, lieve en oprechte belangstelling en geweldige, humoristische relativeringsvermogen mis ik nog altijd. Wat had ik graag ook dit met je gedeeld en afgesloten met een ouderwetse 'date'.

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Lieve familie Koops, lieve mam en lieve pap. Ik begin steeds meer op papa te lijken, al schrijvend aan tafel in de woonkamer! Blijven leren, open staan voor nieuwe kennis en nieuwe ervaringen, iedere dag, 365 dagen per jaar, een leven lang. Door dat zelf te doen, ontspannen en genietend, laten jullie zien hoeveel rijkdom het oplevert. Dank jullie wel voor alles!

Margreet, Rutger, Willemijn en Marc, mijn schatjes. Dít project is nu echt af. Er volgen ongetwijfeld nieuwe projecten, dus als het teveel wordt roepen jullie gewoon "paraplu" of "stroopwafel". Want hoe leuk ik het behalen van projectdoelen ook vind, het echte plezier zit in het gezamenlijk bereiken ervan. Samen met jullie ondernemen, ontdekken, gek doen en lachen is het allerleukste dat er is!

Curriculum Vitae

Leonie Koops was born in 1974, on September 29th in Amstelveen, The Netherlands. After she graduated at Han Fortmanncollege in Heerhugowaard she moved to Delft to study Civil Engineering at the Delft University of Technology. In May 1999 she received her master's degree with her Thesis on an analysis in Finite Element Model DIANA at TNO, entitled "Prestressed Concrete Containment Vessel, (I) Axi-symentrical model and (II) Three-dimensional model".

After graduating she started her career at Witteveen+Bos Engineering Consultants. She started working in the area of Urban Development. In this position she worked with public and private partners in projects initiated by local and regional governments. After 5 years she got offered the position Head of the branch office in Breda, which she accepted. Next to the management tasks of the branch office she kept working in projects of which the scope varied from infrastructure, city developments to water management. In 2011 went working as project manager for Large Infrastructure projects. She was assistant project manager of an engineering combination for a infrastructure development (new road with several fly-overs, crossing waterways and railways), process manager for the coordination of logistics of an infrastructure project for the operator-owners of national, regional and local government and project manager in the pre-construction phase for the expansion of a national high way. From January 2017 she is leading the business unit Construction Management at Witteveen+Bos.

At the time Leonie started working as a Project manager for Large infrastructure projects, she started her PhD on the organization of cooperation between public and private partners in order to contribute to enhanced project performance. During her PhD she was a member of the Editorial committee of the Dutch National Research Group and guided several students through their Master Thesis. She presented the sub-studies to practitioners and researchers at the Dutch national IPMA congresses of 2013 and 2016, and at the International IPMA congress of 2014.

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Publications

The application of Q-methodology to gather practitioners' perspectives on collaboration in projects. Suprapto, M., Koops, L., Jalali, A., & Bosch-Rekveldt, M.

2015   Public perspectives on project success–influenced by national culture? Koops, L., Coman, L., Bosch-Rekveldt, M., Hertogh, M., & Bakker, H. *Procedia-Social and Behavioral Sciences*, 194, 115-124.

2016   Identifying perspectives of public project managers on project success: Comparing viewpoints of managers from five countries in North-West Europe. Koops, L., Bosch-Rekveldt, M., Coman, L., Hertogh, M., & Bakker, H *International Journal of Project Management*, 34(5), 874-889.

2017   Exploring the influence of external actors on the cooperation in public–private project organizations for constructing infrastructure. Koops, L., Bosch-Rekveldt, M., Bakker, H., & Hertogh, M. (2017). *International Journal of Project Management*, 35(4), 618-632.

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Infrastructure projects - such as the construction of tunnels and bridges or the (re)construction of roads and highways – are always performed to add quality to society. In The Netherlands, these projects are most often financed by the government, from local to national level, and constructed by private contractors.

Public and private partners increasingly recognize the importance of cooperation to ensure successful execution of projects. However, the partnership arrangements made at strategic level are still difficult to ensure at tactical level, where the project is controlled. This study focuses on the tactical level and specifically on the perspective of the public project managers. It is investigated what they consider project success and how the project management team operates to control the project processes.

The main result of this study is the public Value Chain in which the processes of the combined project organization are captured. Recommendations are made on the primary and secondary processes that binds the partners to each other. The public Value Chain will help collaborating partners to position their specific contribution to the project outcomes more clearly.

Practitioners are encouraged to use the public Value Chain to organize their project activities and discuss the contribution of both public and private parent organizations to an efficient process. It can help partners to execute their specific contribution to the value they are creating. This will further optimize collaboration between public and private partners.