The GOOD the BAD and the TACIT

Explicating implicit procurement knowledge to achieve purposeful management of procurement instruments

H.E.C. Plantinga

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EXPLICATING IMPLICIT PROCUREMENT KNOWLEDGE TO ACHIEVE PURPOSEFUL MANAGEMENT OF PROCUREMENT INSTRUMENTS

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Preface

Public procurement is fascinating. If this thesis has any effect on readers who have not yet taken interest in the field of public procurement, I hope it is that they come to share this view with me. Public procurement is about spending money wisely and receiving value in return. Simple as this may sound, it also makes you wonder about how complicated this can be. I presume that anyone having personal experience with spending money on something major will agree that it can be quite a job to decide what exactly constitutes value in a given case. It gets even more complicated when multiple persons are involved. Imagine yourself trying to agree with your family about, say, which way of spending the holiday budget will best meet everyone's wishes, and you will know what I mean.

Your curiosity may be triggered when you realize that people may think differently about *how* to procure. Every individual probably has his or her reasons, based on experiences, expectations, or simply gut-feeling, about how the procurement process in a given case will influence the value one receives for one's money. Of course, there are many instances where the procurement process is highly standardized, like when buying your groceries in the local supermarket. However, even in those cases people may vary in their opinions about how the procurement process should be shaped. Some may prefer to stick to one supermarket (in professional terms: single sourcing), others may prefer to buy from multiple supermarkets (multiple sourcing).

Your curiosity may even pass the level of average professional purchasing interest if you would start contemplating on the fact that public procurement is about spending *public* money by a *public* organization for the *common* good. This makes things a lot more complicated than private purchasing. Although it is very interesting to consider the many complicating factors, I will not expand on these here. Rather, I want to emphasize that, much like the private situation, procurement professionals may also think differently on how to procure. It is generally recognized that a one-size-fits-all procurement approach will not deliver best value for money. A key task of procurement officials is thus to consider alternative procurement approaches and select the most appropriate ones. Since the results of these considerations ultimately affect value for taxpayers' money, and since every now and again the media report on failing public procurement projects, you may be interested to take a close look at how these considerations are made, and how these result in concrete procurement documents, systems and methods.

This thesis gives an account of what I found when taking such a close look. Having worked for more than a decade as a procurement professional, suddenly I was given the opportunity to investigate and reflect on how my colleagues and me, and also the procurement community in general, go about when considering which procurement approach would be best. It seemed to me that, very much like the private buying situation, the procurement official's reasoning may also be based on personal experiences, expectations, or simply gut-feeling. However, in contrast to the private buying situation, procurement officials may be expected to be skilled in their work. Should a skilled procurement official work differently in this respect?

At some point in the early phase of the research project, it occurred to me that procurement reasoning shows some similarity with a famous western movie by Sergio Leone. Throughout the research project, I found this similarity so helpful that I thought it appropriate to hint at this movie in the title of this thesis. The three main characters in this movie are gunfighters in the Wild West. Filled with greed they compete to find a gold treasure hidden in a chest, get rid of the other two and keep the treasure for his own. After many intriguing plot changes, they end up in a three person quick draw gunfight. The tension is masterfully build up in this scene: who will first draw the pistol and who will survive? The issue with selecting the most appropriate procurement approach is that a similar question comes up with regard to the reasoning of the procurement professionals involved. Which type of reasoning will be first put forward, and will it determine the procurement approach or will it be defeated by the other types?

Taking this analogy one step further, the good, the bad and the tacit stand for three types of reasoning. This reasoning is based on good, bad or tacit procurement knowledge. It is not my intention to spark ontological and epistemological discussions here, but let me say that in this view good knowledge refers to well-constructed knowledge of the functioning of procurement instruments in a certain procurement context. Bad knowledge refers to the ignorance or misunderstanding of good knowledge. Finally, tacit knowledge refers to the knowledge that the procurement official's employs without knowing how to articulate it. Each type of knowledge may form the basis for the reasoning behind a certain procurement approach.

At the start of this research project, I thought this division of good, bad and tacit knowledge could be helpful when investigating the formation of procurement strategies, the operationalisation of these strategies, and the design of the single procurement instrument. Now, at the end of the project, this division is still useful. Although the underlying concepts are much more elaborated and far better anchored in theory, the main idea remains the same.

For procurement professionals reading this thesis, my hope is that the insights gained in this research will enable further improvement of their public procurement practices, because that will ultimately deliver more value for taxpayer's money. For researchers in this field, I believe that the insights of this thesis offer many opportunities for new research. For procurement officials, I hope that this thesis is not too far off from their perception of everyday practice. For readers engaged in other professions, I think that reading this thesis can be worthwhile because the main theoretical concepts can be equally useful in different contexts. Finally, for students considering potentially interesting future professions, I hope this thesis raises further interest in public procurement, because this field is simply fascinating.

Summary

Purposeful procurement instrument management is not a common notion in the literature. It is not common in practice either. Yet these four words accurately capture what this thesis is about. This thesis examines how procurement instruments, such as supplier qualification criteria, contract award methods, and contracts can be purposefully managed.

The notion that procurement instruments should be purposefully managed emerged in procurement practice. The use and development of procurement instruments for tens of sourcing projects, by tens of procurement officials from the same organisation, all at the same time, can easily lead to disorder. While most procurement officials would thus probably agree on the importance of purposeful procurement instrument management, the question is how this notion can be shaped in practice. This thesis reflects the results of a research that had two aims: 1) to theoretically substantiate this notion and 2) to operationalize this notion into concrete, actionable knowledge.

The relevance of this research is given by the fact that public procurement is increasingly becoming a core responsibility for many public organizations. Some public organizations outsource such large volumes, that their level of public service provision is strongly affected by the performances delivered by their contractors. Especially for such high-outsourcing public organizations, it is crucial to achieve high standards in procurement. Purposeful management of procurement instruments is an essential organizational capability to continuously meet these standards.

Procurement instruments shape the procurement process and affect contractor performance. This becomes clear when the role of procurement instruments is considered at the operational level of an outsourcing project. Procurement officials compile a set of appropriate procurement instruments and add project information, so that scope and contractual governance is defined and suppliers can offer a bid in the tendering phase. In addition, procurement instruments also define how the best bid is selected. Finally, procurement instruments may define how contractor performance is measured. To summarize, the procurement process is by and large shaped by the application certain procurement instruments, affecting contractor performance for better or for worse.

To positively affect contractor performance, it is key that procurement officials avail of appropriate procurement instruments. Two criteria are relevant in this respect. Instruments need both be sufficiently tailored to the specific characteristics of the outsourcing project and be state-of-the-art with regard to industry features and procurement regulations. This is where the notion of purposeful procurement instrument management comes into play.

To continuously avail of appropriate procurement instruments, procurement officials need to be conscious of how they manage their collection of instruments. At first sight, instrument management involves at least three aspects. First, the effects of currently used procurement instruments need to be evaluated so that these instruments are either improved or discarded

when no longer appropriate. Second, it also involves that new instruments are developed, applied and, if successful, reused in future sourcing projects. Third, some form of leading principle, rationale or logic is required to do this right. Without that, day-to-day decision making may easily become ineffective, especially when the organization employs a high number of procurement officials and the diversity in sourcing projects is high. Achieving high standards in public procurement would thus be served by a rationale that explains how the collection of procurement instruments can be purposefully managed.

However, the literature provides little guidance on procurement instrument management. Although some aspects of instrument management have been examined, such as contract design and supplier selection methods, this predominantly concerns the single sourcing project. Consequently, the literature lacks an overarching perspective on how high-outsourcing public organisations can best manage their collection of procurement instruments.

This thesis addresses this gap. It employs three general theoretical concepts to examine how procurement instruments can be managed purposefully: 1) strategic alignment, 2) organizational ambidexterity, and 3) tacit knowledge. There is a distinction in how these concepts are used in this thesis. The first two concepts are used to theoretically substantiate the need for purposeful procurement instrument management. However, the third concept is used to elaborate on the other two concepts. Together, the three concepts are used to operationalize the notion of purposeful management, that is, to turn abstract thinking in this regard into practical, workable knowledge.

Strategic alignment is selected as a key concept to reflect on procurement instrument use and development from the perspective of higher level strategy. Strategic alignment refers to the idea that the performance of an organization is affected by the alignment or fit between two or more factors such as strategy, structure, and process. The thesis operationalizes this concept to examine the link between procurement instruments and the public client's strategic goals.

Organizational ambidexterity is selected as a key concept to examine the relation between the use and gradual improvement of current instruments on the one hand, and the development of new ones on the other. Organizational ambidexterity has been defined as the ability of an organization to simultaneously pursue both explorative and exploitative innovation. The thesis operationalizes this concept to analyse the organization's need to organize both sides of instrument management. In particular, the thesis concentrates on the need to design and implement an appropriate integration mechanism. This mechanism is necessary to enable that successful newly developed instruments are reused in future sourcing projects.

The third theoretical concept concerns tacit knowledge. Tacit knowledge refers to the notion about human knowledge that 'we can know more than we can tell'. This concept is relevant for establishing both strategic alignment and organizational ambidexterity. If procurement officials make choices with regard to instrument management aspects, one must be aware that officials may not be able to express all knowledge relevant for motivating the choice. Such tacit knowledge can form an impediment for assessing alignment or integrating new procurement

instruments. However, theory holds that some lesser forms of tacit knowledge can be converted to explicit, and thus transferable, knowledge. Focussing on the conversion of such implicit knowledge can be valuable to solve alignment or ambidexterity issues.

This thesis draws from case studies performed at ProRail, a major public client in the Netherlands. The case studies are used to examine the current situation (IST), to envisage the desired situation (SOLL), and to create concrete organizational procedures for achieving that desired situation (HOW TO). For the latter, the participatory research methods of Design Science and Action Research are employed to ensure that the research delivers output that is actionable in everyday procurement practice.

With regard to the current situation (IST), the key insight developed in this research is that instrument development is whimsical and reuse is often not considered. Patterns of instrument development across multiple projects, reconstructed in case studies, demonstrate unconscious evolution of the instrument. This is caused by implicit reasoning on instrument design, process design and alignment (if considered at all). For as far as the purpose of instrument development has been documented, it was directed at facilitating the sourcing project at hand only. While this does not exclude the option that the procurement official in question also had the contribution to strategic goals in mind, it is clear that this link has not been explicitly considered, discussed and documented. As such, implicit reasoning is an obstacle to purposeful instrument development and reuse.

With regard to the desired situation (SOLL), the key insight developed in this research is that both instrument development and reuse should be regarded as part of a cycle of processes. They relate to two other processes, namely the portfolio configuration process and the selection process. Together, these four processes cover a complete cycle of exploitation, exploration and integration of procurement instruments. Purposeful instrument management during these processes is achieved by explicitly taking into account the extent to which strategic alignment is or can be created between instrument design on the one hand, and the various internal and external strategies and with supply market characteristics on the other. Purpose in the cycle of procurement instrument management processes is thus constituted by the extent to which alignment is achieved.

Finally, the research has delivered two actionable procedures with regard to the question of how to achieve the desired situation (HOW TO). One procedure describes how the development process can be organized in such a way that explication of implicit procurement reasoning becomes manageable. This enables explicit assessment of an instrument's degree of strategic alignment and taking that into account in decision making. The other procedure concerns ambidexterity's integration mechanism concept. This concept is operationalized in the form of a procedure that describes how the reuse of newly developed procurement instruments can be considered, and, if deemed worthwhile, be facilitated. The ultimate goal of both procedures is that these will contribute to the emergence of new organizational routines, in which all those activities needed to achieve strategic alignment and ambidexterity are perceived as self-evident.

With these insights and concrete procedures, this thesis contributes to both literature and practice. While the research is conducted for, and within the procurement department of one single public client organization only, the concepts and operationalisations produced in this research are expected to be of value for many other organizations involved in procurement. Hopefully, through these contributions, purposeful procurement instrument management will soon become a common notion in the procurement discipline.

Nederlandse samenvatting

'Doelgericht management van contracteringsmiddelen' is geen gangbare notie in de literatuur. Het is evenmin gangbaar in de praktijk. Toch geven deze vier woorden nauwkeurig aan waar dit proefschrift over gaat. Dit proefschrift onderzoekt hoe contracteringsmiddelen, zoals selectiecriteria voor opdrachtnemers, gunningsmethodieken en contracten, doelgericht gemanaged kunnen worden.

De notie dat contracteringsmiddelen op een doelgerichte manier gemanaged zouden moeten worden is in de praktijk opgekomen. Het gebruiken en ontwikkelen van contracteringsmiddelen voor tientallen parallel lopende inkoopprojecten, door tientallen inkopers van één organisatie tegelijk, kan makkelijk verworden tot een warboel. Hoewel de meeste inkopers waarschijnlijk zullen beamen dat doelgericht management van contracteringsmiddelen van belang is, is het maar de vraag hoe deze notie in de praktijk vormgegeven moet worden. Dit proefschrift bevat de resultaten van een onderzoek dat op twee zaken was gericht: 1) om deze notie in theoretische zin te onderbouwen, en 2) om deze notie om te zetten naar concrete, praktisch uitvoerbare kennis.

De relevantie van dit onderzoek is gelegen in het feit dat publieke inkoop voor veel publieke organisaties in toenemende mate een kerntaak is geworden. Sommige publieke organisaties besteden dusdanig veel uit, dat het prestatieniveau van hun publieke diensten sterk beïnvloed wordt door de prestaties van hun opdrachtnemers. Het is vooral voor zulke grootschalig uitbestedende organisaties van cruciaal belang dat een hoge mate van inkoopprofessionaliteit bereikt wordt. Doelgericht management van contracteringsmiddelen is een essentiële organisatorische vaardigheid om die mate van professionaliteit te bereiken.

Contracteringsmiddelen geven vorm aan het contracteringsproces en beïnvloeden de prestaties van opdrachtnemers. Dit wordt duidelijk wanneer men op het niveau van een concreet inkoopproject de rol van contracteringsmiddelen in beschouwing neemt. Inkopers stellen voor zo'n project een combinatie van contracteringsmiddelen samen en voegen daar projectinformatie aan toe. Daarmee worden de omvang en de spelregels van het contract gedefinieerd. Op basis daarvan kunnen marktpartijen tijdens de aanbestedingsprocedure een aanbieding doen. Contracteringsmiddelen definiëren ook hoe bepaald wordt wat de beste aanbieding is. Tenslotte kunnen contracteringsmiddelen ook definiëren hoe de prestaties van de opdrachtnemer worden gemeten. Het gehele contracteringsproces wordt zodoende goeddeels vormgegeven door de toepassing van contracteringsmiddelen. Ze kunnen de prestaties van de opdrachtnemer dus in positieve, maar ook in negatieve zin, beïnvloeden.

Om de prestaties van opdrachtnemers positief te beïnvloeden, is het van belang dat inkopers de beschikking hebben over geschikte contracteringsmiddelen. Twee aspecten zijn op dit punt van belang. Contracteringsmiddelen moeten voldoende toegesneden zijn op de specifieke kenmerken van het inkoopproject. Ze moeten daarnaast ook aansluiten op de laatste ontwikkelingen in een bepaald marktsegment en op vigerende wet- en regelgeving op het gebied

van publieke inkoop. Het is om deze redenen dat management van contracteringsmiddelen van belang is.

Teneinde voortdurend over geschikte contracteringsmiddelen te beschikken, moeten inkopers zich bewust zijn van de manier waarop zij hun geheel aan contracteringsmiddelen managen. Op het eerste gezicht spelen hier drie zaken. Ten eerste behoren de effecten van huidige contracteringsmiddelen geëvalueerd te worden, zodat deze ofwel verbeterd kunnen worden, ofwel van de hand gedaan als ze niet meer geschikt zijn. Ten tweede behoren nieuwe instrumenten te worden ontwikkeld, toegepast en, indien succesvol, hergebruikt te worden in toekomstige inkoopprojecten. Ten derde is een bepaald leidend principe, ratio of logica nodig om dit alles op een goede manier te doen. Zonder zo'n leidend principe kan dagelijkse besluitvorming al snel ineffectief worden, vooral wanneer de organisatie vele inkopers en een grote variëteit aan inkoopprojecten kent. Het bereiken van een hoog niveau van inkoopprofessionaliteit zou dus gebaat zijn bij een leidend principe dat verklaart hoe het geheel aan contracteringsmiddelen op een doelgerichte manier kan worden gemanaged.

De literatuur biedt momenteel echter nauwelijks richtlijnen voor hoe inkopers hun management van contracteringsmiddelen zouden kunnen verbeteren. Hoewel sommige aspecten, zoals het ontwerpen van contracten en het selecteren van opdrachtnemers, wel onderzocht zijn, is onderzoek op dit gebied gefragmenteerd en richt het zich vooral op het individuele inkoopproject. Het gevolg hiervan is dat het de literatuur ontbreekt aan een overkoepelend perspectief op hoe frequent inkopende publieke organisaties het best hun geheel aan contracteringsmiddelen kunnen managen.

Dit proefschrift richt zich op deze lacune in de literatuur. Het gebruikt een drietal algemene theoretische concepten om te onderzoeken hoe doelgericht management van contracteringsmiddelen ingericht kan worden: 1) strategic alignment, 2) organizational ambidexterity, en 3) tacit knowledge. Er is een verschil tussen hoe dit proefschrift deze concepten gebruikt. De eerste twee concepten worden gebruikt om de noodzaak van doelgericht management in theoretische zin te onderbouwen. Het derde concept wordt echter vooral gebruikt om aan de eerste twee concepten verdere uitwerking te geven. De drie concepten worden tezamen toegepast om de notie van doelgericht management te operationaliseren. Hier wordt mee bedoeld dat abstract denken wordt omgezet in praktisch toepasbare kennis.

Strategic alignment is geselecteerd als een kernconcept, omdat het handvatten biedt om vanuit het perspectief van hoger liggende strategie te reflecteren op het gebruik en de ontwikkeling van contracteringsmiddelen. Het begrip strategic alignment verwijst naar het idee dat de prestatie van een organisatie het gevolg is van 'het in lijn zijn' van twee of meer factoren, zoals strategie, structuur of proces. Het proefschrift operationaliseert dit begrip om het verband tussen contracteringsmiddelen en de strategische doelstellingen van een organisatie in kaart te brengen.

Organizational ambidexterity is geselecteerd als een kernconcept om de relatie te onderzoeken tussen enerzijds het gebruik en de geleidelijke verbetering van contracteringsmiddelen, en anderzijds de ontwikkeling van nieuwe contracteringsmiddelen. Organizational ambidexterity wordt wel gedefinieerd als het vermogen van een organisatie om tegelijkertijd via zowel exploitatie als exploratie te innoveren. Dit proefschrift operationaliseert dit concept voor de behoefte van de inkooporganisatie beide aspecten van omgaan met contracteringsmiddelen te managen. Het proefschrift richt zich in het bijzonder op de behoefte om een passend integratiemechanisme te ontwerpen en implementeren. Zo'n mechanisme is noodzakelijk om te faciliteren dat succesvolle nieuw ontwikkelde contracteringsmiddelen in toekomstige inkoopprojecten gebruikt worden.

Het derde theoretische concept betreft tacit knowledge. Dit begrip verwijst naar de notie over menselijke kennis dat 'we meer weten dan dat we kunnen zeggen'. Tacit knowledge is zowel voor het bereiken van strategic alignment als organizational ambidexterity relevant. Men moet zich ervan bewust zijn, dat wanneer inkopers bepaalde keuzes maken met betrekking tot aspecten van het managen van contracteringsmiddelen, zij mogelijk niet in staat zijn om al hun kennis onderliggend aan die keuze tot uitdrukking te brengen. Zulke stilzwijgende kennis kan een belemmering vormen voor het beoordelen van strategic alignment of voor het integreren van nieuwe contracteringsmiddelen. Echter, volgens de theorie zijn er ook mildere vormen van tacit knowledge. Deze kunnen wel omgezet worden naar expliciete, en daarmee overdraagbare, kennis. Aandacht geven aan het omzetten van dergelijke impliciete kennis kan waardevol zijn om alignment of ambidexterity problemen op te lossen.

Dit proefschrift is gebaseerd op 'case studies' die zijn uitgevoerd bij ProRail, een van de grootste publieke opdrachtgevers in Nederland. Deze case studies zijn uitgevoerd om de huidige situatie (IST) te onderzoeken, om de gewenste situatie te schetsen (SOLL), én om concrete organisatorische procedures te ontwikkelen waarmee de gewenste situatie bereikt kan worden (HOW TO). Wat dit laatste betreft zijn de participerende onderzoeksmethodes van 'Design Science' en 'Action Research' toegepast om te borgen dat het onderzoek resultaat oplevert dat in de praktijk van alledag daadwerkelijk gebruikt kan worden.

Wat betreft de huidige situatie (IST) levert dit onderzoek het inzicht op dat de ontwikkeling van contracteringsmiddelen grillig is verlopen en dat hergebruik niet vaak in overweging is genomen. In case studies zijn reconstructies gemaakt van de doorontwikkeling van bepaalde contracteringsmiddelen over een reeks van projecten heen. De daaruit resulterende patronen laten een onbewust grillig verlopende ontwikkeling van contracteringsmiddelen zien. De oorzaak hiervan is gelegen in impliciet redeneren over zowel het ontwerp van het contracteringsmiddel, als over het ontwerp van het ontwikkelproces, als over de mate waarin het middel in lijn is met hoger liggende strategie (voor zover dit überhaupt in beschouwing is genomen). Voor zover het doel van de ontwikkeling van een contracteringsmiddel is gedocumenteerd, was dat doel uitsluitend gericht op het faciliteren van het individuele inkoopproject. Alhoewel dit niet uitsluit dat de betreffende inkopers wel degelijk ook strategische doelstellingen in gedachten hadden, is het duidelijk dat het verband daarmee niet expliciet is overwogen, bediscussieerd en

gedocumenteerd. Uit dit alles blijkt dat impliciet redeneren een belemmering vormt voor doelgerichte ontwikkeling en toepassing van nieuwe contracteringsmiddelen.

Het belangrijkste inzicht dat dit onderzoek ontwikkelt met betrekking tot de gewenste situatie (SOLL), is dat zowel ontwikkeling als hergebruik van nieuwe contracteringsmiddelen deel uitmaken van een cyclus van processen. Ze houden verband met twee andere processen, namelijk het portfolio management proces en het selectie proces. Tezamen dekken deze vier processen een gehele cyclus van exploitatie, exploratie en integratie van contracteringsmiddelen af. Doelgericht management van contracteringsmiddelen gedurende deze processen wordt bereikt door expliciet te beoordelen in hoeverre het ontwerp van contracteringsmiddelen in lijn is, of in lijn gebracht kan worden, met de diverse interne en externe strategieën én de kenmerken van een bepaald marktsegment. Doelgerichtheid in deze cyclus van processen wordt dus bewerkstelligd door de mate waarin contracteringsmiddelen 'aligned' zijn.

Tenslotte heeft het onderzoek ten behoeve van het bereiken van de gewenste situatie (HOW TO) twee in de praktijk uitvoerbare procedures opgeleverd. Eén procedure beschrijft hoe het ontwikkelproces zodanig georganiseerd kan worden dat explicatie van impliciete redeneringen gemanaged kan worden. Daarmee wordt expliciete beoordeling van strategic alignment mogelijk gemaakt en kan het resultaat van die beoordeling meegewogen worden in besluitvorming. De andere procedure betreft het integratie mechanisme dat volgens het concept van organizational ambidexterity nodig is. Dit mechanisme is eveneens geoperationaliseerd in de vorm een procedure, welke beschrijft hoe eventueel hergebruik van nieuw ontwikkelde contracteringsmiddelen kan worden overwogen en, indien als zinvol beoordeeld, kan worden gefaciliteerd. Het uiteindelijke doel van beide procedures is dat deze zullen bijdragen aan de ontwikkeling van nieuwe organisatorische routines, waarin het vanzelfsprekend geworden is dat al die activiteiten worden uitgevoerd die nodig zijn om strategic alignment en ambidexterity te bereiken.

Met deze inzichten en concrete procedures draagt dit proefschrift bij aan zowel praktijk als literatuur. Ook al is dit onderzoek uitgevoerd binnen de afdeling van één enkele publieke opdrachtgever, de concepten en de concretiseringen daarvan zoals geproduceerd in dit onderzoek zullen naar verwachting van waarde zijn voor tal van andere inkooporganisaties. Hopelijk wordt door deze bijdragen het doelgericht managen van contracteringsmiddelen spoedig een gangbare notie in het vakgebied.

Contents

Chapter 1

Introduction

1.1 Purposeful management of procurement instruments

Public procurement has become a core responsibility for many public organizations. In the past decades, governments have been increasingly outsourcing public service provision to the private sector such that, in some cases, procurement accounts for 40 – 70% of government consumption (Alonso, Clifton et al. 2015). Consequently, some public organizations outsource such large volumes, that their level of public service provision is strongly affected by the performances delivered by their contractors. Especially for such high-outsourcing public organizations, it is crucial to achieve high standards in carrying out the procurement responsibility.

Procurement instruments, such as supplier qualification criteria, contracts, and contract award criteria, are necessary tools to carry out the public procurement process. This process encompasses many phases, including bid design, supplier selection and contract management (Patrucco, Luzzini et al. 2017). In the bid design phase, procurement officials select specific compilations of procurement instruments and add project information. Once finalized, this compilation of procurement instruments is used to carry out the tendering procedure (supplier selection phase) and embody the contractual relationship (contract management phase). The choice for certain procurement instruments thus influences contractor performance (de Araújo, Alencar et al. 2017).

To positively affect contractor performance, it is key that procurement officials have a variety of state-of-the-art procurement instruments readily available. Variety in instruments is important, because outsourcing projects can have diverse characteristics. They can regard the contracting of works, services or supplies in various industries. To adequately address this diversity, procurement instruments need to be sufficiently tailored to these characteristics (Walker and Rowlinson 2008; Rajeh, Tookey et al. 2015). It is also important that procurement instruments reflect the state-of-art, because industries, products and procurement regulations are subject to change (e.g. Arrowsmith 2012; Schwab 2017).

Both the variety and state-of-art requirement suggest that procurement officials need to deliberately manage their collection of procurement instruments. At first sight, this means at least three things. First, it means that the effects of currently used procurement instruments are evaluated and that these instruments are improved or discarded when no longer appropriate. Second, it also means that new instruments are developed, applied and, if successful, are reused in future sourcing projects. Third, some form of leading principle, rationale or logic is required to do this right. Without that, day-to-day decision making may easily become ineffective, especially when the organization employs a high number of procurement officials and the diversity in sourcing projects is high. Achieving high standards in public procurement would thus be served by a rationale that explains how the collection of procurement instruments can be purposefully managed.

However, the literature provides little guidance on the management of procurement instruments. So far, researchers from various fields of study have focussed on aspects of instrument management only. Of these aspects, the design and selection of procurement

instruments appears to be the most prominent. Research on instrument *design* primarily concerns the design of contracts (e.g. Argyres and Mayer 2007; Girth and Lopez 2019) and of contractor selection criteria (e.g. Holt 2010; Stilger, Siderius et al. 2017). Research on instrument *selection* has received ample research attention (e.g. Love, Edwards et al. 2012; Naoum and Egbu 2016), although this often concerns the more aggregated level of the so-called 'procurement system' than the detailed level of the single procurement instrument. Other aspects of instrument management, such as the development and reuse of new procurement instruments, and how these relate to the use and improvement of current instruments, are missing. Consequently, the literature lacks an overarching perspective on how high-outsourcing public organisations can best manage their collection of procurement instruments.

This thesis addresses this gap by examining how procurement instruments can be managed purposefully. Three theoretical concepts are selected to guide this examination: 1) strategic alignment, 2) ambidexterity, and 3) tacit knowledge. Strategic alignment refers to the idea that the performance of an organization is consequent on the alignment or fit between two or more factors such as strategy, structure, and processes (Miles and Snow 1984). This concept is selected because of the assumption of this thesis that it is crucial to achieve such fit between procurement instruments and the public client's strategic goals. Strategic alignment thus seems an appropriate theoretical concept to give shape to the notion of purposeful management of procurement instruments.

The second theoretical concept concerns organizational ambidexterity. Organizational ambidexterity has been defined as the ability of an organization to simultaneously pursue both explorative (discontinuous) and exploitative (incremental) innovation (Junni, Sarala et al. 2013). This concept is selected to describe and analyse the client's need to organize the two sides of instrument management. On the one hand, current instruments are used and gradually improved (exploitation). On the other hand, new instruments need to be developed to address changing environments (exploration). Recognizing both sides of instrument management as an instance of organizational ambidexterity, this theoretical lens is employed to examine how both can be properly connected.

The third theoretical concept concerns tacit knowledge. Tacit knowledge refers to the notion about human knowledge that 'we can know more than we can tell' (Polanyi 1966). This general concept is selected to theorize on situations in which procurement officials are not capable to fully articulate their knowledge. This concept is relevant both for examining strategic alignment and organizational ambidexterity. If procurement officials make choices with regard to instrument management aspects, such as instrument selection or design, one must be aware that not all of the officials' knowledge relevant for explaining the choice can be expressed. However, whereas pure tacit knowledge per definition cannot be articulated, researchers hold that some lesser forms of tacit knowledge can be converted to explicit, and thus transferable, knowledge (Nonaka and Von Krogh 2009). Such knowledge conversion can be valuable to explain an official's reasoning with regards to alignment or ambidexterity issues.

This thesis draws from case studies performed at ProRail, a major public client in the Netherlands, to examine how purposeful management of procurement instruments can be achieved. Using strategic alignment as the main theoretical lens, it argues that purposeful instrument management can be shaped by consciously taking into account the alignment between procurement instruments and the organization's strategic goals in decision making processes.

1.2 Research motivation

This research originated from two main observations made by one of the procurement managers of the organization that financed this research. The first observation concerned the procurement department's effort to customize its procurement approaches to the specific characteristics of an industry. Since construction contracts simply don't work well for the IT-industry, and vice versa, customization for various industries is part of the procurement department's core business. The other observation concerned the experienced effort to demonstrate how procurement practice contributes to, or complies, with overarching targets and regulations.

It can easily be imagined that combination of the first and second observation results in a complicated picture of a multitude of customized procurement instruments on the one hand, and in the other hand the range of organizational goals, strategies, targets and obligations, that is formulated in the extensive documentation that covers organizational strategies, concession contract obligations and public procurement legislation. Yet, somehow, the link between the operational, everyday procurement decisions and the set of organizational goals and obligations is there, or should be there. At any rate, this link requires explanation every now and again.

The manager's observations overlapped with the observations of the author of this thesis. Working as a procurement official among many colleagues at the procurement department of a high-outsourcing public organization, it struck how often the officials' opinions on the effects of procurement instruments differed while the deeper logic behind the design of these instruments remained undiscussed. Consequently, the choice for using a certain set of procurement instruments in a specific sourcing project seemed largely dependent on which official is involved. Although variety is tempered by overall procurement policy, a set of standardized procurement instruments, and decision-making by line management and tender boards, still the partly unarticulated opinion of the individual procurement officials seems to strongly influence procurement instrument selection and design.

It also struck how much effort officials take to customize procurement instruments to the needs of specific procurement projects and how limited one's knowledge of another one's customizations is. Surely, knowledge on customized procurement instruments is shared in the procurement department, and every now and again management tries to standardize new instruments and methods of working, but there seems to be an imbalance between the two.

Finally, what struck most was that the development of innovative procurement instruments seemed to be quite acceptable, despite the common awareness that instrument development

can be time-consuming and is inherently risky. The procurement department's recent history shows the application of some very successful innovative instruments, but also shows several development trajectories that were stopped halfway or proved unsuccessful in practice. The resources spent on these trajectories trigger critical questions with regards to the why and how of instrument development. Still, initiatives to develop new instruments appeared invariably encouraged.

Putting all these observations together, the idea emerged that the procurement department's current practice would benefit from research that critically reflects on how the public organization's set of procurement instruments can be managed more purposefully. This is not to say that current instrument management is undeliberate. On the contrary. It was recognized that the need to tailor procurement instrument design to the characteristics of a given sourcing project also has adverse effects. Sensible as tailoring may be on project level, the downside is that on the overarching level the client's procurement practice can be rather whimsical. It is challenging for the suppliers facing all this variety in procurement instruments, to oversee, understand and deal with the peculiarities of each single procurement instrument used in a specific sourcing project. It can also be difficult for client personnel, and even for the procurement department's officials specialized in these issues, to sufficiently understand and capitalize on the variety of instruments. Purposeful management of procurement instruments thus emerged as a notion to get to grips with instrument customization and development. It also stood for the capability to explain procurement's contribution to, and compliance with, organizational goals and obligations.

The motivation for this research thus consisted of the need to operationalize this notion of purposeful management of procurement instruments. Which theories used in academia can help to shape this notion, how can these be translated to the public procurement context, and how can these be turned into constructs that are workable in everyday procurement practice? These are the main questions that motivated this research.

1.3 Practical context

The practical context of this research project is determined by the fact that the author has been granted the opportunity to conduct a doctorate research for, and in, the procurement department of ProRail. ProRail is a public sector organisation in the Netherlands that manages the countries' rail infrastructure. In financial volume, ProRail is the second largest public sector client in the Netherlands. ProRail outsources over 80% of annual expenditures and yearly runs between 400 and 500 tendering procedures. Given these figures, it is clear that procurement has a significant influence on ProRail's performance.

As with many similar organizations, ProRail has been professionalizing its procurement practice over the years. This is reflected by the many changes that occurred over time. When the author joined the procurement department in 2001, it was only in its fourth year of existence as a distinct department. Being primarily concerned with the procurement of construction projects at that time, it was moving away from the common traditional contracting practice by

implementing new procurement approaches such as Design and Construct and performance based maintenance contracting. Nowadays, the procurement department is also involved in many other industries than the construction industry, and its procurement practice features modern concepts such as supplier management, category management, and sustainable procurement. Also, since a few years, the department's position within the organization has changed. It has adopted a more strategic role since the procurement department's head became member of ProRail's executive committee. Finally, the number of procurement officials has grown substantially, which means that many more persons are involved in the use and development of procurement instruments nowadays. It is partly because of these developments that the need was felt to get to grips with the increasing number of customized procurement instruments. It became increasingly clear that professionalization not only involves applying appropriate procurement instruments, but that it also involves keeping a balance between standardization and customization, and demonstrating procurement's contribution to the organization's overall performance.

ProRail's ambition to further professionalize the procurement function matches with a general trend. It has been noted that public procurement has been maturing as a profession (Prier, McCue et al. 2010) in the last fifteen years. The procurement function is becoming increasingly meaningfully involved in buying decisions (Schiele and McCue 2006). In this regard, public procurement follows the development in the private sector (Murray 2009), where purchasing has evolved from a largely administrative role to a strategic role and determinant of firm performance (Zimmermann and Foerstl 2014). There, the concept of strategic purchasing has been launched and examined long since (Ellram and Carr 1994; Carr and Smeltzer 1997; Carr and Pearson 1999; Chen, Paulraj et al. 2004). However, in the public sector literature, to date the term 'strategic procurement' is only sparsely used and its meaning is not profoundly elaborated (White, Parfitt et al. 2016; Patrucco, Moretto et al. 2019).

1.4 Procurement instruments

As mentioned in the introduction section, this thesis employs the term 'procurement instruments' to refer to the documents, methods, systems and procedures that procurement officials used to carry out the procurement process. The procurement process has been described as a range of activities that starts with budget and demand management (i.e., planning of procurement needs and specifications) and ends with vendor rating (i.e., evaluating supplier performance) (Patrucco, Luzzini et al. 2017). The term procurement instruments thus refers to a potentially broad variety of tools that support procurement process activities.

The term procurement instruments is rather uncommon in literature. In this thesis it is introduced to facilitate detailed demarcation of its object of interest, accepting the consequence of adding yet another term to the already confounding variety of procurement terminology. The problem is that procurement instruments have been described before on various aggregation levels and with various research intentions. To give some examples, overlapping terminology ranges from 'project delivery systems (Konchar and Sanvido 1998)', 'procurement strategies'

(Walker and Hampson 2003), 'procurement systems' (Walker and Rowlinson 2008), 'procurement routes' (Oyegoke, Dickinson et al. 2009) to 'procurement options (Osipova and Eriksson 2011)' and 'procurement methods' (Murdoch and Hughes 2002; Naoum and Egbu 2016). None of these terms provide adequate descriptions of the focus of this thesis.

To clarify the meaning of procurement instruments in this thesis, it is useful to contrast it with the term *'procurement system'.* In the literature, a procurement system is an overarching term that includes not only instrumental aspects such as the contract document and the tender procedure, but many other aspects, such as culture, economic and political environment and sustainability (Rowlinson and McDermott 2005). However, interpreted in a narrow meaning, the term procurement system merely refers to the complete set of procurement instruments for a given service, work or supply. In other words, procurement systems – in our narrow sense – are merely *abstractions* of procurement practice. To apply any procurement system in practice, procurement officials have to operationalize the concept into a concrete set of documents, procedures, methods, etc.

The term procurement instruments thus refers to the level of granularity below that of procurement systems. Descending to this level helps to analyse in greater detail what is meant with a certain procurement system. For instance, the procurement system 'Design and Construct' stands for bundling both design and construction activities in one contract. However, the contract documents generally used for Design and Construct in the Netherlands (UAV-GC) differ from those generally used in the United Kingdom (NEC3). These differences are not bound to nation level only, but may also be different for various sectors in one country. Differences can even occur between two Design and Construct projects of one single client. For instance, Design and Construct can be constituted by different types of tender procedure, contract award criteria or contractual conditions (e.g. Watermeyer 2012). For the purpose of this thesis, it is thus important to work with terminology that facilitates identification of such differences. Figure 1 on the next page illustrates these two levels of granularity.

The level of procurement instruments is appropriate for analysing and managing the evolution of procurement approaches. By investigating the evolution of single procurement instruments, changes can be detected that can go unnoticed at the procurement system level.

Admittedly, breaking down procurement systems into single components can be problematic. It can be rather difficult to clearly define the boundaries of a single instrument, since some instruments are typically nested. Studying one single instrument thus may involve the examination of multiple instruments. For instance, the CO2-performance measurement system (Rietbergen and Blok 2013) in a given tendering procedure is activated through a CO2 contract award criterion. This criterion typically is only one of a set of contract award criteria. In turn, these criteria and their relative weightings are described by the method for calculating the best bid, in jargon known as the economically most advantageous tender (EMAT)(Stilger, Siderius et al. 2017). Interestingly, this method typically forms only one section of the document describing the rules and conditions of the tendering procedure. The nested character of procurement

instruments may thus be an impediment to breaking down procurement systems into undisputable, clearly demarcated components.

This thesis does not aim to provide for a systematic categorization of procurement instruments. It rather avoids categorization by stating per case concerned how the demarcation of a single procurement instrument is understood. The advantage of this approach is that it allows for the flexibility needed in practice to analyse patterns in the evolution of procurement instruments.

1.5 The link between procurement instruments and strategic goals

The choice to focus this research on procurement instruments is based on the assumption that these instruments are of strategic importance. Not only do procurement instruments affect contractor performance, they can also contribute to the client's strategic goals. This assumption is based on the idea that, ultimately, the client's overall performance is affected by the performances delivered by contractors in single projects. Admittedly, overall performance is not the same as strategic goals. However, if the main aspects of overall performance, as perceived by the client and its key stakeholders, are adequately reflected in the form of strategic goals, then procurement instruments can ultimately link with these goals. Therefore, by affecting project performance, procurement instruments can contribute to strategic goal achievement.

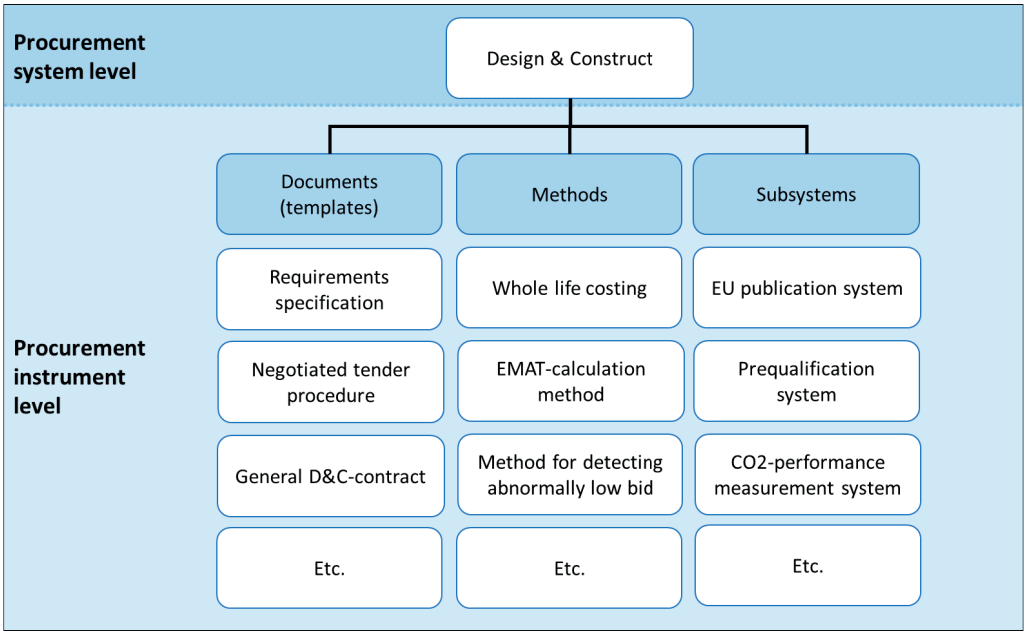

Figure 1: Example of how a procurement system consists of various procurement instruments

This thesis thus assumes that the selection of current procurement instruments, or the design of new instruments, for a given project affects project performance, and that all project performances affect the client's strategic goals. To the author's knowledge, there is no public procurement research that investigates this particular link. However, a similar argument is more often employed. This regards the achievement of public policy goals. It is commonly argued that

public procurement can be used as a policy tool to reach desired outcomes in society, such as social and environmental sustainability (Grandia and Meehan 2017), to accelerate economic recovery (Murray 2009), or to drive innovations (Edler and Georghiou 2007).

Next to public procurement literature, there are other fields of literature that display similar philosophies. For instance, construction management literature extensively discusses the link between certain procurement instruments and project performance. To achieve optimal project performance, public clients are advised to consider per project which procurement alternative best matches the needs of each project (see, for example, reports issued in the United Kingdom (Treasury 2013), the Netherlands (Jansen 2009) and Sweden (Eriksson and Hane 2014)). This advice is based on the common conviction that 'a 'one-size-fits-all' approach to procurement is unwise' (Walker and Rowlinson 2008). Construction management literature therefore contains many papers on various procurement systems, including Design-Bid-Build, Design and Build, Design-Build-Maintain, and Public Private Partnerships.

Construction management researchers have also focussed on the procurement instrument level, although not all procurement instruments receive equal research attention. Here, the link with project performance is also clearly expressed. For example, Holt (2010) examines over 90 relevant academic publications on choosing the best *method for contractor selection,* dating from the period 1990 to 2009. As a justification for all this research attention, Holt (2010) states that '*The significance of selecting the most appropriate contractor for a given selection setting is of exceptional importance, largely, because of the positive "association" between employing a good contractor and achieving project aspirations*' or, conversely, between *'… employing a poor contractor and likelihood of unsatisfactory project outturn'*. In a similar vein, others state that contractor selection *'… is perhaps one of the most critical undertakings performed by clients, the effectiveness of which is directly related to project success and the achievement of specified objectives*' (Watt, Kayis et al. 2010).

One may argue that some procurement instruments affect strategic goals rather than project goals. For instance, instruments targeted at environmental or societal sustainability may incur negative effects on projects in terms of time, cost and quality. Better sustainable materials can raise project cost or imply lesser quality. The argument can thus be that, from the perspective of the project team, these instruments would not have been applied if some higher level strategy would not have prescribed it. However, this seems a matter of perspective, since for external stakeholders it is the client – and not the client's project management team – that accepts the project consequences.

Therefore, whether procurement instruments directly or indirectly affect strategic goals is unimportant here. What is important, is that procurement instruments and performance are generally linked in the literature. As argued above, this link can also be made with strategic goals or public policy, provided that these adequately describe aspects of performance. It is therefore reasonable to assume that procurement instruments can contribute to the client's strategic goals, and thus that it is strategically relevant to manage procurement instruments purposefully.

1.6 Theoretical context

Perhaps the theoretical approach of this thesis is best clarified by contrasting it with current research streams on the procurement function. One prominent research stream in this regard concerns the use of maturity models. In the private sector literature, several models have been proposed to measure the procurement function's level of sophistication by classifying several purchasing practices into different maturity stages (Rozemeijer, van Weele et al. 2003; Søgaard, Skipworth et al. 2019). The general idea of such models is that a higher level of purchasing maturity is associated with a better overall performance of the company (Schiele 2007). Many of these models have in common that they address a wide range of procurement aspects, such as planning, structural organization, process organization, human resources, controlling and collaborative supply relation (Bemelmans, Voordijk et al. 2013). Although the use of maturity models for professional development of the purchasing function has been criticised (Andreasen and Gammelgaard 2018; Søgaard, Skipworth et al. 2019), they are commonly accepted in literature and practice. Following this private sector concept, maturity models have also been proposed for *public* sector procurement e.g. (Hermans, Volker et al. 2014; van Zoest, Volker et al. 2019).

Like the purpose of maturity models, this thesis aims to contribute to the further professionalization of the procurement function. However, its focus and route are quite different. Unlike the broad range of aspects covered by maturity models, the focus of this thesis is on one aspect of procurement practice only. It concentrates on the development and reuse of new procurement instruments, and in particular on how this can be managed purposefully. Therefore, unlike the common approach in maturity models to address procurement practices on high levels of abstraction only, this thesis goes into great detail. In contrast to maturity models, this research prefers depth over breadth to achieve further professionalization of the procurement function.

As discussed in the introduction section, this thesis employs three main theoretical concepts. This section elaborates the relevance of each of these concepts for this thesis.

1.6.1 Strategic alignment

As already introduced above, the assumption underlying this thesis is that the concept of strategic alignment is helpful for achieving purposeful management of procurement instruments. Strategic alignment has its origins in contingency theory (Drazin and Van de Ven 1985; Ginsberg and Venkatraman 1985). According to contingency theory, there is no best way to manage an organization. Better performance can be achieved by adapting to contingencies (Spina, Caniato et al. 2016). Based on these premises, strategic alignment concerns the idea that better performance results from a fit between certain variables within the organization or its environment.

Strategic alignment is a rather uncommon theoretical lens in public procurement literature. It is not listed in overviews of public procurement research (Flynn and Davis 2014; Patrucco, Luzzini et al. 2017) and extant public procurement literature has only recently started to apply strategic

alignment to procurement. Patrucco, Luzzini et al. (2017) propose a conceptual alignment framework that identifies dimensions of strategy and types of procurement strategies. Glas, Schaupp et al. (2017) use the concept to examine the fit of organizational archetypes with strategic goals. Other researchers in this field only use the words alignment or fit without going into details about it (Murray 2001; Murray 2009; Staples and Dalrymple 2016).

The private sector purchasing literature has elaborated the concept of strategic alignment in more detail. In this field of literature, contingency theory is listed as a major external theory (Spina, Caniato et al. 2016). Based on an extensive literature review, Søgaard, Skipworth et al. (2019) identify research on strategic alignment in the purchasing literature as a distinct research stream. They introduce the term 'purchasing strategic alignment' in order to distinguish this 'pure' and theoretically underpinned form of alignment from other concepts such as strategic purchasing. In their view, purchasing strategic alignment refers to the consistency between purchasing strategy and practices with the firm's objectives (Søgaard, Skipworth et al. 2019).

The importance of purchasing strategic alignment is that achieving such alignment positively affects firm performance (Gonzalez-Benito 2007; Rodríguez-Escobar and González-Benito 2017). For instance, Baier et al. (2008, pag. 46) firmly state "that creating strategic alignment is absolutely vital for performance". However, the construct of purchasing strategic alignment is not problem-free. It lacks agreement on what business or purchasing strategies exist, which purchasing strategies align with which business strategies, and on how alignment is measured (Søgaard et al. 2019). Also, Søgaard et al. (2019) observe that whereas academic literature generally assumes that the purchasing strategy follows the firm strategy as a single contingency, practitioners describe their strategies as being based on several contingencies, including internal, external, technological and product- or supply-based factors.

Despite these conceptual problems, and the fact that there are significant differences between public and private sector procurement in terms of regulations, purpose and structure (Telgen et al. 2007; Arlbjørn and Freytag 2012), this thesis assumes that the construct of purchasing strategic alignment can be equally important for public procurement in general, and for procurement instruments in particular. The applicability of strategic alignment to procurement instruments is further supported by literature from the field of construction procurement, although there the term alignment is scarcely used. For instance, Naoum and Egbu (2016 p. 328) contend that '*there is no one best [procurement] method to achieve success. It is contingent and depends upon the needs of the client, characteristics of the project and the environment that the project is operating under.'* The notion of contingency in the sense of aligning the procurement method to certain characteristics is clearly brought forward in this statement.

Literature thus indicates that strategic alignment is a relevant concept that has been used before in both public and private procurement research. This supports the idea that it can also be helpful for operationalizing the notion of purposeful management of procurement instruments. If the concept were transposed and tailored for examining the development of procurement instruments, it would offer a theoretical lens to assess the contribution of these instruments to

the client's strategic goals. Decision making based on this assessment would thus rationalise the management of procurement instruments in this regard.

1.6.2 Organizational ambidexterity

The second theoretical concept relevant for this thesis is organizational ambidexterity. This refers to an organization's capacity to do two things equally well (Birkinshaw and Gupta 2013). In research, these two things usually concern the duality of exploitation and exploration as introduced by March (1991). The duality for organizations is that exploitation and exploration need to be balanced, since exploitation may result in short-term profit through efficiencies, whereas, exploration may result in long-term profits through innovations. The problem is that an overly heavy focus on either exploitation or exploration will lead the organization into a 'trap' (Junni et al. 2013; O'Reilly III and Tushman 2013). The exploitation of current competences at the expense of exploring new ideas causes organizational inertia, preventing the organization from properly adapting to changing environmental conditions (the 'success trap'). In contrast, too much focus on exploration causes innovations to be replaced by new ideas before they have had the opportunity to contribute to the firm's revenue stream. This is referred to as the 'failure trap' (Junni et al. 2013). Organizations are ambidextrous if, by balancing exploitation and exploration, they are able to avoid both traps.

The concept of organizational ambidexterity is helpful for achieving purposeful management of procurement instruments. As mentioned above, public clients not only maintain use and gradually improve standardized procurement instruments (exploitation), they also develop or adopt new instruments (exploration). The management of procurement instruments becomes more purposeful if decision-making on the use of standardized instruments versus the development of new instruments takes into account the need to balance the two. Also, ambidexterity theory identifies the need to apply mechanisms that integrate the exploration results with exploitation. Such mechanisms facilitate that new procurement instruments become exploited. Therefore, whereas strategic alignment can be helpful to assess the contribution of procurement instruments to strategic goals, ambidexterity can be helpful to organize the development of new procurement instruments in a more purposive manner.

However, similar to the situation for strategic alignment, there is no conceptualization for organizational ambidexterity present in the literature that is appropriate for the specific context of public procurement. Therefore, this research project also includes the task to make organizational ambidexterity applicable to procurement instrument management.

Finally, a convenient consequence of using ambidexterity is that it is also a useful concept to demarcate the focal area of this thesis. Although purposeful management of exploitation seems equally important as exploration, this thesis primarily examines the *exploration* of procurement instruments. The main reason for this focus is primarily a practical one. In the organization where this research is conducted, exploitation of procurement instruments is far better organized than exploration. The greatest contribution potential of this research thus regards this area of exploration.

1.6.3 Tacit knowledge

The concept of tacit knowledge is the third major theoretical concept used in this research project. Tacit knowledge refers to personal knowledge that is difficult or even impossible to articulate. It stands in contrast with explicit knowledge, which refers to knowledge that is articulated or written down. The distinction between tacit and explicit knowledge has been conceptualized as a continuum. Whereas tacit knowledge in its extreme form cannot be articulated, other forms of tacit knowledge can be converted to explicit knowledge (Nonaka and Von Krogh 2009).

The concept of tacit knowledge is relevant for this research project because it offers a theoretical lens to examine the reasoning of procurement officials with regards to the effects of procurement instruments. Both when instruments are selected for application in a sourcing project and when new instruments are developed, decision making can be determined by the expectations of procurement officials regarding the effects that the instrument will have on contractor performance. For instance, procurement officials will probably not select the lowest price as contract award criterion, if the quality of the product or service is hard to define. Instead, they will apply a criterion that weighs quality to price (Bergman and Lundberg 2013). It seems reasonable to assume that the knowledge underlying this reasoning is not always expressed, or that the reasoning itself is expressed, or indeed that officials are able to fully express it. The concept of tacit knowledge offers a theoretical lens to understand and deal with such situations.

This way, tacit knowledge of procurement officials seems important to explain practical decision making with regards to issues that can either be framed from the strategic alignment perspective or the ambidexterity perspective. Expecting that intuition and routine strongly influence decision making in practice, tacit knowledge forms a useful supplement to the other two theoretical concepts.

To summarize, three theoretical concepts have been selected to guide this research: 1) strategic alignment as the main concept to achieve purposeful management of procurement instruments, 2) organizational ambidexterity to conceptualize the use and development of procurement instruments, and 3) tacit knowledge to examine the reasoning of procurement officials with regards to decision making on procurement instruments.

1.7 Research question and approach

1.7.1 Research question

The practical and theoretical context described in the previous section motivate the need to investigate how the notion of a ‘purposeful management of procurement instruments’ can be operationalized. To describe this how-question more adequately, the formulation of the overall research question of this thesis is based on three main elements. The first element concerns strategic alignment. It has been selected as the main theoretical concept to give an interpretation to the notion of purposeful management, because it values operational decisions and actions for their contribution to *strategic goals*. Second, the *development and reuse* of new

procurement instruments is in focus, rather than the use and gradual improvement of extant instruments. Third, the research also expressly aims to deliver actionable knowledge in order to contribute to the *public client's procurement practice*. Taking these three main elements together, the overall research question of this study is formulated as follows:

How can the development and reuse of new procurement instruments be managed in procurement practice in such a way that these instruments purposefully contribute to the public client's strategic goals?

The next sections explain the researcher's philosophical paradigm, the research methodology, the research sub questions and the research approach per sub question.

1.7.2 Constructivist paradigm

In general, the choice for a project's research methodology is influenced by the researcher's stance regarding the various philosophical paradigms. These paradigms can be understood as a spectrum, with objectivism on the one end, and constructivism on the other. Objectivism is the dominant paradigm in the natural sciences. An objectivist paradigm is typified by the idea that 'facts are facts', i.e. that facts can be objectively measured. Typical for objectivism is a deductive research approach *explaining* how and why things happen.

The other end of the paradigm spectrum is formed by constructivism. This is the dominant model in social sciences. It is characterized by the idea that 'people are people', i.e. that the objects of study are people that – in contrast to nature – do interact with the researcher. Typical for constructivism is an inductive research approach aimed at on *understanding* how and why things happen.

Objectivism and constructivism are often associated with quantitative and qualitative methodologies (Tashakkori and Teddlie 2010). However, according to a third paradigm, that of pragmatism, both methodologies can be used to investigate certain phenomena. Both methodologies can be complementary, since a quantitative methodology creates breadth, while a qualitative methodology creates depth (Flyvbjerg 2001). Consequently, the research question should guide the choice for the methodology.

The research question of the present research project is aimed at understanding rather than explaining, at depth rather than breath. The area of interest is determined by human behaviour. For example, the assessment of whether a certain level of strategic alignment has been achieved is a matter of opinion rather than fact. The researcher therefore employs a constructivist paradigm.

1.7.3 Engaged Scholarship

This research project applies Engaged Scholarship methodologies. Van de Ven (2007) defines Engaged Scholarship (ES) as 'a participative form of research for obtaining the different perspectives of key stakeholders (researchers, users, clients, sponsors, and practitioners) in studying complex problems'.

This choice is influenced by the fact that this project has two distinct practical aims. The first is to deliver value to ProRail as the client of this project. The second is that the researcher obtains the doctoral degree. It would appear that both aims boil down to the same: to perform good research. However, this conclusion is not straightforward. The academic and practitioner communities often hold contrasting views of what constitutes good research (Martin 2010). As Martin (2010, p. 211) observes, *'Most practitioners want studies that provide 'answers', while many academics prize theory-driven research which may have no obvious practical application'*. These contrasting views have given rise to many publications on what is commonly alluded to as the 'academic-practitioner gap' (Bartunek and Rynes 2014). Several tensions are associated with this gap, including differing logics, time dimensions, communication styles, rigor and relevance, and interests and incentives. The bulk of the literature focusses on the tension between academic rigor and practical relevance, with some scholars arguing that these are almost mutually exclusive, while others argue that these may be complimentary (Bartunek & Rynes 2014). Evidently, in this research project the latter view is taken.

As an answer to the academic-practitioner gap, it is argued that both communities are to engage with each other. The research methodology that enables this is commonly known as Engaged Scholarship. In ES, scholarship is engaged with (rather fan for) practice. Viewing different levels of engagement as a spectrum, Martin (2010) proposes five different types of engaging with practitioners:

- practitioners as informants;
- practitioners as recipients;
- practitioners as endorsers;
- practitioners as commissioners;
- practitioners as co-researchers.

In the first type, researchers merely engage with practitioners as objects of study or gatekeepers to important data sources. The second, third and fourth types represent increasing levels of engagement. In the fifth type, practitioners and researchers work alongside each other at almost all stages of a research project.

The author's position in this research project is reflected by the fifth and most engaged type. Martin (2010, p. 217) illustrates this type with cases in which *'practitioners take leave of absence from their organisations to work on a specific study. In others honorary researchers participate over an extended period in a series of studies. There are also examples of practitioners who somehow manage to juggle research and full-time 'day jobs'.'* The word 'juggling' is certainly applicable here, since the author had to divide his time between the often short term deadlines of procurement activities and the seemingly long term research activities.

The need for bridging the gap between theory and practice, and the potential of ES to achieve that, is also promoted in fields of literature relevant to our research, such as public procurement literature (Martin 2010), private purchasing literature (Walker, Harland et al. 2008), and construction management literature (Hartmann and Dewulf 2015; Voordijk and Adriaanse

2016). For instance, (Walker et al. 2008, pag. 143) state that ES *'is highly appropriate for public procurement because of its complex, practical and dynamically changing nature, and also because tax payers and citizens deserve to have their money spent strategically and wisely.'* The choice to applying ES in this research thus seems by no means inappropriate.

1.7.4 Three types of Engaged Scholarship

In exploring what ES could mean for construction management research, Voordijk and Adriaanse (2016) discuss three types of ES: practice research, design research and action research. The distinctions between the three are explained through their different knowledge–action relations: action theories or 'knowledge about action', design research or 'knowledge for action', and action research or 'knowledge through action'. (Voordijk and Adriaanse 2016) argue that the three types presuppose each other. Understanding practice is needed to design useful propositions; to reach a deeper understanding of practice it is necessary to change it; and the propositions and interpretations of practice are ultimately tested through attempts to improve practice.

Each of these three types of ES is incorporated in this research. Firstly, the research is about understanding the current practice of procurement instrument management (practice research). Secondly, the research delivers procedure designs to improve the management of procurement instruments (design research). Thirdly, the research attempts to change current practices through problem solving in response to the client's need (action research).

1.7.5 Research sub questions

Several sub questions have been formulated during the research project. These address the current situation (IST), the desired situation (SOLL) and how that desired situation can be achieved (HOW TO). The logic of this structure is as follows. First, to gain a better understanding of the current situation, initial evidence needs to be collected to substantiate the perception that currently the development of procurement instruments is lacking purpose. The first sub question raised in this research thus concerns a 'how is' question that investigates the current situation.

Second, to envisage the ideal situation, general theoretical concepts need to be tailored to the procurement instrument context. Two 'how should' questions are raised to investigate the SOLL-situation.

Third, to help achieve the ideal situation, operational designs for action need to be developed. Two 'how to' questions are raised to investigate how organizational processes can be organized in practice in such a way that the ideal situation can be achieved. Figure 2 on the next page illustrates how the overall research question is divided in five sub questions, how these are clustered in IST, SOLL and HOW TO, and why each sub question is raised.

	Overall research question	
	How can the development of new procurement instruments in the public client's procurement practice be managed in such a way that these instruments purposefully contribute to the public client's strategic goals?	
	Research sub question	**Explanation**
Problem situation (IST)	A. Is instrument development currently lacking higher purpose?	The motivation for this research is based on the suspicion that, when viewed from a higher level than that of the single sourcing project, the client's current practice of procurement instrument development is lacking higher purpose.
Desired situation (SOLL)	B. How to position instrument development against other processes?	Public clients both use extant procurement instruments and develop new ones. However, which processes are involved and how these relate is ambiguous in the literature.
	C. How to tailor strategic alignment to instrument development?	Extant public procurement literature offers no conceptualization of the strategic alignment concept that is tailored to the procurement instrument context.
Improving current situation (HOW TO)	D. How to deliberately create strategic alignment during instrument development?	To improve the current situation, practice needs to change. This question explores how the instrument development process can be managed in practice in such a way that strategic alignment is created.
	E. How to purposefully manage the reuse of newly developed instruments?	The potential for future reuse of newly developed instruments needs deliberate assessment to enhance their contribution and avoid the negative consequences of one-off applications.

Figure 2: Overview of research questions

1.7.6 Research approach per sub question

Sub question A concerns assessment of the current situation. This is approached by a qualitative case study (Yin 2014) on project alliancing. The aim was to reconstruct the reasoning behind different procurement instrument designs over the course of multiple projects. This reconstruction consisted of three research activities: 1) identifying and singling out project alliances from all the other procurement approaches applied in the client's sourcing projects over a period of 15 years, 2) mapping variations within the concept of project alliancing, and 3) identifying documented motives that drove these variations.

This case was important for the continuation of this research, because the case results indicate that procurement instrument development is lacking an overarching purpose, or at least is lacking the ability to rationally demonstrate linkage with higher purposes. Evidence for this lack of purpose is also found in later case studies.

Sub question B concerns the structuring of the conceptual background for the organic evolution and the implicit reasoning found in the project alliancing case study. Sub question B aims to position the procurement instrument development process against other organizational processes concerned with the management of procurement instruments. This is approached by

observing practice and theorizing on these processes, because extant literature but offers no overview of how procurement instruments are managed within an organization. In particular, the reasoning behind procurement instruments is modelled. The use of this model is illustrated with case study results. This time, the case study concerns a procurement instrument known as qualification system.

Sub question C regards the tailoring of the strategic alignment concept for the context of procurement instruments. A conceptual model for strategic alignment is derived from a critical analysis of current representations of strategic alignment in the public and private sector literature. Similar to the approaches for sub questions A and B, the model is illustrated with case study results. The case concerns the reconstruction of strategy formation during the development of an instrument for precommercial procurement.

So far, the research approach can be characterized as practice research, the first type of Engaged Scholarship. To approach **sub question D**, Action Research (Azhar, Ahmad et al. 2009; Maestrini, Luzzini et al. 2016) is applied. Sub question D questions how procurement officials can deliberately create strategic alignment between the procurement instrument and – ultimately – the client's strategic goals. The Action Research is aimed at creating strategic alignment during an ongoing development process. The case concerns the development of a new version of the qualification system analysed previously in this research. One of the Action Research interventions during this development process is the introduction of a procedure proposal to structure this process.

Sub question E regards the reuse of newly developed procurement instruments. It questions how reuse of such instruments can be managed purposefully in practice. This question is approached by Design Research (Wieringa 2014; van Aken, Chandrasekaran et al. 2016). A procedure is developed to facilitate deliberate consideration of the potential merits of reusing newly developed procurement instruments. If future reuse is considered beneficial, the procedure also describes how this can be facilitated. The case concerns the procurement instrument for performing market consultations. The overarching objective of the procedures for sub questions D and E is to provide the context for routine development (Cacciatori 2012). The research ambition is thus to create procedures that facilitate future achievement of the desired situation. This desired situation is achieved when the corresponding routines have become well-established in the client's procurement department.

1.8 Thesis outline

The chapters of this thesis are set up according to the structure described in the previous section. **Chapter 2** presents the case study on project alliancing that delivers the first set of evidence that the development of procurement instruments can be lacking higher purpose.

The desired situation is envisaged in the next two chapters. **Chapter 3** proposes conceptualizations of the procurement instrument management processes on the one hand, and the reasoning of procurement officials on the other. **Chapter 4** develops a conceptual model that

tailors the general concept of strategic alignment to the context of procurement instruments. Both chapters present case studies that illustrate practical application of the models.

Chapter 5 demonstrates that the step from *reconstructing* (as presented in chapters 2 – 4) to *creating* strategic alignment in real life can be made. It presents a case study in which interventions are made during an ongoing procurement instrument development process. As a result, this case study leads to a procedure design for the development process.

The series of studies is completed by **Chapter 6.** This chapter links the development of new procurement instruments to the general exploitation of instruments. It presents a procedure design to facilitate this link.

Chapter 7 provides the syntheses over the previous chapters. It illustrates how the results of the various case studies consistently point at implicitly and organically evolving procurement instruments (the current situation or IST), how the purposeful management of procurement instruments is envisaged in this study (the desired situation or SOLL), and which procedures this research has developed to help achieve this desired situation (HOW TO).

Chapter 8 presents the major conclusions of this research project and discusses its academic and managerial contributions. The main point is that deliberate explication of implicit reasoning is key to achieving purposeful management of procurement instruments. Without explication of reasoning, it is impossible to rationally assess the alignment between procurement instruments and the client's strategic goals, and thus to deliberately create purpose in the development and reuse of new procurement instruments. Figure 3 illustrates the outline of the thesis.

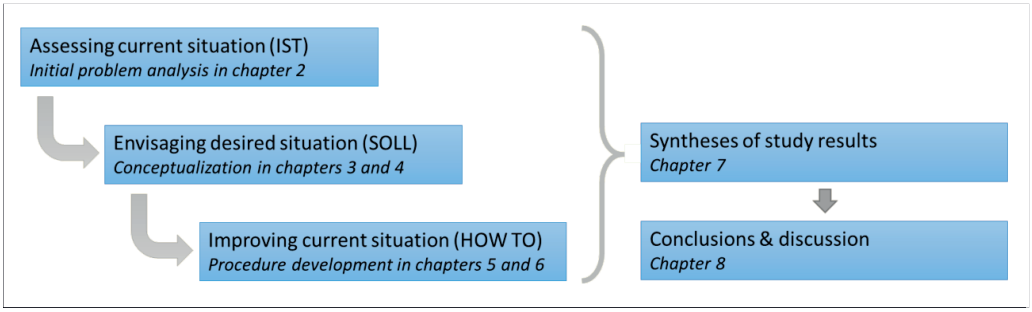

Figure 3: Thesis outline

Chapter 2

Procurement strategy formation: (re-)designing rail infrastructure project alliances

Abstract[1]

Purpose *– To provide insights into the reasoning behind the development of new procurement approaches by public sector clients.*

Design/methodology/approach *– A case study approach focusses on a procurement development process by a public sector client. It investigates the reasoning behind various applications of the project alliancing concept in rail infrastructure projects over a period of fifteen years. Alliancing applications are singled out and mapped against a number of criteria derived from literature on alliancing. The reasoning behind these applications and their differences are reconstructed from contextual documentation. Theories and concepts from the fields of strategic management and knowledge management literature are used to analyse the results.*

Findings *– The development process seems to be evolutionary rather than deliberately planned. The uncovered variations in alliancing applications can only to a very limited extent be explained by the reconstructed reasoning. This suggests that the applied designs are mostly based on implicit reasoning by individual project teams. From a strategic management perspective, the development pattern resembles the emergent type of strategy formation.*

Originality/value *– This study offers an initial insight into the reasoning processes behind the (re-)design of procurement approaches within a public sector client organization. A unique feature of this study is that these reasoning processes are explored from the strategy formation perspective that conceptually links the design of new procurement approaches to strategic management theory.*

Keywords: project alliancing, public procurement, strategy formation, strategic management, knowledge management.

2.1 Introduction

Governments have been increasingly outsourcing public service provision to the private sector (Alonso *et al.*, 2013). At the same time, public sector organizations are expected to achieve high performance standards in public service provision (Boyne and Walker, 2010). Therefore, procurement is becoming a strategic issue.

For public clients in the construction industry, the approach to procurement has changed significantly over the last two decades. Since the move away from traditional procurement (Egan, 1998; Latham, 1994), a range of alternatives has developed including Design&Build,

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Design-Build-Maintain, Private Finance Initiative, Partnering and Project Alliancing (Walker and Hampson, 2003). Such alternatives are commonly referred to as 'project delivery systems'.

Based on the view that there is no 'one size fits all' approach to procurement, public clients are currently advised to consider which alternative best matches the needs of each project (see, for example, reports issued in the United Kingdom (Treasury, 2013), the Netherlands (Jansen, 2009) and Sweden (Eriksson and Hane, 2014)). Given the potential impact of procurement on public performance, it is not surprising that the issue of selecting the most appropriate project delivery system has received considerable attention in the construction management literature (see for an overview Love *et al.*, 2012).

The process of selecting the most appropriate project delivery system may lead to a public client concluding that it should use a system that it has not used before. Such a conclusion has practical implications. Project delivery systems, such as those mentioned above, are abstractions of procurement practice. To actually apply a project delivery system, public clients have to operationalize the conceptual project delivery system into a concrete set of contracting documents and tendering procedures. Public clients may follow one of three routes in achieving this. The first is to apply generally acknowledged standards, such as the internationally applied FIDIC suite of contracts provided by the international federation of consulting engineers (Bunni, 2013) or national standards such as the NEC3 Engineering and Construction Contract (Eggleston, 2015) used in the UK. However, simply applying a general standard might not be the best solution. A client's particular context may require modifications to the standard, for instance because of national laws or client-specific processes. Moreover, public clients who frequently procure may prefer to maintain a set of bespoke procurement documents. As such, the second route is to 'adopt and adapt' a general standard. An example is the procurement practices of Network Rail, the UK's rail infrastructure manager, that maintains its own standard suite of contracts (which are publicly accessible on the internet). These include amendments to the UK's general 'Infrastructure Conditions of Contract (ICC)'. For example, in operationalizing the Design & Build concept, Network Rail's 'NR9' document contains amendments to the 'ICC Design and Construct Version'. Finally, public clients could build on their own procurement practices, or even start from scratch. This is the third route to establishing a project delivery system. More so than the second route, this route involves a procurement development process in which a procurement approach is designed and then applied in practice, and perhaps subsequently redesigned.

The pursuit of higher performance through improved procurement may drive public clients to embark on procurement development processes. Such a choice involves a trade-off. On the one hand, there are the expectations of outperforming current best practices but, on the other, there are the additional costs and risks inherent to development. A trade-off may be made for one particular project, and thus result in a bespoke procurement approach. Clearly, if the developed procurement approach proves successful in that particular project, or at least appears to have sufficient potential for further development and application in similar projects, the payoff from

the development will be higher. Consequently, the potential to reuse newly developed procurement approaches is an important issue for public clients.

Clearly, to benefit from previous procurement developments in future projects, the knowledge created has to be available for further applications. This has proved problematic: despite the many efforts made in practice and in research to improve learning from projects, progress still appears to be slight (Hartmann and Dorée, 2015). One of the impediments concerns the transfer of knowledge regarding the choices made in the procurement design. What problems was the development meant to overcome? What was the expected additional value compared to current best practice? Did it meet these expectations? In so far as such questions are considered in the procurement design phase, some of the associated reasoning may later prove to be irretrievable to the organization due to knowledge transfer impediments. As a consequence, appropriate application in future projects and guidance for further development efforts are endangered. This runs the risk that developments are used only once, mistakes are repeated and opportunities missed. This leads to unnecessary costs for both the client and the private contractors involved. How can such negative consequences be avoided?

The aim of this study has been to help public clients improve procurement development processes. As such, it primarily explores the nature of the reasoning processes behind the design of new procurement approaches from the theoretical perspective of strategy formation (Mintzberg *et al.*, 2005) in combination with distinguishing between implicit and explicit knowledge (Polanyi, 1966). The expectation is that, by adopting these perspectives, insights into the reasoning process behind the development of procurement approaches will emerge that will enable public clients to better manage developments.

This paper reports on a case study into a range of developments initiated by a public sector infrastructure manager. These concern the reconstruction over a period of fifteen years of applications of the same procurement concept: Project Alliancing. The first step was to assess whether the design of successive applications involved significant changes. The next step was to uncover the reasoning that could explain these differences. In so doing, insights emerge into the proportion of explicitly documented reasoning as against implicit reasoning during the development processes. This helps assess the relevance of managing the implicit/explicit balance since the latter is expected to contribute to a more deliberate approach to procurement development processes.

The implications of the findings from this research will hopefully stimulate both scholars and practitioners to further investigate the design, or redesign, of procurement approaches. This is important, for public sector clients, their contractors and for society, in achieving higher overall public performance through procurement.

2.2 Linking procurement to strategy formation and implicit/explicit knowledge

As outlined above, this study explores the nature of the reasoning processes behind the design of new procurement approaches from theoretical perspectives of strategic management and

knowledge management literature. This theoretical section explains the connection between these fields of literature.

Given procurement's potential impact on performance, for example in terms of 'value for money', many methods have been proposed for determining the most appropriate project delivery system (Love *et al.*, 2012). In this study, this is referred to as the 'selection process', but only if the public client already has concrete procurement documents, tender procedures, tools and methods necessary for using the selected project delivery system available. If not, then the development process discussed above will be needed. With both the 'adopt and adapt' and the 'self-development' approaches, a '(re-)design process' will form an adjunct to the selection process.

It seems reasonable to view both the selection and the (re-)design processes from the perspective of strategic management. Three reasons support this proposition. First, both processes should be managed strategically. Bryson (2010, p. 256) describes public sector strategic management as "the appropriate and reasonable integration of strategic planning and implementation across an organization (or other entity) in an ongoing way to enhance the fulfilment of mission, meeting of mandates, continuous learning, and sustained creation of public value". The last element in this definition can be significantly affected by the selection and (re-)design processes since "a 'one-size-fits-all' approach to procurement is unwise" (Walker and Rowlinson, 2008, p. 41). It follows therefore that both processes fall within the strategic management domain. Second, the reasoning used in the selection and (re-)design processes directly concern the objective of the strategic planning process: "clarifying organizational purposes and the requirements and likely strategies for success" (Bryson, 2010, p. 257). Third, it is argued that strategic management is increasingly important for shaping the performance of public organizations (Andrews *et al.*, 2012). Therefore, similar to what has been argued in the private sector purchasing and supply management literature (Weele and Raaij, 2014), research on public procurement should benefit from strategic management theory and concepts.

The focus of this paper is on the (re-)design process, and in particular on the reasoning used in this process. What reasons are used in a public sector organization to explain the design or redesign of a particular project delivery method? How can this reasoning process be qualified from a strategic management perspective? To our knowledge, these questions have not yet been addressed in the literature. In this study, the reasoning process is primarily explored from the theoretical perspective of strategy formation (Mintzberg *et al.*, 2005). These authors discerned ten distinct schools of thought regarding the process of strategy formation, and argued that each has its advantages and its drawbacks. As such, analysing the reasoning behind the development process in terms of this framework should help in better understanding the nature of this process. Subsequently, it could enable public clients to deliberately choose and manage a particular strategy formation perspective in future procurement developments.

This study also establishes a link between procurement and the knowledge management literature. Central to knowledge management is the distinction between tacit and explicit

knowledge (Ragab and Arisha, 2013), a distinction first proposed by Polanyi (1966). Explicit knowledge is knowledge that can be codified and stored, whereas tacit knowledge cannot. Viewing tacit and explicit knowledge as the two ends of a continuum (Nonaka and von Krogh, 2009), rather than as a dichotomy, introduces the possibility of less tacit or less explicit forms of knowledge. Clearly, the extent to which knowledge remains tacit, or implicit, is a factor in knowledge transfer. Although only limited literature addresses this subject in the specific context of public procurement, there are indications as to the ways in which non-explicit knowledge can be problematic for agencies. A study by Hazlett *et al.* (2008) reported various causes of errors and mistakes including a lack of understanding of the contract documentation (including historical knowledge), misunderstandings or ignorance over implementing measurements, no clear understanding of the role of the engineer within the contract, and staff simply working in the same way as they always had.

Finally, there are sound reasons for combining strategic management and knowledge management perspectives. It has been argued that future strategic management research needs to be directed, amongst other things, at, "… the structuring and facilitation of organizational learning and knowledge management as integral part of strategic management" (Bryson *et al.*, 2010, p. 506).

To conclude, it seems reasonable to expect both strategic management and knowledge management literature streams to provide theories and concepts that can contribute to better understanding the development process of procurement approaches.

2.3 Research context: the procurement concept of project alliancing

Project alliancing is a relatively new method for construction project delivery. An offshore project in the North Sea, initiated by British Petroleum, is commonly considered to be the first application of alliancing (e.g. Bakshi, 1995; Halman and Braks, 1999). Scheublin (2001), focussing mainly on the petrochemical sector, was the first to describe project alliances in the Netherlands. In the Dutch public infrastructure sector, the first project alliance was initiated by ProRail, the Netherlands railway agency, in 1998. Since then, project alliancing in infrastructure projects has been much debated in the Netherlands, but there have been few implementations. Of the Dutch public sector agencies, ProRail appears to be the most frequent user of project alliancing forms, albeit to a far lesser degree than their default mode of procuring infrastructure projects in the Design & Build form.

Since the initial project in 1998, ProRail has implemented several procurement approaches that are alluded to as 'alliances'. One of these has been reported in the international scientific literature (Laan *et al.*, 2011). Although some of the other alliances have gained local media attention, they have remained largely unobserved, even within large parts of the ProRail organization. At the start of this study, the prevailing view in the procurement department was that ProRail did occasionally apply project alliances, that some were seen as a great success, and that they were not all alike. However, a deep understanding was limited to a few people, some of whom were no longer with the organization.

Not only within ProRail, but also in the scientific literature, alliances and alliancing are not clear-cut concepts. Several authors warn over possible confusion regarding the interpretation (Yeung *et al.*, 2007; Chen *et al.*, 2012). Further, Lahdenperä (2012) observed that concepts such as project alliancing are not stable and develop over time through interactions with other project delivery methods, and that this is likely to continue in the future. As such, the meaning attached to the term 'alliance' in this study should be explained.

Walker and Lloyd-Walker (2015, p. 29) discuss three forms of alliancing that cover both capital expenditure projects and maintenance and operations activities: project alliances, design alliances and programme service alliances. In this study, design alliances are ignored since the description offered seems to reflect a specific Australian context. Further, since the investigation into ProRail's applications of alliancing only concern capital expenditure projects, programme service alliances are also out of scope. This narrows our use of the concept of alliancing down to variations within the 'project alliance' form in which 'a project alliance is generally formed for a single project, after which the team is usually disbanded' (Wood and Duffield, 2009). From the range of high-level descriptions of project alliancing, the description provided by the State of Victoria's Department of Finance and Treasury fits well with the ProRail context: " a method of procuring (and sometimes managing) major capital assets, where a state agency (the Owner) works collaboratively with private sector parties (Non-Owner Participants or NOPs)" (Victoria, 2010). Consequently, this description serves as the high-level definition of a project alliance for the purposes of this study.

2.4 Research approach

The aim of this study is to help public clients carry out deliberately planned procurement development processes. To our knowledge, this development process is scarcely addressed in the literature. Therefore, as a start, an initial insight into a public client's development process needs to be established. *How can this development process be characterized?*

Given this aim, the literature recommends case study research. According to Yin (2014, p. 10), such 'how' questions deal with "operational links, needing to be traced over time, rather than mere frequencies or incidence". Such questions are likely to encourage the use of experiments, histories or case studies (Yin, 2014). Experiments can be performed when an investigator is able to manipulate behaviour directly, precisely and systematically. However, these conditions are not met in our research context. Histories are the preferred method when there is virtually no control over, or access to, behavioural events. However, this study is not restricted to 'the dead past' because some of the people involved in the events could be interviewed. Moreover, since "a case study's unique strength is its ability to deal with a full variety of evidence – documents, artefacts, interviews and observations – beyond what might be available in a conventional historical study" (Yin, 2014, p. 12) this method is preferable to a history.

Further, Yin defines case study research as "an empirical inquiry that investigates a contemporary phenomenon (the "case") in depth and within its real-world context, especially

when the boundaries between phenomenon and context may not be clearly evident" (Yin, 2014, p.16). The elements in this definition are present in our situation since we:

- can inquire into the contemporary empirical context of a public sector client;
- can investigate the reasoning processes behind the applications of the project alliancing concept;
- can investigate these in depth and within the real-world context of the people operating these instruments;
- cannot clearly establish evident boundaries between the phenomenon of these reasoning processes and the context in which they take place.

ProRail's range of alliancing applications seems to provide a relevant case for investigating procurement development processes for a number of reasons. First, the project alliancing applications appear to concern bespoke designs for single projects. Evidently, for these contracts, a (re-)design process has been carried out. Second, this case appears somewhat paradoxical at first sight. On the one hand, project alliancing is promoted by both the client and the involved private companies as a very successful method, i.e. outperforming the best practice alternative. On the other hand, the number of alliancing applications is relatively low compared to other project delivery methods applied by the client for similar projects. This raises questions about the processes of strategy formation and implementation in the client's organization. What strategy lies behind this high success but low take-up? Third, at the start of this study, there was a general perception of ambiguity in the client organization regarding the main features of each of the project alliancing applications. Were there differences between the applications best known within the organization and, if so, why? Is the distinction between project alliances and the more common Design & Construct contracts merely having an incentive mechanism added to the former?

This study set out to establish a factual basis on which one could verify the initial assumptions regarding the project alliancing development process. This involves: (1) isolating project alliances from all the other procurement approaches applied in the client's projects; (2) mapping variations in the applications of the project alliance concept; and (3) investigating whether the motives for these variations were explicitly stated in project documents. The study covers the period from 1998 to July 2013.

2.4.1 Step 1 – Singling out project alliances

How can one identify and single out projects that can be regarded as project alliances? In order to identify alliances among the thousands of projects ProRail undertook between 1998 and 2012, selection criteria are needed, and the literature offers some suggestions. Yeung *et al.* (2007) distinguish 'soft (relationship-based) elements' and 'hard (contractual) elements'. Soft elements include trust, long-term commitment, and cooperation and communication. Such soft elements are disregarded in this study since selecting contracts based on these criteria would require a subtle set of criteria for objective decision-making, which is not available, if it was not to be somewhat arbitrary. Moreover, by their nature, these constitute the 'hoped-for' results of a project alliance and, as such, cannot be fully created by the contract alone (Bresnen and

Marshall, 2000). Hard elements include the 'formal contract' and the 'real gain/pain share' (Yeung *et al.*, 2007).

Addressing the hard elements, the 'formal contract' is viewed in this study as providing evidence of the existence of an alliancing arrangement between companies in the form of a signed contract; and genuine sharing of pain and gain is the key criterion. However, a literature search indicates a lack of a general consensus on the precise meaning of 'real gain/pain share', although a compensation model derived from Australian practice is considered typical (Love *et al.*, 2010). The present study considers a compensation element to reflect the project alliance form provided (a) the client and other participants have signed a contractual arrangement that (b) in some way relates to over- or under- run of targeted outturn costs. As such, the pain/gain-sharing mechanism is the main determiner in identifying projects delivered through an alliance method.

2.4.2 Step 2 – Mapping variations within the concept of project alliancing

How can the development of the project alliance method be observed and assessed? Alongside a time reference, this requires an ability to identify differences among the alliance projects. Here, six basic characteristics were chosen to differentiate in terms of context: (1) contract value, (2) technical scope, (3) type of contract tendered, (4) type of alliance partner, (5) time to the alliance agreement being signed after awarding the tendered contract and (6) differences relative to the contract used in project #1.

Next to these basic characteristics, three specific alliancing characteristics were considered: (7) activity domain, (8) risk domain and (9) alliance management arrangement. These items elaborate on the 'real gain/pain share' aspect discussed above. The logic for using these three characteristics is as follows. The majority of project alliance definitions emphasize 'collaboration' as key to achieving high performance. This collaboration is primarily stimulated by aligning objectives (Love *et al.*, 2010), and this is established through the gain and pain sharing arrangements. In contracts, pain/gain sharing can be directed towards specifically recognized shared project activities and/or risks, and it is not practical to include all activities and risks involved in a project. As such, some domain boundaries must be set in the contract (such as the risk that the client introduces a major change in the scope). This also applies to activities (such as those needed to convert the client's formal decision to commission a project into the tender dossier subsequently prepared by the client). Consequently, the size of the domain covered by the pain/gain mechanism in a project alliance is a design issue and thus can be used to identify differences between alliancing applications. This set of activities and risks will be referred to as 'the shared domain'.

Further, the creation of a shared domain suggests the need for an organization, or at least some procedures, to manage that domain. The State of Victoria's 'Practitioners Guide' proposes an Alliance Leadership Team (ALT) and an Alliance Management Team (AMT) to manage the shared domain (State of Victoria, 2010). However, the need to have certain officials involved in these teams, or even to have such teams at all, may be interpreted differently. In specific cases, the

shared domain may be so small that the supposed roles of the ALT and AMT are scaled back to domain management by a single Alliance Manager (AM), or even to just a set of procedures.

Based on the above, the area to which the pain and gain sharing element is applied can be differentiated in terms of the following aspects:

- domain of shared activities (broad / narrow / not applicable);
- domain of shared risk (broad / narrow / not applicable);
- management arrangement (ALT, AMT, AM, procedures only).

2.4.3 Step 3 – Identifying explicit reasoning

Assuming that there are distinct variations in the application of project alliancing, what are the motives and expectations that drove this differentiation? Can the motivations and expectations be found in ProRail documentation? To answer these questions, project-related documents, including contracting plans, tendering board minutes, contracts and policy documents, were reviewed alongside less formal documents such as PowerPoint presentations. For some of the projects reviewed, internal evaluation documents were available that included reports on interviews with key players. Some of these interviews took place prior to this study, and others were concurrent but were not initiated by this study.

To facilitate categorizing the motivations found in the ProRail documentation, a list of possible motivations was derived from relevant literature. In their overview of alliancing research, Chen *et al.* (2012) distinguished between 'motivations to use alliancing', 'alliancing benefits' and 'the applicability of alliancing'. However, to avoid a too narrow definition, in this study each of these is seen as a potential motive for forming a project alliance.

2.5 Results

Outcomes of Steps 1 and 2

Based on the pain/gain sharing criterion, the initial scan identified eight projects that could be interpreted as project alliances. Two of these projects encapsulated multiple project alliances, with project #3 containing three separate project alliances and #6 two. The eight projects were mapped in terms of the alliance characteristics developed in Step 2. Table 1 on the next page shows the results of these two steps.

Table 1: Results of Steps 1 and 2

Project	#1:	#2:	#3:	#4:	#5:	#6:	#7:	#8:
Start Year	1998	2005	2005	2006	2008	2009	2011	2012
Value (€ million)	>100	25-50	<25	>100	>100	>100	25-50	<25
Technical scope	civil works	civil works	instal-lation	civil works	civil & railinfra works	civil & railinfra works	civil works	civil works
Contract tendered[1)]	DC&M	D&C	D	D&C	D&C	PA	D&C	D&C
Type of party[2)]	CC	CC	EF	CC	CC	CC	CC	CC
Agreement on alliance contract[3)]	<4 months	<5 months	<9 months	<9 months	<4 months	-	-	-
Changes to reference contract[4)]	ref.	minor	major	new contract	new contract	major	new contract	new contract
Activity domain[5)]	broad	broad	broad	narrow	-	broad	-	-
Risk domain[5)]	broad	broad	broad	narrow	narrow	broad	narrow	narrow
Management arrangement[6)]	ALT & AMT	ALT & AMT	ALT & AMT	ALT & AM	-	ALT & AMT	-	-

[1)] D = Design, D&C = Design & Construct, DC&M = Design, Construct & Maintain, PA = Project Alliance

[2)] CC = consortium of contractors, EF =engineering firm

[3)] Time taken to agree an alliance contract after awarding the tendered contract. '-' indicates that the alliance contract was not preceded by another contract.

[4)] ref. = the reference contract to which later contracts are compared.

[5)] '-' = not present in this contract

[6)] ALT = Alliance Leadership Team, AMT = Alliance Management Team, AM = Alliance Manager

Project #1 was the first project alliance and serves as a reference for comparison in terms of several aspects. First, the 'changes to reference contract' aspect illustrates how alliancing applications have developed over time. This aspect addresses the question as to whether later contracts were largely based on the first one (i.e. only minor changes), or whether some clauses were reused and new ones introduced (major changes), or whether none of the clauses first used seem to be reflected in a later application (a new contract). Second, both the activity and risk domain of project #1 serve as a reference. Evidently, the classifications of these domains are coarsely scaled. Domains significantly larger than those of project #1 have not been encountered. Therefore, if later projects have domains more or less similar to those of project #1, then these are classified as 'broad'. The classification 'narrow' implies that domains are significantly smaller. If there is no shared activity or risk in the contract, the domain is marked with a '-'.

Project #4 has a striking feature in its domain management arrangement. Here, the domain is managed by an Alliance Leadership Team, without having an Alliance Management Team. Although the role of Alliance Manager is incorporated in the contract, this has been a purely advisory role without any mandates.

Projects #6, 7 and 8 were directly tendered as a project alliance. This is a striking change, since in previous projects an indirect approach to project alliancing was followed. There, the agreement on the alliance contract was the result of negotiations between client and contractor in the contractual phase of (in most projects) a Design & Build contract. So even if the intention to create a project alliance later on was stated in the tender documents, the object of the tender procedure was not an alliance contract. In contrast, from project #6 onwards, the direct outcome of the tender procedure is an alliance contract signed by both parties.

The 'changes to reference contract' row indicates that four contracts were 'new', meaning that these contracts had hardly any similarities with project #1, or even with any other previous contract. In these cases, the (re-)design process, as introduced in this article, was apparently initiated. The 'major' changes seen relative to previous contracts also suggest substantial redesign efforts.

To summarize, Table 1 shows that some of the later applications of the project alliancing concept are strikingly different from earlier ones in terms of several aspects, although almost all are applied in the same civil works and rail infrastructure sector. This significant diversity in applications shows that alliancing is seen as a 'one-off' application: that the project in question needs a contract tailored to its particular challenges. This thought is further supported by the relatively few project alliances that have been initiated in the fifteen-year period, especially when considering the successes claimed for some of the applications.

Outcomes of Step 3

On the next page, Table 2 shows the results of Step 3. As in Table 1, the columns represent the eight selected projects and, this time, the rows contain the possible motives as derived from the literature on project alliancing. Where a particular motive was identified in the ProRail documentation, this is shown by a '✓' at the row/column intersection. Where no explicit motivations were found for a different design to project #1, or even any previous application, this is indicated by 'not found' in the 'explicit motivations for alliance change' row.

Table 2: Results of Step 3

Explicit motivations for alliance initiative:	#1:	#2:	#3:	#4:	#5:	#6:	#7:	#8:
Cost reduction	✓	✓	✓	✓	-	-	-	-
Tight time constraint	✓	-	-	-	-	-	-	-
Flexibility in development	-	-	-	-	-	-	-	✓
High quality	-	-	-	-	-	-	-	-
Innovation required	-	-	-	-	-	-	-	-
Earlier commencement	-	-	-	-	-	✓	-	-
Economizing on resources	-	-	-	-	-	-	-	-
Source of learning	-	-	-	-	-	-	-	-
Enhancing reputation	-	-	-	-	-	-	-	-
Improving competitive advantage	-	-	-	-	-	-	-	-
Dispute avoidance	-	-	-	✓	-	-	-	-
Improving non-cost outcomes	-	-	-	-	-	-	-	-
Project complexity	-	-	-	-	-	✓	-	-
High risks	✓	-	-	-	✓	✓	-	-
Complex stakeholder issues	-	✓	✓	-	-	✓	-	-
Complex external threats	-	-	-	-	-	-	-	-
Other …	-	-	-	✓a	-	-	-	-
Explicit motivations for changing alliance form:	NA	Not found	✓b	Not found	Not found	✓c	Not found	Not found

a) Stimulate cooperation over seven specific problem areas
b) No added value for contractor as participant in the alliance
c) To allow for directly tendering a project alliance; to maximize the alliance domain.

Often, the motives in Table 2 are too briefly stated to clearly convey a meaning. However, the alliancing literature is also often vague about the precise meanings of these motives. In this study, motives found in the documentation were mapped onto the researchers' interpretation of motives derived from the literature. For instance, 'cost reduction' is marked with a '✓' if, in a contracting plan, there was the expectation that the alliancing approach would reduce costs below the other options being considered. There has been no attempt to categorize where the cost reductions were targeted. Similarly the presence of a 'tight time constraint' is indicated where documents stated that the project has limited time available, such as for carrying out the tendering procedure, for the spatial planning process, or for the execution of the works by the contractor.

Table 2 shows that the motivations for an alliance initiative or alliance variation are rarely explicitly provided in documents. This indicates that both the reasoning behind applying a project alliance approach and subsequently for entering the (re-)design process have largely remained implicit. The very limited motivation to be found in formal documents suggests that

the reasoning behind the (re-)design of variants mostly occurs at the level of single project teams. Insofar as the reasoning is the result of discussions in project teams and in the organization's hierarchy, it remains largely implicit. This suggests that, for the transfer of knowledge regarding the reasoning behind the various designs, the client organization primarily relies on staff knowing who to ask, rather than where to look, for information.

Given the limited number of applications together with the high levels of variation and implicit reasoning, the results show that progress in the development of this procurement approach has been evolutionary rather than deliberately planned.

Other relevant results

In going through Steps 1 - 3, the case study also yielded a result that was not linked to any specific project. This concerns the fact that, at the end of 2011, ProRail decided to incorporate project alliancing in its general procurement policy for construction projects. For some projects this policy contributed to an intention to implement project alliancing but, for various reasons, these alliances were not established.

Two distinct logics for the shared domain

The perception of the (re-)design process being invoked for a single use may suggest that there are no trends in the development. However, Table 1 shows that specific procedures and the organizational forms used to manage the shared domain become less elaborate as the size of the shared domain decreases. Over time, the frequency of applying alliancing in projects seems to have grown while the size of the shared domain has reduced. If this is a genuine trend, then there must be some reasoning that goes beyond the individual project level. What might that reasoning be?

Fortunately, some explicit motivation was uncovered that might explain the trend. This was supported by recollections of past discussions and other contingent evidence. The indication is that two conflicting logics may have emerged over time. To explain this, we return to the shared domain. In the alliancing literature, the 'real gain/pain share' mechanism is considered essential to the concept of project alliancing. This mechanism is thought to align interests and thus behaviour among project participants, and this is assumed to enhance project performance. In the current study, a formulation was found in the documents (project #6) that explicitly proclaims the extension of the pain/gain sharing domain to its "reasonable maximum". The argument underpinning this formulation follows the logic of interest alignment: the greater the shared domain, the fewer conflicts of interest to be expected. Conversely, there is evidence of an implicit preference for limiting the shared domain to that "considered strictly necessary". The latter is demonstrated in the move towards sharing only specific risks (projects #4, 5, 7 and 8). A logic for this standpoint was not found in the documentation but it seems to be driven by defence and risk avoidance. A reconstruction of this shifting logic suggests that the reasoning was as follows:

- Transfer risks to the party that can best manage them, but:
- If that party has only limited influence on a specific risk, then the client will not benefit much from transferring that risk;
- In such situations, the risk may be more manageable if the client and the other party have a common interest in avoiding or managing that risk;
- A common interest is best stimulated by including pain/gain sharing arrangements.

To summarize, the results indicate that the reasoning behind the (re-)design process involves several layers of abstraction, i.e. motivations for applying a project alliance, motivations for doing this differently than before, and basic logics regarding the effectiveness of an alliance design. The results indicate that this third layer 'design logic' involves two distinct logics for the shared domain.

2.6 Discussion

The aim of this study has been to help public clients improve the contribution that procurement makes to performance with the focus on procurement development processes. The first step is to provide insights in the procurement development process. How do the results contribute to understanding this process? In this discussion, we start by interpreting the results from perspectives offered in two fields of literature: (1) strategic management and (2) knowledge management. For each of these we discuss two rival explanations (Yin, 2014) and suggest implications to help public clients improve the procurement development process. In addition, directions for future research are provided.

1a) The strategic management perspective: emergent strategies

The results indicate that progress in the development of the alliancing procurement approach has been somewhat evolutionary rather than deliberately planned. As such, this pattern in procurement development raises questions about the *overall* strategy in applying the concept of project alliancing. Here, the overall strategy refers to the alliancing development process over a range of projects, as opposed to the procurement strategy formed for a single project. How can this alliancing development process be understood from the perspective of strategic management?

One of the central concepts within the strategic management literature concerns strategy formation. Mintzberg *et al.* (2005) discern ten schools of thought on the strategy process and argue that each view has its limitations and potential contributions. In addition, Mintzberg *et al.* (2005) also discerned five different meanings that can be attached to the word strategy ("the five Ps for strategy": plan, pattern, position, perspective and ploy). Here we consider the 'pattern' of strategies: strategies can be intended, deliberately carried out or emerge and, eventually, proven to have been realized or not. By investigating the past using this set of distinctions, one may uncover a certain strategy pattern.

In this case study, the pattern seen in the development process reflects the learning school of thought. This school views strategy formation as an emergent process (Mintzberg *et al.*, 2005). In the public sector, as in the private sector, emergent strategies "… are grounded in the practice

of staff, rather than planned by top managers. They are adopted implicitly, often unseen …" (Bovaird and Löffler, 2009, p. 74). Three reasons support this conclusion.

First, for most of the fifteen-year period, there has not been a procurement policy that supported the use of alliancing. As such, an explicit alliancing strategy had not been decreed by top management. This situation is typical of emergent strategies, where the pattern realized was not expressly intended. Second, in the client's organization, procurement strategies are devised for specific projects or programmes. This task is assigned to an organization-level procurement officer who is expected to develop a strategy through interacting with the project team. Since there was no explicit alliancing strategy, there must have been an implicit strategy to apply alliancing principles in particular cases. This strategy has emerged over time, with it taking over ten years for project alliancing to become part of general procurement policy. Third, although the alliancing procurement policy adopted the logic of maximizing the shared domain in project #6, both projects #7 and #8 diverge from this policy by seeking to minimize the shared domains. In seems therefore that rather than pursuing a plan to diversify, decisions to diversify were made on a one-off basis. In this way, both before and after the alliancing procurement policy was formed, a pattern of strategy diversification emerged.

To conclude, the emergent strategy perspective may explain the evolutionary alliancing development process. Since this perspective is an explanatory framework in this case study, other perspectives may be applicable in other cases. The implication for public clients is that they should try to match procurement development processes to one of these perspectives. This would help a public client to increase its understanding of (a) the potential advantages and disadvantages of the strategy formation process followed and (b) potential alternatives to this process, and thus (c) to make more deliberate choices in future procurement development processes.

Future research should support public clients by further investigating the implications of the schools of thought in the particular context of the procurement development process. This will probably result in a set of directions that enable public clients to manage this process more deliberately.

1b) The strategic management perspective: Miles and Snow framework

The results may also be interpreted through another strategic management perspective. If the evolutionary development process were representative for the client's overall conduct in procurement, how would that contribute to the understanding of the development process?

One of the prominent frameworks in the literature on the private sector is the Miles and Snow typology of prospector, defender, analyser and reactor (Miles *et al.*, 1978). Private sector evidence suggests that prospectors outperform defenders and analysers, who in turn outperform reactors (Meier *et al.*, 2007). This framework has also been modified for use in the context of public organizations (Boyne and Walker, 2004). However, here there does not seem to be a clear overall success hierarchy of the strategy types (Andrews *et al.*, 2006; Meier *et al.*, 2007; Bryson *et al.*, 2010). Moreover, organizations are likely to pursue a mix of strategies (Boyne

and Walker, 2004; Andrews *et al.*, 2012;) Nevertheless, the idea of researching the procurement development process from the perspective of this framework is attractive. Public clients who are innovative in the procurement field might be considered as taking the prospector stance. Will such public clients achieve higher performance than those adopting a defender stance, i.e. clients that seek to optimize their set of frequently used procurement approaches? Support for this standpoint may result in an implicit overall strategy of the procurement department that stimulates procurement developments, perhaps to the extreme that each project deserves a tailor-made contract. Therefore, the presence of a prospector strategy may help explain the evolutionary development process. This implies that public clients striving to manage the development process more deliberately should investigate the procurement department's general conviction regarding the different stances.

We note that the prospector strategy explanation can also be considered as a combination of Mintzberg's typology of strategic thinking (Mintzberg *et al.*, 2005) with the Miles and Snow typology (Miles *et al.*, 1978), since this throws up a similar question: could it be that public clients that apply a learning school perspective foster a creative procurement environment that subsequently enables them to achieve the prospector stance? Evidently, investigating such questions is beyond the scope of this paper. Future research may help the prospecting type of public clients to steer procurement developments between the extremes of "rational deliberateness" and "the very disintegration of strategy" (Mintzberg *et al.*, 2005).

Finally, an interesting alternative could be to apply the Miles and Snow typology on an individual level instead of the organizational level mentioned above, i.e. to classify the people involved in the procurement development process in terms of this typology. This may help public clients to focus on, or deliberately create, situations in which argumentation is made explicit, since discussions between prospectors, defenders, analysers or reactors on procurement developments will force reasoning to become explicit. Future research may bring this line of thought further and provide public clients with concrete tools.

2a) The knowledge management perspective; KMS strategies

The fact that the alliancing contracts used in projects #1, 2, and 6 are similar on most aspects shows that at least some knowledge has been reused. As noted in the introduction section, achieving an effective transfer of knowledge can be complicated in project-based organizations. Therefore, we hypothesize that the extent to which alliancing knowledge during the evolution of alliancing applications is transferred may influence the procurement development process. How can the client's knowledge management practice in this case study be characterized?

We approach this question from a perspective seen in the general knowledge management (KM) literature. There, the term Knowledge Management System (KMS) is used to allude to the ways in which an organization supports its KM efforts. A KMS has been described as a configuration of managerial, technical and organizational systems that is structured to support the implementation of KM within an organization (Massa and Testa, 2009). Three main approaches to establishing a KMS have been identified: codification, personalization and people finder

(Ragab and Arisha, 2013). Codification is a 'people-to-documents' strategy and involves documenting and storing knowledge in order to enable access to this knowledge by other people and/or future applications. In contrast, personalization is a 'person-to-person' strategy that focusses on the transfer of knowledge through face-to-face social interactions. The people-finder strategy focusses on mapping the location of knowledge within the organization.

Earlier, it was already indicated that ProRail seems to primarily rely on staff knowing who to ask, rather than where to look, for information. Following the classification of KMS approaches, this is a person-to-person strategy. Although the study shows that some motivations are indeed documented and accessible in archives, it also found that the codification strategy is not actively applied when it comes to the (re-)design process. The same is true for the people-finder strategy: although such a strategy is facilitated by the intranet function in the client's organization, it is not actively applied in the (re-)design process. It seems therefore that the apparent limited effectiveness of the applied mix of KMS approaches may help explain the evolutionary pattern uncovered in the alliancing development process.

In conclusion, this perspective implies that public clients can work more consciously on the procurement development process by deliberately connecting it to KMS approaches. Easy access to knowledge (what, why and how) of previous applications will facilitate procurement officers to consider changes to previous applications more explicitly.

2b) The knowledge management perspective; knowledge taxonomies

Observing so much diversity in the applications in this case study, one wonders what knowledge inspired the (re-)design processes. Kakabadse *et al.* (2003, p. 78) show that "There are numerous definitions and taxonomies of knowledge that contribute to theory and praxis from a variety of perspectives." Therefore, in this case study, it is useful to consider the nature of the procurement knowledge that is applied in the development process. Here, we propose two opposite types of alliancing knowledge that may help explain the evolutionary alliancing development process.

Lahdenperä (2012) showed, on the macro-level, how the project alliancing concept has a history of travelling around the globe, evolving while interacting with other procurement approaches along the way. On the one hand, Lahdenperä (2012, p. 57) recognizes "project alliancing as a project delivery system in its own right" due to certain key features. On the other, Lahdenperä (2012, p. 74) also states that "any application is likely to be a highly specific combination of practices, manifesting itself in different ways and making it hard to generalize". This line of thought resembles the idea-construct of the 'pure type', as in Weber's sociology (Weber, 2009). A 'pure type' is formed from characteristics of the given phenomena, but it is not meant to correspond to all of the characteristics of any one particular case. Perhaps, similarly, the procurement designs were inspired by knowledge of project alliancing at the conceptual level of a 'pure type' delivery system. This may explain the variations in the translation of the concept into actual contracts. Procurement designers may have their own individual ideas on how to operationalize the concept. For instance, whether the procurement officer involved in the project at hand is a 'domain maximizer' or 'domain minimizer' may result in different designs.

Different individual-level opinions and theories regarding what constitutes the 'pure type' may thus drive the design process in different directions. Moreover, the (re-)design processes have been carried out in the context and dynamics of individual projects, as opposed to a (re-)design process executed independently of a project. Therefore, the procurement officer's perception of the particularities of the project at hand may also influence the operationalization of the pure type.

However, previous applications within the client's organization may also be the source of inspiration. Not in the sense of a 'pure type', but more as a concrete and practical tool that apparently worked in mitigating a particular issue. This seems likely since only a limited number of procurement officers worked on the designs - albeit sometimes unaware of other designs. Moreover, most of these officials had worked in the same department during the greater part of the fifteen-year period examined in this study. This suggests that these officials may have been able to quickly retrieve concrete contractual alliancing clauses used in particular projects since they knew what to look for and where in the archives. Once retrieved, the clauses could then be reused or altered with little effort. In this way, alliancing ideas may easily survive the duration of several projects, and might even be reused after a few years have passed.

The implication of this perspective is that public clients would benefit from identifying the source of inspiration in the (re-)design process, since both types of procurement knowledge arguably have advantages and drawbacks. For example, the 'practical tool' kind of procurement knowledge associates with a quick-fix approach, with the potential advantage of limited cost and time consequences, but the potential drawback of having a bad match to the rest of the contract. The 'pure type' procurement knowledge associates with the reverse: an expensive, time consuming but high quality 'from scratch' design process. Being aware of such pros and cons may help a public client manage the development process more deliberately. Future research could support public clients by analysing the (re-)design process from this knowledge-type perspective.

2.7 Research limitations

The exploratory character of this case study means that a number of research limitations need to be addressed. Given that we had to establish a method to identify project alliances from a large number of assorted contractual arrangements, we mainly focus on this aspect.

First, the selection criteria used in Step 1 led to eight projects that, at least at first glance, could be considered to be project alliances. However, the choice of 'formal contract' and 'real gain/pain share' as the selection criteria was somewhat crude and a bare minimum. People who had experienced working in a 'full' project alliance, such as in projects #1, 2, 3 and 6, might not see the other selected projects as alliances. They might easily view them as Design&Construct contracts with an additional incentive mechanism. As discussed earlier, the alliancing literature does offer several other potential criteria in the form of informal or non-contractual aspects such as trust and long-term commitment (Yeung *et al.*, 2007). Although it would be difficult to use these aspects as selection criteria, such criteria can, and probably should, be used as evaluation

criteria during a project. Further, the different logics used by the domain ‘maximizers’ and ‘restrictors’ suggest that the size of the shared domain should be developed into a third ‘hard’ criterion.

Second, while the selection method employed did identify alliance projects, it also excluded those projects in which a project alliance was (a) intended but where the attempt failed, or (b) considered but then rejected as the optimal delivery method. Studying such projects would be valuable in research aiming to uncover motivations and expectations. As such, the selection strategy employed in this study rejected relevant data and data sources leaving questions unanswered. Why was the implementation stopped in the project? Would there have been any new insights regarding the motivations, were there other circumstances that led to different reasoning processes?

Third, in Step 2, additional characteristics of the variations could also have been considered. Although the limited number used in this study was sufficient for confirming the initial assumption of there being differences among the alliance applications, considering a greater range of characteristics might have yielded further differences. Moreover, the distinctions, for example between narrow and broad, are rather crude. Refining the categories would yield a more detailed insight into the variations.

Fourth, in Step 3, a number of potential motivations for alliance projects were identified. The study of formal documents showed that the choices made regarding the alliance method were either apparently “different per project” or “seldom explicitly motivated in the documents”. This is indicative of the implicit nature of the reasoning in selecting a procurement method. More-extensive interviews with key players might have yielded more information and insight into the implicit side of the motives and expectations used in individual cases. This could lead to a fuller reconstruction of the reasoning. However, in this case study, interviews with key players were not held since reports of earlier such interviews were already available for some of the more recent projects. These included answers to questions that were specifically aimed at the reasoning process. Moreover, interviewing may not be as successful as one hopes due to selective memory and biased hindsight. Longitudinally observing project teams as they determine a delivery method might reveal a clearer picture of the logic and reasoning used.

Fifth, the 'standard' motivations derived from the literature could be further elaborated and sharpened. For instance, 'cost reduction' might be anticipated through several factors such as greater efficiency, fewer conflicts and better design optimization. Attributing documented project motivations to items on such an extended list would probably require less interpretation.

With regards to the discussion section, we note that this case study is establishing links between the procurement development process and the fields of strategic management and knowledge management literature. Evidently, the theoretical perspectives applied in this study concern only a selection out of a range of potentially interesting theories and concepts. Although some rival explanations are suggested in this study, other explanations may also contribute to carrying out procurement development processes more deliberately.

2.8 Conclusions and suggestions for further research

Since public clients depend more and more on outsourcing, procurement is becoming a strategic issue. To improve procurement's contribution to the client's overall performance, current procurement practices may require new developments. This paper contributes to the understanding of procurement development processes. It holds that, given the increasing role of public procurement, a proper understanding of the reasoning behind these development processes is key in improving procurement's impact.

This paper contributes to this understanding by offering an initial insight into the reasoning behind the (re-)design processes at the micro-level of a single public sector client. It reports on a case study that investigates the development of procurement approaches that can all be identified as variants of the 'project alliancing' delivery system. The paper first explains the strategy used to distinguish alliance projects from other project delivery systems. It introduces a rationale, based on a typology of the shared domain, for mapping variety among alliances, and hints at opposing logics regarding this shared domain. Practitioners considering alliancing as a project delivery system could use these results to reflect upon their motives and logics regarding the shared domain and pain/gain structures.

Next, shifting the focus from alliancing to the evolutionary development process encountered in this case study, the main contribution of the paper is in interpreting this finding from various theoretical perspectives. This paper primarily establishes a link between the development of procurement approaches and theories and concepts drawn from the strategic management and knowledge management literatures. Two prototype theories are offered to explain the evolutionary development process. In addition, two rival explanations are briefly outlined to trigger further reflection on the nature of the procurement development process. Both for researchers and practitioners, these perspectives provide a basis from which useful lessons can be drawn with regard to the management of procurement development processes.

The case study has only considered one particular procurement approach from a range of approaches applied within the single public client. This is too small a base on which to draw general conclusions. However, the results have triggered reflection on a number of topics relevant for the procurement development process. Therefore, suggestions for further research are also provided that are briefly summarized here:

- Strategy types: To further investigate the implications of Mintzberg's *et al*. (2005) schools of thought in the particular context of the procurement development process.
- Strategic stance: To explore the applicability of the Miles and Snow (1978) typology on the individual level of people involved in the procurement development process.
- Knowledge management systems: To further explore how access to relevant procurement knowledge of previous applications can be facilitated.
- Procurement knowledge types: To further investigate what taxonomy of procurement knowledge can help to manage the procurement development process more deliberately.

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Chapter 3

The reasoning behind infrastructure manager's choice of procurement instruments

Abstract[2]

Purpose – *The purpose is to show that for frequently procuring public clients a) the reasoning behind the use of procurement instruments is a process in its own right that requires managerial and scientific attention, b) modelling this process contributes to making sensible procurement choices, and c) managing this process is a relevant factor in the client's development towards strategic procurement.*

Design/methodology/approach – *A model is developed to conceptualize the reasoning behind procurement instruments. Using this model in a case study, the reasoning behind the evolution of a particular procurement instrument as applied by a public infrastructure management organization is reconstructed.*

Findings – *The case study results show that an initially explicitly formulated set of main reasons for operating a qualification system can implicitly evolve over time into a different set of reasons. From a managerial point of view, explication of implicit reasons is important both to avoid the risk that the real value of the procurement instrument remains undetected as well as properly assess its strategic alignment with higher level strategies. The conceptual model proves to be a useful tool to support that.*

Originality/value *– Bringing the reasoning behind the use of procurement instruments to the fore, this study explores an area of construction procurement research that is positioned between the disciplines of purchasing and supply management, knowledge management and strategic management.*

Keywords: case study, knowledge management, strategic management.

3.1 Introduction

Public sector organizations are expected to achieve high performance standards in public service provision (Boyne & Walker, 2010). Since governments have been increasingly outsourcing public service provision to the private sector (Alonso, Clifton, & Díaz-Fuentes, 2013), public performance is also increasingly influenced by the appropriateness of the procurement strategies that clients apply to procure works, services and supplies. However, creating the most appropriate procurement strategy for a given situation can be a complex process. During that process, clients need to make a number of procurement choices that are key to achieving high performance.

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For procurement in the construction industry, literature provides various examples of such key procurement choices. One key choice concerns the selection of the most appropriate procurement system for a given project (Rajeh, Tookey, & Rotimi, 2015). Procurement systems used in construction today include design-bid-build, design-build, alliancing, and public private partnerships. Given the common view that "a 'one-size-fits-all' approach to procurement is unwise" (Walker & Rowlinson, 2008, p. 41), many methods for selecting the best approach have been proposed (see Love, Edwards, Irani, and Sharif (2012) and Rajeh et al. (2015) for overviews). Other key choices include selecting the most appropriate tender procedure (Carbonara, Costantino, & Pellegrino, 2016; Ramsey, El Asmar, & Gibson Jr, 2016), the best method for contractor selection in the prequalification stage (Faikcan & Hakan, 2016; Holt, 2010) or in the tender evaluation stage (Ballesteros-Pérez, Skitmore, Pellicer, & González-Cruz, 2015; de Araújo, Alencar, & Mota, 2017; Walraven & de Vries, 2009).

There is one thing that all these procurement choices seem to have in common. This concerns the input to making the choice: alternative procurement systems, tender procedures, supplier selection methods, and contract award methods are assessed and compared by attributing certain features to each of the alternatives under consideration. Dependent on the match between these features and a range of criteria, one alternative is favoured above others (Luu, Ng, & Chen, 2003; Rajeh et al., 2015). Apparently, some form of reasoning takes place in the client's organisation that results in this attribution of features. However, the quality of the reasoning involved may affect the quality of the procurement choice. It appears therefore that a thorough understanding of the process by which features are attributed to procurement options is conditional to creating appropriate procurement strategies.

While literature on methods to support procurement choices is abundant, the attribution of features to procurement options by practitioners (from here: the reasoning process) has received less attention. This study endeavours to explore this reasoning process as a process in its own right. It aims to assess its managerial and scientific relevance by posing the following questions:

- Why regard the reasoning process as a process in its own right?
- How would modelling this process contribute to making sensible procurement choices?
- How do these insights contribute to the development of strategic procurement?

The third question interprets the previous answers from the generic perspective of strategic procurement. In the Purchasing and Supply Chain Management literature, procurement has long since been recognized as a strategically significant function (Chen, Paulraj, & Lado, 2004; Ellram & Carr, 1994; Úbeda, Alsua, & Carrasco, 2015). Several factors, including the level of involvement in strategic planning, the status, the knowledge and skills, and the level of integration of the procurement function are relevant for developing strategic procurement in an organization (Carr & Smeltzer, 1997; Cousins, Lawson, & Squire, 2006). The value of examining the reasoning process is therefore assessed by its potential contribution to the further development of strategic procurement.

The paper addresses these questions as follows. Firstly, the reasoning process, its locus and its output is described and illustrated in more detail. Secondly, a conceptual model for examining and managing the reasoning process is introduced and tested in an empirical case study. Finally, the conceptual model and case study findings are used to discuss the relevance of the reasoning process from the generic perspective of strategic procurement.

3.2 The reasoning process: locus and illustrations

The general context of this study concerns public procurement in the construction industry. Within this sector, infrastructure managers such as highway and railway agencies commonly are major clients. Such organisations commonly have large ongoing construction portfolios rather than one-off construction projects and thus find themselves in a 'multi-project environment' (Aritua, Smith, & Bower, 2009; Blismas, Sher, Thorpe, & Baldwin, 2004).

Public procurement refers to the process by which public authorities, such as government departments or local authorities, purchase work, goods or services from companies. Procurement has been frequently confused with the terms 'commissioning' and 'purchasing' (Murray, 2009). Here, we follow Murray's (2009) differentiation which, in short, implies that procurement partly overlaps with commissioning activities, while it completely encompasses purchasing activities.

The focus of this study is on the reasoning behind the methods, systems, and documents by which procurement is carried out. This reasoning presumably occurs during certain procurement processes. Therefore, this section first identifies these procurement processes and then singles out the reasoning process.

Purchasing and supply management literature has defined four to ten key processes to describe organizational buying (Ateş, van Raaij, & Wynstra, 2018). Organizational buying typically includes processes that range from specification, supplier selection and contract agreement to ordering, expediting and evaluation (Van Weele, 2010). However, for multi-project organisations, the processes described by PMBOK (2013) match better to the project context. PMBOK (2013) identifies four 'project procurement management processes': 1) plan procurement management, 2) conduct procurements, 3) control procurements and 4) close procurements.

The plan procurement management process is particularly illustrative here. It concerns 'documenting project procurement decisions, specifying the approach, and identifying potential sellers' (PMBOK, 2013, p. 357). The output of this process includes a procurement management plan, which, amongst others, describes the type of contract to be used, evaluation criteria, and procurement documents. In other words, the procurement management plan documents the key procurement choices.

The procurement management plan may also describe *how* the choice was made (the selection method), and *why* (the justification). In general, the choice for a certain type of contract, set of evaluation criteria, or procurement document is based on a comparison of alternative

procurement instruments (Luu, Thomas Ng, & Chen, 2003). To enable this comparison, certain features must be attributed to these instruments. These features help to answer why a particular alternative is most appropriate.

It is this attribution of features to procurement instruments that this study hones in to. Alluding to it as the 'reasoning process', it aims to separate this reasoning process from main processes such as the plan procurement management process. The reasoning process is thus viewed as a *sub-process* that occurs during, or is triggered by, several main processes by which procurement is carried out.

To explore the locus of the reasoning process, this study employs a categorization of processes that is different to the organizational buying processes mentioned above. It identifies the processes by which the client maintains, applies and (further) develops procurement instruments. So instead of following the 'life cycle of the agreement' (PMBOK, 2013, p. 356), this categorization follows the life cycle of single procurement instruments.

This procurement instrument life cycle perspective is based on the phenomenon that multi-project public clients commonly maintain a set of standardized procurement instruments. Maintaining such a set is argued to create time and cost efficiencies, a range of contracting options, ease of use and compliancy to legislation and policy (e.g. Australian_Government, 2007). Literature examining this particular perspective is scarce. However, as the content of this set of standardized procurement instruments may change over time, we suppose that the following four main processes are run in the client's organisation:

- Selection process
- (Re-)development process
- Reuse consideration process
- Portfolio configuration management process

Again, we also suppose that the reasoning process occurs as a sub-process within each of these four main processes. To support this assumption, the processes are now described in more detail. For the first process, literature is cited to exemplify the output of the reasoning process. For the other three, we argue why the reasoning process occurs.

3.2.1 The selection process

The PMBOK (2013) plan procurement management process involves selecting the most appropriate procurement instrument out of a range of alternatives. On a high level, this concerns the selection of the most appropriate procurement system (Love et al., 2012). Since the move away from traditional procurement (Egan, 1998; Latham, 1994), a range of alternatives has been developed including Design&Build, Design-Build-Maintain, Private Finance Initiative, Partnering and Project Alliancing (Walker & Hampson, 2003). Based on the view that there is no 'one size fits all' approach to procurement, public infrastructure managers are currently advised to consider per project which alternative best matches the needs of each project (see, for example,

reports issued in the United Kingdom (Treasury, 2013), the Netherlands (Jansen, 2009) and Sweden (Eriksson & Hane, 2014)).

It has been asserted that in practice, procurement selection decisions are founded on experiences of previous similar examples. These experiences are coupled with intuitive evaluations to set the distinctive requirements for the current procurement situation (Luu, Thomas Ng, et al., 2003; Masterman & Masterman, 2013).

Literature provides examples of the input that practitioners bring forward during the selection process. Love et al. (2012) report on a case study in which Design & Construct (D&C) and Traditional Lump Sum (TLS) variants are compared for a school construction project. While scoring the appropriateness of the variants against a set of criteria, reasons to support the scores are provided. Two citations may illustrate the reasoning singled out in our study: 1) "D&C routes provide maximum ability for contractors to add value in design' and 2) with TLS 'a greater level of design quality may be anticipated' (Love et al., 2012, p. 319). Arguably, reasons such as these are based on the practitioners' understanding of the outstanding features of the procurement systems in question.

Once a procurement system is selected, additional selection processes need to be carried out. Procurement systems are merely high-level abstractions of procurement practice. To actually apply a procurement system, public infrastructure managers need to operationalize the conceptual procurement system into a concrete set of tender documents. Next to the contract with its annexes, terms and conditions, this also includes documents that describe and facilitate the tender procedure (documents explaining the tender process, templates for correspondence, etc.). In terms of PMBOK, these concern the procurement documents (PMBOK, 2013). Moreover, to execute the procurement process several other systems, methods and tools are used, such as prequalification systems and past performance measurement tools. Again, to denote all these systems, methods and tools, this study employs the term 'procurement instruments'.

Literature also provides examples of reasoning process output at this procurement instrument level. In comparing supplier selection methods, Bergman and Lundberg (2013, p. 82) illustrate the kind of reasoning this study is exploring: "In non-complex situations, …, lowest price, being a simple and robust supplier selection method, is to be preferred." The features attributed to the lowest price supplier selection method here are that it is simple and robust. Such reasoning is also expressed by practitioners in, for instance, a project team session where a procurement strategy is devised, or in a procurement policy document.

3.2.2 The (re-)development process

The selection process presupposes that infrastructure managers dispose of alternative procurement instruments. However, the acquisition of procurement instruments requires scarce organisational resources. Clients may follow one of three routes to acquire procurement instruments, and arguably take the required resources into account when deciding about the most appropriate route.

The first route is to apply generally acknowledged standards, such as the internationally applied FIDIC suite of contracts provided by the international federation of consulting engineers (Bunni, 2013) or national standards such as the NEC3 Engineering and Construction Contract (Eggleston, 2015) used in the UK.

The second route is to 'adopt and adapt' a general standard. This route involves a development process. For instance, Network Rail, the UK's rail infrastructure manager, maintains its own standard suite of contracts (which is publicly accessible on the internet). Some of these contracts include amendments to the UK's general 'Infrastructure Conditions of Contract (ICC)'. For example, in operationalizing the Design & Build concept, Network Rail's 'NR9' document contains amendments to the 'ICC Design and Construct Version' (NetworkRail, 2018). Such adapted contracts are also alluded to as bespoke contracts (Meng, 2014).

The third route is to (re-)develop a new procurement instrument that is not based on a standard. This route involves a development process in which the client designs a procurement approach (potentially from scratch, or based on an external example), applies it in practice, and then perhaps subsequently redesigns it. Examples of this third route are the redesign of project alliancing applications (Plantinga & Dorée, 2016) and the development from scratch of a contract award mechanism that stimulates suppliers to reduce CO2 emission (Rietbergen & Blok, 2013).

Literature indicates that procurement systems are no stable concepts, but rather emerge and evolve over time as they interact with other procurement systems (Franz & Leicht, 2016; Lahdenperä, 2012), or are being critiqued for certain negative features (Love, Mistry, & Davis, 2010). Clearly, the extent to which a client actively participates in this general evolution may vary. It does seem reasonable though to assume that multi-project clients will not restrict their procurement practices to the first route exclusively. The (re-)development process is therefore probably run every now and again in such organizations.

In the first route, literature (e.g. Hughes, Champion, & Murdoch, 2015) or external procurement consultants may provide a client with a set of reasons in the form of instrument features, describing which instrument is most appropriate in a given case. However, application of the second route, and especially the third route probably requires more in-depth, client specific knowledge and thus internal resources. To justify spending these resources, the motivation must be that instruments currently available to the client do not incorporate certain needed features. Thus, the reasoning process is also an important sub-process to the (re-) development process.

3.2.3 Re-use consideration process

To benefit more than once from newly developed procurement instruments, the client needs to consider the instrument's potential for future reuse and subsequently follow up on the most appropriate strategy for sharing the gained knowledge within the organisation. Codification, personalisation and people finder are three main knowledge sharing strategies (M. Ragab & A. Arisha, 2013). The creation of contract templates (Argyres & Mayer, 2007) may serve as a typical example of the codification strategy. Knowledge sharing on new procurement instruments has much in common with the general topic of learning between projects (Hartmann & Dorée, 2015).

However, as yet this particular organizational process of considering and facilitating the re-use of procurement instruments has received scarce research attention. Here, we allude to it as the 're-use consideration process'.

As with every process, running this process requires scarce organisational resources. Practitioners assumedly require a solid justification to start and complete it. Similar to the (re-) development process, it would only make sense to run this process if the new instrument has features distinctive from other instruments already in use by the client. So again, also in this process the reasoning behind the newly developed procurement instrument is key input to support decision-making.

3.2.4 Portfolio configuration management process

Above it has been indicated that multi-project public clients use a set of procurement instruments that are standardized for general use in the client's projects. To our knowledge, literature does not apply a common term for this set. In this paper, it is alluded to as the 'portfolio of standardized procurement instruments'.

The portfolio configuration management process concerns the process of updating and changing this portfolio. Updates will be necessary due to changing legislation, changing procurement policy, or improvement proposals received from its users. Also, either because instruments have become obsolete or new procurement instruments are added, its content will change over time. The relation between the four main organisational processes is illustrated in Figure 1.

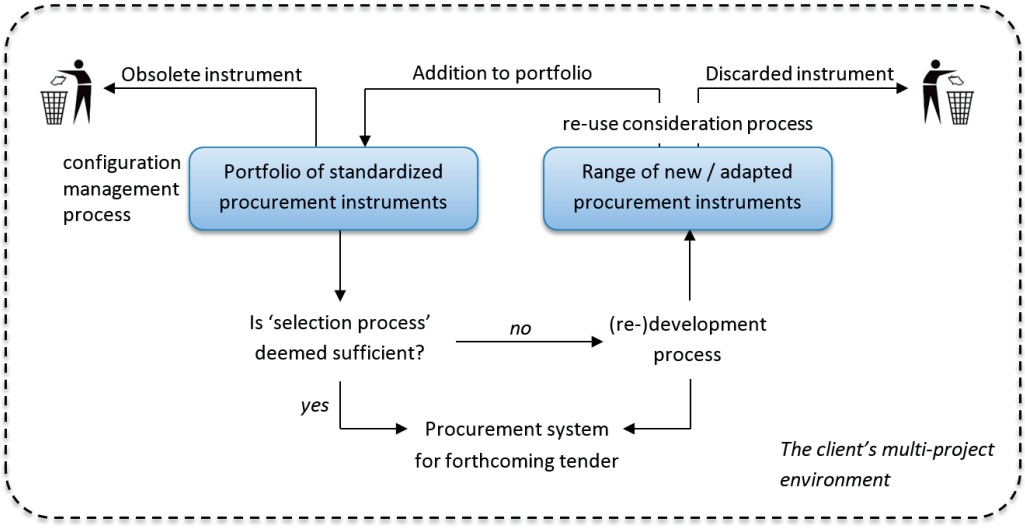

Figure 1: The life cycle of procurement instruments

Similar to the previous processes, the reasoning process is an important sub-process here, since decision making on portfolio changes and updates requires input in the form of features of procurement instruments.

3.2.5 Conclusion

While literature on the selection process may yield the most striking examples, it is not the only process in which the reasoning process occurs. This section introduced four main organisational processes that together describe the life cycle of procurement instruments. The attribution of features to procurement instruments is argued to be relevant for decision making in each of these main processes.

Having direct consequences for decision making, these processes form the formal loci of the reasoning process. However, the reasoning process also occurs in more or less informal settings. Next to generating lessons learned during the 'close procurements process' (PMBOK, 2013), practitioner conversations over lunch, department meetings, trade journals and academic literature may also create or change practitioners' views on procurement instruments.

All these considerations indicate that the attribution of features to procurement instruments is an important process that occurs in many settings. While it influences decision making on the procurement strategy in single projects, it also influences the course of a procurement instruments' life cycle. Given all these occurrences, the reasoning process probably does not start from scratch every time again. There is rather some consistency in how an instruments' main features are viewed within the client's organisation. We conclude therefore that the reasoning process deserves to be examined as a process in its own right.

3.3 Model development

The previous sections proposed to view the attribution of features to procurement instruments as the output of a distinct process. Supposing the quality of its output affects the quality of decision making, the question emerges how the reasoning process can be managed. If it can be managed, than that would contribute to making sensible procurement choices. With this aim, this section proposes a conceptual model to analyse and manage the reasoning process. Its theoretical point of departure is primarily based on the concept of organizational knowledge (Tsoukas & Vladimirou, 2001).

The reasoning process involves organizational members who characterize procurement instruments in order to come to procurement choices. This concerns a form of knowledge processing. Tsoukas and Vladimirou (2001, p. 976) hold that 'data, information, and knowledge are three concepts that can be arranged on a single continuum, depending on the extent to which they reflect human involvement with, and processing of, the reality at hand'. Put simply, data require minimal human judgement, whereas knowledge requires maximum judgement. Thus, the reasoning process involves the processing of knowledge rather than data.

Knowledge is an elusive concept. Tsoukas and Vladimirou (2001) describe knowledge as the individual capability to draw distinctions, within a domain of action, based on an appreciation of context or theory, or both. Translated to this study, the output of the reasoning process is thus dependent on the capability of the practitioner(s) to distinguish one procurement instrument from another. The domain of action may concern one of the main processes described above.

The context may include a certain type of projects, market segment, or set of organizational objectives.

While individuals may draw from own previous experiences with particular procurement instruments, they can also be influenced by organizational knowledge. Organizational knowledge has been described as 'the capability members of an organization have developed to draw distinctions in the process of carrying out their work, in particular concrete contexts, by enacting sets of generalizations (propositional statements) whose application depends on historically evolved collective understandings and experiences' (Tsoukas & Vladimirou, 2001, p. 983). We view a statement like 'D&C provides maximum ability for contractors to add value in design' as such a generalization. Although it may be based on a practitioner's personal experience, it may as well concern a historically evolved collective understanding that the practitioner draws from.

3.3.1 Argumentation and generalization

The reasoning process amounts to articulated expectations or predictions of the empirical effects of a procurement system, or a specific procurement instrument, in the forthcoming project(s). The reasons function as arguments for or against particular options. Therefore, reasoning containing predictions is alluded to here as 'argumentation'.

As described above, we hypothesize that such argumentations are often based on empirically observed effects that are expressed in the form of generic statements (generalizations). This links with the notion of organizational knowledge in the sense that "individuals draw and act upon a corpus of generalizations in the form of generic rules produced by the organization" (Tsoukas & Vladimirou, 2001, p. 979). The process leading up to such statements is assumed to be similar to the concept of theorization. Theorization concerns "the self-conscious development and specification of abstract categories and the formulation of patterned relationships such as chains of cause and effect" (Strang & Meyer, 1993, p. 492). To make it practical, the creation of generalizations may for instance be stimulated by organising lessons-learned sessions (Carrillo, 2005).

The term generalization is also used here to reflect the possibility that the statement may not be true for all past experiences. For example, Design & Construct may not have added value in the design of a particular project, because the contractor's design team underperformed due to a temporary lack of design capacity. As such, there is also a risk that generalizations may be based on defective induction.

To sum up, argumentations and generalizations represent the reasoning used in the four main processes. They represent and express patterned relationships that are abstracted from a complex reality and attributed as features to procurement systems or single procurement instruments.

3.3.2 Knowledge Management

The idea that knowledge can be managed has given rise to a vast amount of literature (Serenko, Bontis, Booker, Sadeddin, & Hardie, 2010). Literature on Knowledge Management (KM) in the construction industry has also long since been increasing (Anumba, Egbu, & Carrillo, 2008; Kamara, Augenbroe, Anumba, & Carrillo, 2002; Tan et al., 2010). The KM literature identifies at the minimum four basic KM processes or phases: 1) knowledge creation and acquisition, 2) storage and retrieval, 3) transfer and sharing and 4) knowledge application (Alavi & Leidner, 2001). Although other scholars identify up to ten processes (M. A. F. Ragab & A. Arisha, 2013), to keep our model simple the four basic KM phases suffice. These form the base structure of our model, on which subsequently the reasoning process is mapped.

To illustrate how it is mapped, we refer to the examples mentioned in the previous section again. Imagine that the statement 'D&C provides maximum ability for contractors to add value in design' is expressed in the selection process. In this process, procurement knowledge is applied to create a convincing argumentation for a procurement strategy. It thus concerns the knowledge application phase. The next phase concerns knowledge creation and acquisition. Knowledge may be acquired by comparing expected with empirical outcomes: Did D&C in this project indeed provide maximum ability for contractors to add value in the design? The acquired knowledge may be that D&C-contracts "…require greater commitment from us as a client to get what we want, as this is not predefined in a detailed design" (Eriksson, 2017, p. 220). This new knowledge may then be transferred from the situated to the organizational context through generalizations (the transfer and sharing phase), making it available for the final KM phase: storage and retrieval.

In all of these processes, it is likely that only part of the knowledge will be expressed or documented. As such, the tacit/explicit distinction is an indispensable element of the model (Polanyi, 1966). Whereas tacit knowledge in its extreme form cannot be articulated, other forms of tacit knowledge can be converted to explicit knowledge (Nonaka & von Krogh, 2009). Combination of the KM concepts with argumentation and generalization leads to the model depicted in Figure 2.

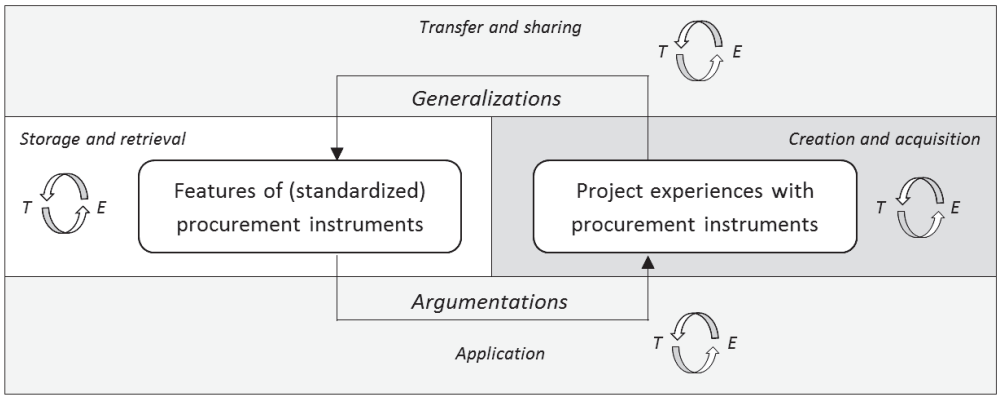

Figure 2. Conceptual model of the reasoning process (T = tacit, E = explicit)

3.4 Model testing

To explore the model's potential value, it is tried out in the empirical context of a public sector client. Performing a case study seemed appropriate, since “a case study’s unique strength is its ability to deal with a full variety of evidence – documents, artefacts, interviews and observations – beyond what might be available in a conventional historical study” (Yin, 2014, p. 12).

The model is tested for a single procurement instrument. The object of the case study is a qualification system, a procurement instrument that has been in operation for many years by ProRail, the Netherlands state railway agency. This procurement instrument was selected for two reasons. First, it seemed appropriate for analysing the reasoning process, because at the start of the study it was known that it had already been in use for a long time, and that some developments had been carried out over time. This suggests both some consistency in the reasoning for remaining in use, but also changes in the reasoning that explain the further development. Second, a number of officers with knowledge of the instrument and its history were still working for the agency. Given our aim to search for and convert potentially relevant implicit reasoning into explicit reasoning, this circumstance was recognized as a good opportunity.

A qualification system should not be confused with the tender stage in which contractors can prequalify for a particular project. The European Union's public procurement directives distinguish a specific group of public clients covering those 'entities operating in the water, energy, transport and postal services sectors'. The procurement activities of this group are regulated by 'the Utilities Directive' (directive 2014/25/EU). Public clients in this group have the option of selecting possible contractors for a period of time and a certain scope of work, rather than having them re-qualify at every tendering procedure. This is called a 'qualification system' (article 77, directive 2014/25/EU). According to the European Commission, qualification systems are suited to the procurement of technically exacting works, supplies or services that would otherwise involve lengthy qualification procedures (European Commission, 2011). The generally attributed advantages of this system are that it reduces costs and delays in procurement (Arrowsmith, 2003).

To show how the model is used, we briefly present the four research steps that have been executed.

Step 1: preparatory activities - The first step was to establish an overview of how the current qualification system (QS) evolved. Documentation on the QS was collected insofar as it could be retrieved from publicly available information and the client’s internal archives. Using this information, the changes made to the QS over time were reconstructed. Next, given that the model focusses on the reasoning process, the documentation was closely searched for explicit statements related to motives, reasons or arguments, and descriptions of effects. These were then linked to the modifications to the QS over time.

Step 2: semi-structured interviews - The second step was to carry out semi-structured interviews with employees currently in service at the client. Interviews have been held with staff members

perceived by the organization as the most knowledgeable on the QS because of their current or previous function. Amongst these interviewees were both the current and the previous manager responsible for the daily operation of the QS, and the employee who developed the first application of the QS and has remained influential in its later development.

The interviews had several goals. The first being to seek opinions on the reasons uncovered in Step 1: would the interviewees consider these reasons as adequately representing the previous and current purposes of the QS? If deemed inadequate, interviewees are asked to explain their perceptions of the reasoning using a causal map. This approach was chosen for two reasons. First, we assumed that the assessment to touch upon the model's reference to tacit and explicit knowledge. In the KM literature, causal mapping by a group is proposed as a means for extracting tacit knowledge (Ambrosini & Bowman, 2001). Second, we anticipated the reasoning to address various elements and positions in a hierarchical chain of cause-and-effect relationships, and causal mapping facilitates thinking in such a hierarchy (Bryson, Ackermann, Eden, & Finn, 2004). The third purpose of the interviews was to determine whether the interviewees know of additional documents to those retrieved in step 1 that could explain the motivations behind the developments in the reconstructed QS evolution.

Step 3: sorting the collected information - The third step was to sort the collected information based on the model. The model is intended to help categorize the information by prompting questions such as:
RQ 1) Which motives, reasons or arguments are used to explain why the QS as it stands is in use and/or why it needs to be adjusted (argumentation)?
RQ 2) Which empirically observed effects have been attributed to the QS procurement instrument (generalization)?
RQ 3) Which of the answers given to these two questions are available in a documented form that colleagues could use in applying the QS (the concept of tacit/explicit knowledge and the codification strategy)?

Step 4: compare results over time – The fourth step was to compare the results of the previous steps with similar steps carried out after a period of one and a half year. By then, some persons involved in the operation of the QS had changed function. Again, causal maps are composed by staff members knowledgeable on the QS, which are then compared to the results of the previous steps.

3.5 Case results

For the purposes of this paper, the case results are presented by means of two concise tables. The first table illustrates how the QS has changed over time and which corresponding reasons were retrieved from documents. The second table illustrates the current reasons for operating the QS.

3.5.1 Evolution of the qualification system and the corresponding explicit reasoning

At the start of the research project, it was generally acknowledged within the client's procurement department that the QS approach had been in use for a considerable time. However, it was unclear why and when was it first applied, and how and why had it evolved ever since. Table 1 outlines the evolution of the QS as reconstructed by this study.

Table 1: Evolution of the QS and the corresponding reasoning as retrieved from documents

Year	Context description and evolution of qualification system (QS)	Corresponding reasoning, as far as it could be retrieved from documents
1995	Context: Splitting up of Dutch railways into an infrastructure manager, a train operating company and commercial firms. Few competitors for railway-specific projects.	-
1995	Establishment of QS 1, for a large programme on platform modifications.	-
1996	Establishment of QS 2 for contractors in the rail branch.	Increase in number of competitors (QS1 led to increase from 2 to 7 competitors); to control market entry; to reduce tendering costs.
1997	Scope of QS 2 expanded to include engineering bureaus	Increase in competitors; to control market entry; to reduce tendering costs.
1998	Scope of QS 2 expanded to include cabling contractors.	Identical to reasoning in 1997.
1998	Scope of QS 2 expanded to include workplace safety companies.	Identical to reasoning in 1997.
2001	Context: Report on procurement practices from 1995 to 2000 by Dutch Audit Court.	Report concluded that the QS had contributed to an increase in competition.
2003	Scope of QS 2 expanded to include maintenance contractors.	Identical to reasoning in 1997.
2005	Context: Management concession granted to the client requiring environmental and safety management systems by January 2007 and January 2008 respectively.	-
2006	Scope of QS2 expanded to include companies for securing that tracks are safely open for traffic.	Identical to reasoning in 1997.
2009	Scope of workplace safety companies within QS 2 expanded to include safety personnel agencies.	Identical to reasoning in 1997.
2013	Scope of QS2 reduced by removing companies for securing that tracks are safely open for traffic.	-

The reconstruction shows that the QS currently in use (QS2) has been in place for nearly twenty years. Further, while its structure has remained essentially the same, it has been changed several times, generally to expand its scope. However, the reasons for these changes, insofar as these could be retrieved from documents, did not quite seem to address the particular changes made. The documents uncovered tended to describe the change itself rather than why an adjustment was being made.

When asked about this, interviewees agreed that reasons for the adjustments were generally not that explicitly documented. Moreover, they argued that some knowledge of the historical context of the QS is necessary for a good understanding of its evolution. For instance, they explained that the expansion of the QS towards other market sectors was primarily driven by incidents on railway safety or reliability as these occurred over time. The QS seemed an appropriate tool to reduce such incidents. In addition, the context of the QS had changed over time as well. To illustrate this, some descriptions of the historical context are added to Table 1 (marked by 'context').

An anecdotal detail is that QS1 was only accidentally uncovered when an interviewee produced an old paper document that he thought might be interesting for the research. It dated from 1995 and came from his personal archive. This had preceded QS2 and has apparently disappeared from the collective memory of the interviewees. Interestingly, this document considered the pros and cons of establishing qualification systems. None of the retrieved documents related to QS 2 included such considerations of the advantages and disadvantages. It appears therefore that QS1 has been successful in achieving an increase in the number of competitors and that this success became part of the reasoning for QS2.

3.5.2 Current reasoning for operating the QS

Table 2 outlines the reasoning for the current QS in terms of the conceptual model: argumentations, generalizations and empirically observed effects. Only those items that are positioned on roughly the same high hierarchical level of the causal maps are presented. Note that the ordering in the table is indicative of the relative importance attributed by the interviewees as a group. Individual interviewees have slightly different rankings. Reasons brought forward by interviewees that were also identified in the documents are marked by an asterisk (*).

Table 2 shows that the top three argumentations in favour of the QS, i.e. the ones most emphasized in the interviews, are not explicitly stated in any of the retrieved documents. Nevertheless, these were consistently perceived by the interviewees as the most important reasons for operating the current QS manifestation. When asked about the dominant implicit character of the reasoning, one interviewee suggested that the efficacy of the QS would rise if greater attention was given to communicating these argumentations: "If colleagues better understood the purposes of the QS, they would probably better inform us with early warnings that a firm might be decreasing in capabilities. That would enable us to anticipate, instead of reacting".

Table 2: Currently used argumentations, generalizations and the observed effects

Argumentation (purpose of QS)	Generalization (what QS does)	Observed empirical effect
1) Compliancy with the safety and environmental requirements of the government's concession.	The QS enables the client to comply with the safety and environmental requirements of the government's concession.	The QS has been one of the main reasons for the auditor to conclude that client has been compliant.
2) Contribute to a safe and reliable rail infrastructure.	The QS ensures that only firms that have mastered the required capabilities get to work on the core of the Dutch rail system.	Instances where things went wrong prove that firms require knowledge of the uniqueness of the Dutch rail system.
3) Stimulate contractors to improve or gain additional competences in the future.	The QS enables the client to stimulate contractors to further improve or gain additional competences.	The market's adoption of Systems Engineering has been enabled by the qualification system.
4) Market entry to occur in a controlled manner*.	The QS ensures that new contractors enter the client's market in a controlled manner.	Newcomers have invested considerably in order to be able to demonstrate their competence.
5) Reduction in tender costs and duration*,	The QS reduces tendering costs and time.	Given the high demands and substantial paperwork, periodic qualifying has reduced costs and times considerably over qualifying for each tender.
6) Increasing number of competitors*.	The QS increases the number of certified competitors.	The number of certified competitors has increased in most branches, though it has remained limited in some.

**Reasons also identified in the documents.*

The comparison over time of the main reasons for using the QS yielded an ambiguous result. On the one hand, according to the individually filled out causal maps, there appeared significant diversity in the individual perceptions of the QS's main reasons. On the other hand, the top six main reasons remained the same, even after discussing the comparison with the results of one and a half years ago.

In conclusion, the QS clearly has evolved over time, mainly in the sense of expanding its scope towards other market sectors. As affirmed by the interviewees, changes to the QS are sparsely explained by documented reasons. Documented considerations of advantages and disadvantages of applying a QS date back to about 18 years ago. Moreover, for the current set of reasons for operating the QS, it strikes that explicitly documented reasons are sided by implicit, non-documented reasons, and that the latter are perceived by the interviewees as being the most important ones.

3.6 Discussion

In the first part of this paper, it was theorized that it is indeed worthwhile to examine the reasoning process as a process in its own right. The case study provides empirical material to reflect on this statement again, to discuss how modelling the reasoning process contributes to making sensible procurement choices, and to assess its potential contribution in the further development towards strategic procurement.

3.6.1 Reasoning as a process in its own right?

The case study results show that the top three reasons for applying the QS have emerged over time and have gained priority over the original reasons, yet have not been documented. The knowledge of these reasons remained at the level of few individuals. The emergence of these reasons seems to have been a non-organized, incident led process. Also, it appears that at least the first and third of these top reasons have emerged independently from the use of the QS. The first reason concerns the compliancy with the safety and environmental requirements of the government's concession. These concession requirements were introduced only long after the QS was taken into use. Apparently it was found that the QS has a relevant role in meeting these requirements. The third reason concerns the stimulation of contractors to improve performance. However, the adoption of Systems Engineering - an example brought forward to support this reason - was not envisioned originally.

Given this pattern of emerging reasons, it can be concluded that the reasoning process indeed should be regarded as a process in its own right. Although it may be triggered by the any of the four main processes, the results show that it can also occur independently of these. The general suggestion is that reasoning regarding any procurement system or instrument may change over time and thus change the set of previously used reasons. If these changes go unnoticed, the real value may become hidden or remain undetected, and perhaps also unexploited. It may even be worse, since changing reasons introduce the risk of inappropriate application of procurement options.

3.6.2 Does the model contribute to making sensible procurement choices?

The conceptual model is primarily based on the claim of KM literature that organizational knowledge can be managed (Alavi & Leidner, 2001). However, knowledge is an elusive concept. Therefore, to benefit from applying KM concepts and methods in a particular context, a first step concerns the identification of the type of knowledge that is to be managed. In this study, this is done by characterizing practitioners' knowledge in terms of generalizations and argumentations. The causal mapping method helps to put these in hierarchical order. The type of knowledge that is retrieved thus concerns a list of reasons that currently dominate the logic for applying the QS. This list provides valuable information for decision-making on the continuation or further development of the procurement instrument. We conclude therefore that application of the conceptual model contributes to making sensible procurement choices.

Returning to the claim that organizational knowledge can be managed, we hold that the model also enables practitioners to examine and manage the reasoning process over time. It helps to

avoid potential pitfalls, such as the possibility that one or more of the models' steps are skipped (e.g. to jump directly from argumentations to generalizations without examining empirical effects) or poorly taken (e.g. wrong interpretation of empirical effects, faulty generalizations, not taking over all relevant features).

In a similar way, literature also points at a theoretical consideration that supports the use of the model. Tsoukas and Vladimirou (2001) suggest that Knowledge Management is the dynamic process of turning an unreflective practice into a reflective one. Practical mastery needs to be supplemented by a quasi-theoretical understanding. Applying their general argument to this particular context (Tsoukas & Vladimirou, 2001): Practitioners may have (unreflectively) mastered certain procurement instruments, but if they need to teach new colleagues, or reflect on ways to improve the instrument, or get rid of likely confusions about the instrument, then they need to elucidate the use of the instrument by making explicit the reasons behind the instrument. In a similar way, literature has stressed the importance of reflection for learning (Bijleveld & Dorée, 2014; Schön, 1983). The model facilitates practitioners to do that.

3.6.3 Contribution to strategic procurement

The final aim of this paper is to assess the value of the study's results from the perspective of strategic procurement. In the private sector, procurement has long since been recognized as a strategically significant function that is capable of driving and delivering competitive advantage (Ellram & Carr, 1994; Úbeda et al., 2015). While there are several differences between procurement in the private and the public sector (Arlbjørn & Freytag, 2012), in the public sector it is also increasingly recognized that public procurement can play a strategic role, not just in saving money, but in delivering broader government objectives (Zheng, Knight, Harland, Humby, & James, 2007).

Literature holds that several factors, including the level of involvement in strategic planning, the status, the knowledge and skills, and the level of integration of the procurement function are relevant for developing strategic procurement in an organization (Carr & Smeltzer, 1997; Cousins et al., 2006). This development has been examined from the perspective of maturity models. More mature procurement functions spend more time on strategic activities, and use a higher number of tools and methodologies, and apply more complex strategies (Úbeda et al., 2015).

Assessed from this perspective on strategic procurement, the value of this study primarily lies in the notion that the reasoning process can, and should be deliberately managed by the procurement function. It should be managed, because it enables the procurement function to link the use and further development of procurement instruments with organizational strategy. To put it simply, while the conceptual model indicates *how* one can keep track of the reasoning behind procurement instruments, strategic management theory explains as to *why* one should keep track of the reasoning. The following three points elaborate this position in more detail.

1) Public sector strategic management. Managing the reasoning process deliberately concerns the essence of performing strategic management. Bryson (2010, p. 256) describes public sector

strategic management as "the appropriate and reasonable integration of strategic planning and implementation across an organization (or other entity) in an ongoing way to enhance the fulfilment of mission, meeting of mandates, continuous learning, and sustained creation of public value". Strategic planning includes "clarifying organizational purposes and the requirements and likely strategies for success" (Bryson, 2010, p. 257). In terms of infrastructure procurement, these 'likely strategies for success' are those that address the procurement of works, supplies and services. Since the reasoning process yields relevant input to decision making on the use of procurement instruments, explication of this reasoning contributes to the clarification of likely strategies for success.

2) Strategy formation. The reasoning process links to the topic of strategy formation. Five different meanings can be attached to the word strategy ("the five Ps for strategy": plan, pattern, position, perspective and ploy) (Mintzberg, Ahlstrand, & Lampel, 2009). Here we consider the 'pattern' of strategies: strategies can be intended, deliberately carried out or emerge and, eventually, proven to have been realized or not. The case study shows that the set of reasons behind the use of the QS has become a mix of intended and emerged reasons. Given the priority attributed to the emerged reasons, the pattern of the reasoning for the QS over time primarily qualifies as an emerging strategy. The explication of these implicit, emerging reasons enables the client to return from partly implicit strategy formation to explicit strategy formulation again.

3) *Strategic aligment*. Literature indicates that creating strategic alignment is key to performance (Baier, Hartmann, & Moser, 2008; Gonzalez-Benito, 2007). While alignment may concern many aspects (Ateş et al., 2018), it certainly concerns the fit between procurement instruments, procurement strategies, and ultimately, strategic goals. In the case study, the current fit between the QS and higher level strategies can be more properly assessed now that also the implicit reasons have been explicated.

3.6.4 Study limitations and future research

Clearly, there are several limitations to this exploratory study. Firstly, the empirical part of this paper is based on the results of one case study only. Also, the case concerns only one procurement instrument that is used within the context of only one public sector client. More and different types of procurement instruments could reveal different patterns of reasoning than the one uncovered in our case study.

Secondly, since the conceptual model is only a first conceptualization, further research could develop and test more sophisticated models. While the model is based on a distinction between four core KM processes, literature also provides more detailed classifications. Next, the conversion of tacit to explicit knowledge received little examination in this study.

Thirdly, different forms of research could be beneficial to further explore the reasoning process. Since it may concern a single practitioner's reasoning, but probably most often will concern reasoning in a group of practitioners, interactions between individuals may influence the outcome of the reasoning. Research methodologies such as critical discourse analysis could reveal such aspects of the reasoning process (Kwon, Clarke, & Wodak, 2014).

Directions for further research are therefore to investigate the reasoning process behind other procurement instruments, in other (public) client organizations, and to develop and test more sophisticated models for conceptualizing the reasoning process.

3.7 Conclusion

Procurement choices may have significant impact on an organisation's performance and attainment of strategic objectives. Since procurement choices are influenced by the reasoning behind procurement instruments, it is key to manage the processes that produce such reasoning. This not only enables the procurement function to examine the quality of the reasoning that is brought forward, but also to deliberately align the use and further development of procurement instruments with organizational strategy. As such, deliberate management of the reasoning process contributes to making sensible procurement choices and is a relevant aspect in the development towards strategic procurement.

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Chapter 4

Clarifying strategic alignment in the public procurement process

Abstract[3]

Purpose *– While the need for strategic alignment in public management has been recognized, there is a lack of conceptual clarity to support its application in practice. Focussing on the specific field of public procurement, this paper clarifies and illustrates how the concept of strategic alignment can be applied when strategizing the public procurement process.*

Design/methodology/approach *– The current literature on strategic alignment in public procurement is critically reviewed to identify ambiguities that hamper its application in practice. Based on this review, an analytical framework is developed that conceptualizes strategic alignment as that between the procurement instruments used in a sourcing project and the corresponding higher-level strategies. The framework is empirically illustrated by applying it in a case study that reconstructs the procurement strategy for an innovation project.*

Findings *– Strategic alignment in the public procurement process can be demonstrated by identifying, explicating and logically linking reasoning and trade-off decisions on competing priorities across multiple levels and dimensions of strategy.*

Originality/value *– Although creating alignment between policy and public procurement practice is generally held to be important in the public management literature, it is only discussed on high levels of abstraction. This paper provides clarity by investigating alignment in greater detail.*

Keywords: bid design, procurement strategy, strategic alignment, strategy formation.

4.1 Introduction

Public procurement, the purchasing of goods, services and works by governments and state-owned enterprises, is a key economic activity. It represents approximately 12% of gross domestic product in OECD countries, ranging from 4.9% in Mexico to 19.5% in the Netherlands (OECD, 2019).

While public procurement is increasingly recognized as a potential strategic instrument and a lever for achieving government policy goals (OECD, 2019), there is a lack of evidence about how public procurement can contribute. Little is known about how procurement is implemented, what factors and actors determine its effectiveness and success, and how public procurers deal with the often conflicting goals that they have to combine (Grandia and Meehan, 2017).

In particular, Grandia and Meehan (2017, p. 303) observe 'a lack of alignment between policy and public procurement practice'. Although the need for alignment affects all government

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administrative functions, alignment in public procurement is particularly important because it has a significant impact in terms of public spending and value creation. It thus seems that creating alignment is vital if public procurement is to be used as an effective strategic policy tool.

However, despite its relevance, the concept of alignment is little studied in the public procurement literature. Although alignment between government policy and public procurement has been addressed in previous research (e.g. Glas *et al.*, 2017; Patrucco *et al.*, 2017a), the application of this general concept in the specific context of public procurement has not been adequately clarified.

One major shortcoming in the limited literature on strategic alignment in public procurement is that the conceptualizations used hardly consider the public procurement process. This is remarkable given that public procurement is often defined by its operational process of acquiring goods, services and supplies (OECD, 2019; Patrucco *et al.*, 2017b; Thai, 2009). This process has even been called 'the "heart" of the procurement system in public institutions, as its activities are the main determinants of final performance and can support or hinder policy-level decisions' (Patrucco *et al.*, 2017b, p. 252). Given that the procurement process is such a hallmark of public procurement, and that establishing strategic alignment is so important, it is vital to provide conceptual clarity, and clear empirical examples of how the two concepts are related.

To address this shortcoming, the present paper takes a first research step by exploring how strategic alignment can be *demonstrated*. This focus is based on the assumption that the *creation* of strategic alignment should be viewed as a strategizing process that involves the 'action, interaction and negotiation of multiple actors and the situated practices that they draw upon' (Jarzabkowski *et al.,* 2007, p. 7). While the alignment creation process may thus involve many aspects, identifying its outcome is probably more straightforward.

Further, to investigate the procurement process, this paper considers the strategic alignment between *procurement instruments* and *higher-level strategies*. As will be explained later, this interpretation of strategic alignment is similar to the private sector definition used by Søgaard *et al.* (2019, p. 161), who define it as 'the consistency of purchasing strategies and activities with corporate objectives'.

Knowing how to demonstrate strategic alignment in the public procurement process is not only relevant for evidencing public procurement's contribution to broader policy and government objectives. It is also relevant for public organizations aiming to evolve from strategic planning to strategic management. To actually realize strategic plans, public procurement needs to be aligned with these plans. From a public management perspective, such alignment makes public procurement an implementation activity, and thus part of strategic management as defined by Bryson and George (2020). Despite this being an important perspective, most of the strategy implementation literature focuses only on performance measurement and management.

The paper is organized as follows. The next section provides a critical discussion on the conceptual clarity of strategic alignment in the public procurement literature. Key constructs from this, and from related fields of study, are subsequently used to develop an analytical framework for strategic alignment. Then, to illustrate how the framework can be utilized in practice, the paper presents a case study in which the strategic alignment is reconstructed for a specific sourcing project. The discussion and conclusions sections highlight the theoretical and practical implications of this study.

4.2 Critical review of strategic alignment in public procurement

Strategic alignment has its origins in contingency theory (Chandler Jr., 1962; Drazin and Van de Ven, 1985; Ginsberg and Venkatraman, 1985). Contingency theory holds that there is no best way to manage an organisation, and that performance will be enhanced by creating a fit between a variable and the contingency (Spina *et al.*, 2016). Both in public management and the public procurement literature, contingency theory is often used to study organizational strategy and structure (e.g. Bakker *et al.* 2008; George *et al.*, 2019; Glas *et al.* 2017; Jacobsen and Johnsen, 2020; Meier *et al.,* 2010; Patrucco *et al.,* 2019a, Patrucco *et al.,* 2019b). In this type of research, contingency theory is understood as implying that an organization performs better when its structure is properly aligned with both its strategy and the context within which it operates (Patrucco *et al.,* 2019a).

However, investigating this 'strategy – structure fit' is not the only way to perceive contingency theory. Another understanding of contingency theory concerns aligning the various strategies, both internal and external to a public sector organization, across multiple hierarchical strategic levels (e.g. Patrucco *et al.,* 2017a). These hierarchical levels range from the macro-level (e.g. governmental or organizational strategies) to the micro-level (e.g. the contract awarding strategy for a given tendering procedure). This perspective on strategic alignment can be characterized as a 'strategy – strategy fit'.

Public management research on the strategy – strategy fit is scarce. Rather than analysing how overall strategies are operationalized, research has focused on characterizing the overall content of a public agency's strategy in terms of generic strategic stances and actions (e.g. Andrews *et al.*, 2009; Boyne and Walker, 2004; Edwards *et al.*, 2016; Hodgkinson and Hughes, 2019; Poister *et al.*, 2010). This is despite the general idea of strategizing being to explore how aspirations can be actually achieved in a given context (Bryson and George, 2020). This requires the operationalization of the overall strategy content if strategies are to be implemented, and thus achieve goals and create public value (Moore, 1995).

The strategy – strategy fit is also a relevant perspective because it has a strong connection with the New Public Management (NPM) principles identified in previous research (Alonso *et al*., 2015; Gruening, 2001; Hood, 1991). It relates in particular to NPM's adoption of strategic management, which has recently been defined as 'an approach to strategizing by public organizations or other entities which integrates strategy formulation and implementation, and

typically includes strategic planning to formulate strategies, ways of implementing strategies, and continuous strategic learning' (Bryson and George, 2020, p. 13).

This study thus aims to clarify how strategic alignment, interpreted here as the strategy – strategy fit, can be demonstrated in the public procurement process. This process has been described as a range of activities, including bid design, bid evaluation and negotiation, contract awarding, and contract management (Patrucco *et al.*, 2017b). The framework developed by (Patrucco *et al.*, 2017a) is the only one we have identified that conceptualizes strategic alignment in relation to the public procurement process and, therefore, this serves as the main basis for the present paper.

Patrucco *et al*. (2017a) propose assessing the strategic alignment of a public procurement strategy along four dimensions:

- Vertical: alignment with broader political strategies;
- Horizontal: alignment with departmental strategies;
- External: alignment with the supply market;
- Internal: alignment across the five pillars of a public organization's strategy: its (1) make-or-buy strategy, (2) organizational strategy, (3) category strategy, (4) process strategy and (5) awarding strategy.

Of these, the internal dimension is of prime interest for the present paper, with at least pillars (4) process strategy and (5) awarding strategy being clearly related to the procurement process. The process strategy defines how procurement activities are executed, and the awarding strategy how suppliers are selected and contracts awarded (Patrucco *et al.,* 2017a). Procurement activities such as bid design, bid evaluation, negotiation and awarding (Patrucco *et al.,* 2017b) are affected by these strategies.

Notwithstanding the merits of this framework, it lacks conceptual clarity. The first and main problem is that conceptual clarity is lacking with regard to the process of how strategic alignment can be created (Venkatraman and Camillus, 1984). Venkatraman and Camillus (1984) distinguish the *elements* that need to be fitted together to achieve the desired configuration from the *process* of arriving at that configuration. While the framework by Patrucco *et al.* (2017a) identifies elements of fit (strategies on multiple levels and dimensions), it does not seem to address the process of achieving alignment. In other words, while the framework indicates *that* certain strategies need to be aligned, it does not explain *how* this can be achieved, nor how the outcome of this process can be demonstrated. Overall, it thus remains unclear exactly what constitutes alignment, and how it can be achieved.

The second conceptual problem is that there is no clear interpretation of strategy in the framework by Patrucco *et al.* (2017a). Strategy is inherently an ambiguous term. Five different meanings (plan, pattern, position, perspective and ploy) can be attributed to strategy, and it can further not only be intended or realized, but also unrealized or emerging (Mintzberg *et al.*, 2009). Patrucco *et al.*'s (2017a) framework appears to assume a 'cascade' of strategies (Poister *et al.,* 2010) down through the organization, and that these strategies refer to plans. However, it is

unclear whether other meanings or types of strategy would require different conceptual approaches. For instance, some researchers take a more dynamic view on strategic alignment by measuring the extent to which procurement plans are continuously adapted to changes in strategic planning (Søgaard *et al.,* 2019). Clarity on this point is critical because it determines the applicability of the framework.

The third conceptual problem is that the perspective from which alignment is assessed is unclear. It has been argued that public procurement cannot be considered strategic if it ignores the role of politicians (Murray, 2009). That is, the political perspective constitutes a relevant perspective. However, there are other relevant perspectives since the procurement process involves various types of staff and management levels. Identifying the perspective is important because it is unlikely that politicians, managers, public buyers and researchers will all assess alignment in exactly the same way. For instance, based on private sector purchasing research, procurement officials have a more tacit understanding of the alignment concept than researchers and describe their strategies as being based on several contingencies including internal, external, technological and product- or supply-based factors (Søgaard *et al.*, 2019). Perspective thus clearly matters.

The final conceptual problem identified is that Patrucco *et al.*'s (2017a) framework lacks a central proposition. That is, why should the framework's particular form of alignment be striven for? For instance, the form of strategic alignment proposed by Baier *et al.* (2008) is argued to result in superior financial performance for the strategic business unit. However, how Patrucco *et al.* (2017a) perceive performance and the supporting central proposition remains unclear. Performance in itself is also a concept that requires clarification (Andersen *et al.,* 2016). It is therefore ambiguous what form of performance gain could be expected if alignment as proposed by Patrucco *et al.* (2017a) was achieved. This problem is exacerbated by the framework's ambiguity with regards to the general distinction between strategy formation and implementation (Mintzberg *et al.*, 2009). Given that the framework's internal domain seems to pertain to strategy formation only, it follows that alignment with procurement process activities in the contractual phase (e.g. contract management) is not considered. Clarity on this point is important because strategy implementation is frequently the graveyard of strategy (Grundy, 1998). Performance can only be related to strategy formation if the strategy is implemented (Poister *et al.,* 2010).

To summarize, while strategic alignment is generally seen as an important concept, it is unclear how the strategic alignment concept can be usefully applied in the specific context of the public procurement process. Further clarification is required to create a more workable application of the concept.

4.3 Framework development

To create greater clarity with regards to strategic alignment in the public procurement process, the present study develops an analytical framework that builds on the strategy dimensions and the notion of multiple levels of strategy proposed by Patrucco *et al.* (2017a). Improved conceptual clarity is sought in two ways. First, several of the ambiguities identified above can be clarified by explicitly stating one's position. For example, the scope of our framework concerns only part of the strategic management process as defined by Poister *et al.* (2010). As will be explained later, it includes plan formulation and strategy content, but excludes strategy implementation. Second, conceptual clarity can be sought by descending the 'abstraction ladder' (Hayakawa and Hayakawa, 1991) with respect to the interpretation of strategy. Unless strategy in the context of the public procurement process is concretized, it is difficult to turn abstract thought into action. Therefore, our framework applies the notion of procurement instruments (Plantinga *et al.,* 2019) to concretize strategy. Finally, our framework is developed through a narrative literature review that questions how alignment between procurement instruments and higher level strategy can be demonstrated.

At the heart of our analytical framework is the assumption that strategy, in the sense of 'a plan' (Mintzberg *et al.,* 2009), essentially comprises two elements: 1) reasoning and 2) decision-making on competing priorities. Both reasoning and decision-making involve multiple levels and dimensions of strategy. Consequently, strategic alignment can be understood as the consistency of reasoning and decision-making on competing priorities across multiple levels of strategy. These notions of reasoning, decision-making and consistency are further elaborated below. However, given that these are viewed against a conceptual background of multiple levels of strategy, this background is first clarified.

4.3.1 Multiple levels of strategy

In both the public and private sector procurement literature, procurement strategy is perceived as a hierarchy of strategies rather than one all-encompassing strategy (Hesping and Schiele, 2015; Murray, 2009; Patrucco *et al.*, 2017a; Patrucco *et al.*, 2017b). A hierarchy of strategy development stages emerges when general strategy is disaggregated into executable and controllable activities (Hesping and Schiele, 2015). However, the various procurement strategy levels distinguished in the private sector purchasing literature (Hesping and Schiele, 2015) differ from those in the public sector procurement literature (Patrucco *et al.*, 2017a). The present study does not expand on these differences, but simply assumes that some kind of strategy hierarchy is present that ranges from high-level governmental and ministerial strategies, down through the public client's organization, to concrete operational strategies to run the tendering procedure. Also, in contrast to the framework by Patrucco *et al.* (2017a), this study does not refer to the base level of procurement strategy in terms of a process or awarding strategy, but in terms of the *reasoning* and *decision-making* behind procurement instruments.

4.3.2 Reasoning

Viewed from an operational perspective, the essence of public procurement boils down to enacting tendering procedures for specific sourcing projects. Without this, all other activities in the procurement process are in vain. It follows that, on the operational level, the internal domain of strategic alignment (Patrucco *et al.,* 2017a) involves the use of concrete procurement instruments in a given tendering procedure.

It has been argued that practitioners develop reasoning with regards to the functioning of such procurement instruments (Plantinga *et al.*, 2019). This paper builds further on this notion by positing that, at the operational level, strategic alignment, in terms of the *elements* that need to be fitted together to achieve the desired configuration (Venkatraman and Camillus, 1984), concerns this reasoning over procurement instruments.

For example, if a public client aims to contribute to its strategic sustainability goal through a particular sourcing project, it may decide to include a carbon dioxide (CO2) reduction criterion in the contract awarding criteria. This criterion then needs to be supported by a procurement instrument that defines a CO2 reduction measurement (e.g. Rietbergen and Blok, 2013) such that bidders can be scored in an objective and transparent manner. Strategic alignment then amounts to the sustainability strategy being operationalized through a CO2 reduction procurement instrument. The consistency between the two can be substantiated because the reasoning behind this particular procurement instrument is that it helps to reduce CO2 production in the supply chain.

4.3.3 Decision-making on competing priorities

In the private sector, researchers have described strategic alignment as the fit between business strategy and competing purchasing priorities. The latter refer to managerial objectives, such as cost, quality and innovation, that may be set on several organizational levels, and whose simultaneous pursuit inherently implies making trade-offs (Baier *et al.* 2008). In the public sector, the competing priorities include a wider range of objectives. For instance, Erridge and McIlroy (2002) identify three main sets of public procurement goals: commercial (e.g. cost and quality), regulatory (compliance with public procurement legislation) and socioeconomic (e.g. employment, social inclusion and sustainability).

According to Glas *et al.* (2017), the existence of different goals calls for prioritizing and a substantial awareness of possible conflicts among them. How strategic priorities, and conflicting goals, are perceived depends on the subjectivity of each public procurement organization and its personnel. On the operational level of bid design (selecting current procurement instruments or developing new ones), this suggests that public buyers, or the sourcing team in which the public buyer participates, make trade-off decisions with regards to the instruments that operationalize strategic goals.

Trade-off decisions could involve comparing two alternatives for meeting the same goal, for example using the CO2 reduction instrument or applying sustainability requirements to the

product that is to be procured. Clearly, trade-off decisions can also involve multiple goals. For instance, if a public client aims to contribute to both social and environmental sustainability (e.g. Brammer and Walker, 2011) through a particular sourcing project, it may decide to use a social return criterion in addition to a CO2 reduction criterion. In that case, relative priorities become apparent by the weight attached to each criterion.

4.3.4 Strategic alignment as consistency in reasoning and decision-making

The notions discussed above facilitate a detailed interpretation of the strategic alignment concept. As such, the consistency needed to achieve strategic alignment (Søgaard *et al.*, 2019) can be understood as the extent to which multilevel reasoning and decision-making lead to logical means-and-ends relationships. The previous examples also help to illustrate such consistency over multiple levels. The reason for applying a CO2 reduction procurement instrument is that it will stimulate CO2 reduction in the supply chain. This instrument thus forms a means to the end formulated in the process strategy: that the tendering procedure should contribute to CO2 reduction. In turn, the tender procedure is a means in itself. It is a means to the end that procurement should contribute to CO2 reduction, which in turn is a means to the end that the client organization should achieve environmental sustainability goals.

Consistency in this chain of means-and-ends can be understood in two ways: first, do these relationships follow a logical line of argumentation; second, do alternative logical lines of argumentation better suit the competing priorities? Consistency thus concerns both the reasoning and the decision-making on competing priorities. Assuming that the latter will inevitably require trade-offs, these decisions are also referred to in this paper as trade-off decisions.

4.3.5 Analytical framework

Above, it was argued that, from an operational perspective, strategic alignment concerns the extent that the base-level strategy, i.e. the reasoning behind the design of individual procurement instruments, and the corresponding trade-off decisions fit with those of higher-level strategies. These higher-level strategies may not only concern various levels of procurement strategy but also functional strategies, organizational strategies and political strategies. If all these strategies were perfectly aligned, one could expect a hierarchy of reasoning and trade-off decisions that can be read from top to bottom and from bottom to top. A top-down reading will show *how* achievement of the top-level strategy is supported by the use of certain procurement instruments in a given sourcing project. Reading this hierarchy from bottom to top will show *why* certain procurement instruments are applied in a given sourcing project. The resulting framework is illustrated in Figure 1.

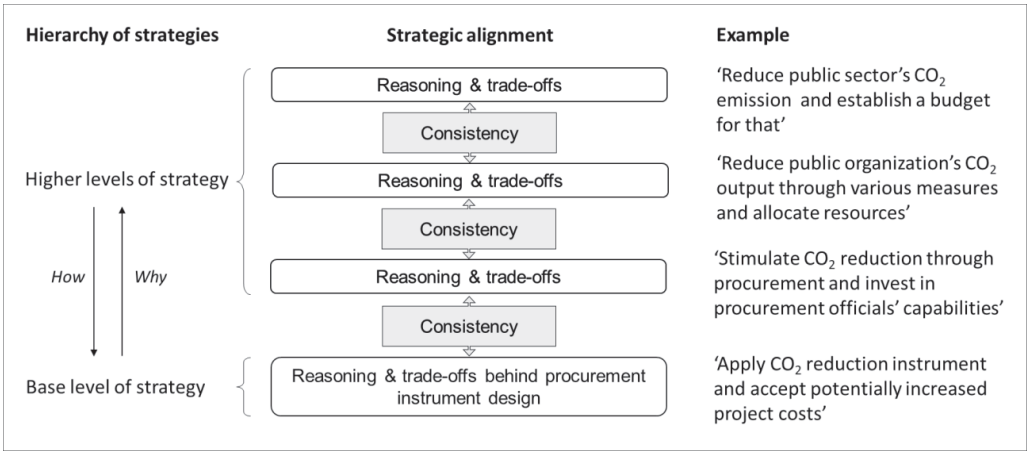

Figure 1: Analytical framework for strategic alignment

The key to establishing strategic alignment is thus identifying these relationships and ensuring they are logically consistent. However, in practice, this is not straightforward. While this paper refers to 'the client' as if it had human-like qualities, clients in reality may be complex organizations with inherent issues of power, conflict and control (Bresnen, 2009). This study therefore employs a Strategy-as-Practice perspective. This perspective holds that it is not only top-management strategists who engage in activities that lead to strategic outcomes (Löwstedt *et al.*, 2018; Whittington, 2006). Rather, multiple practitioners on various levels and dimensions of strategy may make, potentially conflicting, decisions regarding strategy content.

4.4 Framework exploration

4.4.1 Case study

To determine whether the theoretical lens offered by the proposed analytical framework helps to get a grip on strategic alignment and the public procurement process, the framework was applied in practice. The single case study methodology (Yin, 2014) was selected to explore the framework for its ability to provide clear empirical illustrations of reasoning and trade-offs on multiple levels and dimensions of strategy and to demonstrate consistency. Since the study aims to concretize strategy, the case focusses on how the design of the specific procurement instruments used in the tendering procedure for a single sourcing project are consistent with higher level strategies.

Three selection criteria were applied to identify an appropriate case where the particular outcome of interest (strategic alignment) occurs (Dubois and Araujo, 2007). These are that, based on face value, the case should: 1) appear well-aligned; 2) concern a novel procurement system; and 3) involve a relatively straightforward procurement system. The reasons for these three criteria are as follows. First, it was assumed that a well-aligned case would offer the best opportunity to reconstruct the reasoning and decision-making on competing priorities across multiple strategy levels. Second, the first application of a novel procurement system implies a

change from current practice, suggesting that a new strategy will have been devised. This was seen as advantageous because the origins and subsequent formation of a new strategy would probably be easier to reconstruct than those of a long-standing procurement strategy or policy. Third, a relatively uncomplicated procurement system would make it easier to illustrate details concerning the reasoning and competing priorities.

The case selected concerns a public construction client's first application of a procurement system generally referred to as pre-commercial procurement (PCP) (Iossa *et al.*, 2017). PCP is a form used for the public procurement of innovation (Obwegeser and Müller, 2018). In this case, PCP was used in an application concerning level-crossing safety. The organization in question, ProRail, is a major public construction client in the Netherlands that runs hundreds of tendering procedures each year. The PCP tendering procedure met the three criteria mentioned above since it had gained considerable positive attention both within the client's organization and in the media, suggesting that it probably is well-aligned (1). Also, the case concerned the use of procurement instruments that were both novel to the client (2) and rather straightforward (3).

4.4.2 Case description

Level crossings are a crucial safety issue for railway operators and infrastructure managers. Each year, hundreds of fatal accidents at level crossings occur across Europe, and account for one-third of all rail fatalities (Liang and Ghazel, 2018). Most level crossings are protected by either active or passive systems. Active crossings are protected by automated warning systems (flashing lights, barriers etc.) whereas passive crossings provide only a fixed sign, requiring people to stop and look left and right for trains before proceeding.

In 2016, the Netherlands' Ministry of Infrastructure and Environment started a programme to address the high accident rate at passive crossings. The Ministry formulated a twofold strategy. First, the number of passive crossings would be reduced by removing some crossings altogether and by upgrading others to active crossings or installing bridges. Second, because of budget restraints, innovative solutions to increase the safety of existing passive crossings would be stimulated. Based on the philosophy that the testing of concepts speeds innovation ('from talking to testing'), the Ministry defined a timeframe for the testing of new concepts.

The Ministry commissioned the client organization (ProRail) to conduct the programme. Although the client has a broad portfolio of procurement instruments, it was decided to develop new ones for this programme. The development process resulted in a three-stage procedure called 'Proeftuin Nabo', which can be translated as 'testbed for passive crossings'. The goal of this PCP-like procedure was to achieve 'cost-effective solutions that increase the safety of existing passive crossings'.

Stage 1 commenced in April 2016 with a media announcement of the procedure inviting potentially interested parties to respond, and 62 ideas were received. Ideas were submitted not only by some of ProRail's regular contractors, suppliers and consultants, but also by unfamiliar firms and even by some individuals. Evaluation of these ideas by an expert committee led to the selection of 14 promising ideas. In Stage 2, prototypes were developed and evaluated by a

committee of technical and behavioural specialists. This resulted in seven innovative concepts going forward to Stage 3 for testing, which started around January 2017. To test prototypes in a realistic but safe setting, dedicated areas of a goods yard of a supplier of railway components were used. Various users and stakeholders, such as transport safety, cyclist and walker associations, farmers and managers of heritage railways, were invited to test and reflect on the prototypes. The evaluations of the tests were finalized in May 2017. This overall procedure was evaluated positively by its participants, the client and its stakeholders, and received both government and national media attention.

4.4.3 Data collection

Data sources included documents, observations and interviews. The documentation included internal project and contracting documents such as the project plan, the contracting plan and the documentation exchanged during the tendering procedure. It also included a booklet that the client developed after the PCP was finished to highlight the positive results and acknowledge the cooperation of the various people involved. The booklet contains positive reflections by various individuals, such as the project manager, the procurement officer, the Ministry representative, technical and behavioural experts, and representatives of various stakeholders and end-users involved in the PCP (ProRail, 2017). External documents including the Minister's reports to parliament and websites reporting on the case (e.g. the Ministry's procurement expertise centre, national media) were also included. Research observations were made during internal presentations by members of the sourcing team. Finally, after producing an initial draft of the reconstructed strategy, two procurement officers involved in the case's strategy formation process were interviewed to validate and complete this reconstruction.

4.4.4 Reconstruction method

Documents were examined for text elements that could be identified as either reasoning or trade-off decisions. Texts were coded as 'reasoning' if they explain why certain choices were made. For instance, where the PCP design involves an information session, the argument that this 'session will increase the participant's understanding of the client's needs' is viewed as reasoning. Data are identified as 'trade-offs on competing priorities' if the reasoning is accompanied by considerations of the consequences of the preferred option or its alternatives.

It was anticipated that not all the reasoning or trade-off decisions could be retrieved from documents alone. For example, a scarcity of resources might impede identifying reasoning, or a shared understanding in a community of practice could mean that documentation was considered unnecessary. In this research, reasoning is considered as *explicit* if it is documented. In contrast, if there are gaps once the explicit reasoning is included in the analytical framework, these are seen as aspects where *implicit* reasoning took place. Such gaps were identified by checking the chain of means-and-ends for missing links and by validating the implicit reasoning through interviews with the two procurement officers. This research can thus be characterized as adopting the public buyer's perspective, although it should be noted that the procurement

officers were asked to adopt this study's conceptual approach to strategic alignment rather than their own perceptions of the concept.

4.5 Case analysis

This section presents the reconstructed strategies in two parts: first, the strategies leading up to the decision to develop two new procurement instruments and, second, the strategy behind the design of one of these instruments. This division makes it possible to provide a detailed presentation of procurement instrument design as a single level of strategy.

4.5.1 Strategy leading to PCP instrument development

On the next page, table 1 presents a summary of the reconstructed strategy. The rows summarize the strategy content on various levels of strategy. The 'reasoning' column summarizes the main statements that explain how the overall strategy was operationalized. The 'trade-off' column provides additional information by clarifying why the reasoning seemed valid for the actor in question. The 'organization' and 'source' columns show the organizational level at which reasoning and trade-offs were formulated and the primary document in which these were found. The elements marked * in the table are implicit elements used to fill the gaps identified when applying the analytical framework.

Table 1: Reconstructed strategies and strategy levels

Reasoning (* indicates implicit reasoning)	**Trade-off in competing priorities**	**Organization**	**Source**
Railway safety (including level-crossing safety) is a strategic goal	*Railway safety vs other strategic goals in transport sector	Ministry	Ministry policy
Create programme to target passive crossing (PC) safety, because this lags behind the generally improving railway safety levels.	*PC vs other railway safety issues	Ministry	Ministry programme; Contract plan
Allocate part of the budget for innovative supply-side solutions. because programme budget is insufficient to apply conventional solutions at all PCs.	Conventional PC removal/upgrade vs opportunity to uncover new cost-effective PC safety measures	Ministry	Ministry programme; Contract plan
Commission client to conduct innovation programme with a 'from talking to testing philosophy', since desk studies are ineffective here.	*Client assignment vs other options	Ministry	Contract plan
*Accept innovation programme assignment because railway safety is a strategic goal	* vs other strategic goals (reliable, punctual and sustainable railways)	Client	Client strategy
Perform market research (desk research, consultation with similar public clients, market consultation, concept design) in order to be better able to formulate the demand, identify potential suppliers, inspire and quickly inform potential suppliers on relevant state-of-the-art technology	*Staff resources vs expected level of innovation effectiveness and risks	Client project team	Contract plan
Approach market in two stages (first innovation testing, then direct tendering) because PC safety is too complex and risks are too high to directly tender for innovations.	Risks and resources related to single tender vs multiple tenders	Client sourcing team	Contract plan
*Develop new procurement instruments since nothing in the current portfolio is appropriate for testing PC innovations.	*Development process risks vs possibility of creating successful approach	Client sourcing team	(Research)
*Develop new procedure document and contract on the basis of three currently used procurement instruments	* Select and customize current instruments vs start from scratch	Client sourcing team	(Research)

Table 1 displays a hierarchy of strategies that was reconstructed from various documents stemming from two organizations: the Ministry and the client (ProRail). If read from top to bottom, the reasoning in the first column can largely be linked logically by adding ‘therefore’.

This reading indicates how top-level strategy is achieved. If read from bottom to top, the next level up shows why procurement instrument development seems logically consistent.

4.5.2 PCP design

Table 2 summarizes the strategy behind the document that describes the PCP *procedure* in terms of the major design choices (first column), and the corresponding reasoning (second column) and trade-offs (third column) that explain these design choices. The PCP *contract*, another procurement instrument developed in this programme, is not elaborated further in this paper. In contrast to Table 1, the rows in Table 2 represent various aspects of the PCP procedure design rather than distinct strategy levels.

Table 2: PCP procedure design with reconstructed reasoning and trade-offs

PCP procedure design features	**Reasoning** (* indicates implicit reasoning)	**Trade-off in competing priorities**
*General feature: Concise and easy-to-understand PCP tendering procedure document (and contract)	*Make PCP accessible to inexperienced tender participants	*Staff resources vs PCP effectiveness
PCP Phase 1: concept selection		
a. Attract attention in multiple ways (other forms of communication in addition to EU publication)	Expand market attention beyond 'the usual suspects'	*Staff resources vs level of publicity
b. Information session	Increase participants' understanding of client's needs	*Staff resources vs PCP effectiveness
c. Select six innovative concepts for two solution categories (two-page concept descriptions; award criteria: cost, innovation, safety, impact)	1. Create a set of solutions, since no single solution will suit all PCs. 2. Select multiple participants to maintain post-PCP competition	*Staff and budget resources vs PCP effectiveness and future opportunities
PCP Phase 2: prototype development		
a. Close PCP contract and pay fixed compensation for prototype development	1. Secure legal aspects 2. Reward participants' efforts	*Budget resources vs PCP effectiveness
b. Select three prototypes per category for testing (same award criteria as in 1c)	(As PCP phase 1c.)	(Same as for 1c.)
PCP Phase 3: prototype testing		
a. Provide test facilities	1. Reduce uncertainties regarding solution feasibility, safety issues and stakeholder acceptance 2. Provide client and end-user feedback on prototypes to the suppliers	*Staff resources vs PCP effectiveness
b. Pay fixed compensation for participant expenses	Reward participants' efforts	*Budget resources vs PCP effectiveness
c. Determine feasibility of solutions and (if applicable) develop requirement specifications	Gain valuable knowledge on what works (and not), and why, for potential future requirement specifications	*Staff resources vs PCP effectiveness

Table 2 illustrates that decision-making over competing priorities occurs on the procurement instrument design level as well as on other strategy levels, and that it concerns a variety of aspects throughout the PCP design procedure. In many cases, the trade-offs involve staff resources since the interviews with the procurement officials highlighted that staff resources was a critical issue. Members of the sourcing team continuously had to weigh spending time on this PCP project against other sourcing projects.

4.5.3 Assessment of strategic alignment

Tables 1 and 2 summarize and structure the various strategies. The interviewed procurement officials saw the tables as making explicit what was already clear to them in a more implicit manner, namely that there was a high level of consistency in the reasoning and trade-offs between the various strategy levels and the PCP procedure design.

For the outsider, unfamiliar with procurement practice, the consistency between the PCP procedure design and higher levels of strategy is probably less evident, since knowledge of potential alternative design choices and consequences is necessary to assess the consistency. However, a fair level of consistency is apparent when the top-level strategy reasoning is compared with the reasoning behind the procurement instrument design. The top-level strategy can be traced back to the Ministry's twofold strategy of continuing to reduce the number of passive crossings while also allocating part of the budget to innovation. While the Ministry did not dictate how to achieve innovation in level-crossing safety, its basic philosophy of going 'from talking to testing' seems to have been a prominent driver in the strategy formation process. The PCP procedure design choices made illustrate how this top-level strategy eventually unfolded in a concrete procurement instrument that is clearly targeted at gathering, developing and testing innovative concepts. Its design facilitates the overall notion that it is only through the client and divergent end-user groups testing innovative concepts that the complexity of enhancing passive crossing safety will be better understood. As such, the detailed reasoning behind the procurement instrument design logically connects with the mid- and top-level reasoning.

The trade-offs in terms of competing priorities address the second element of strategy identified in this study. From an outsider's perspective, one can simply conclude that, with hindsight, the trade-offs in terms of competing priorities were apparently sufficiently aligned to result in new and ready-to-use procurement instruments.

4.6 Discussion

Selecting public procurement as its general domain, this study develops an analytical framework and applies it in a case study to examine how a strategy – strategy fit can be demonstrated. As such, this study responds to the call by Höglund *et al.* (2018) to do more research on strategy practices in the public sector and to provide case studies on a micro-level of analysis.

One merit of this study's approach is that it provides an empirical example of how public procurement can indeed be used as a strategic instrument and a lever for achieving governmental policy goals (OECD, 2019). The case study demonstrates consistency across

multiple levels of strategy, thus providing evidence that a political 'from talking to testing' strategy resulted in new, pre-commercial procurement instruments that were designed to gather and test innovative ideas for improving passive crossing safety.

Nevertheless, given the aim of this study, the main question here is to what extent the framework and case study contribute to greater conceptual clarity on the strategic alignment concept. Scrutinizing the framework of Patrucco et al. (2017a), this study identified several issues that needed further clarification. The most important issue is that the existing literature is unclear about the process of creating alignment between multiple levels of strategy. The present study clarifies this issue by demonstrating that 'strategy' can be usefully conceptualized in the form of reasoning and trade-off decisions, and that the consistency needed to create 'strategic alignment' concerns the extent to which the reasoning and trade-off decisions on multiple levels and dimensions of strategy are logically related. Consequently, this study also sheds light on the alignment creation process itself in that it appears that this process in essence involves the verification of consistency between strategy levels before the reasoning and trade-off decisions on an individual level are finalized.

Given that this study concerns a specific case, this raises questions about the generalizability of the findings. Since the aim of this study was to explore how strategic alignment can be demonstrated in a public procurement process, its value should be assessed in terms of the extent to which it can be analytically generalized to other situations (Yin, 2014). In contrast to Patrucco et al. (2017a), this study does not assume predefined levels of strategy. This has both advantages and disadvantages. A major advantage is that the reasoning and trade-off decisions used to demonstrate consistency do not need to fit the structure of Patrucco *et al.*'s (2017a) strategy framework. For instance, the lack of a 'category strategy' does not necessarily mean that a public organization has a missing link in creating strategic alignment. The present study's analytical framework is thus more flexible. However, the associated disadvantage is that the framework offers little guidance on where to look for strategies, nor how the operationalization of overall strategy can be sensibly organized.

There are other limitations to this study that also need to be considered, some of which are related to the issues identified above. These issues concern the interpretation of strategy, the demarcation of the strategy process, and the perspective from which alignment should be assessed. First, although this study presents an example of strategy as a plan that was both intended and realized (Mintzberg et al., 2009), it does not elaborate on the framework's applicability if strategy was interpreted differently. Second, this study only investigates strategy formation, which in this case study ends with the finalized procurement instrument design. Strategy implementation is thus excluded. Given this demarcation, this study does not help clarify how the performance concept (Andersen *et al.,* 2016) should be understood or how it relates to strategic alignment. Third, this research only considers the perspective of the public buyer, and the perspectives of other involved officials may be equally relevant.

Another limitation is that this study's reconstruction of strategic alignment is somewhat subjective. While research on strategic alignment in procurement is usually based on respondents' perceptions (Søgaard *et al.,* 2019), here the reasoning and trade-off decisions were initially established by the researchers and only then verified by the procurement officials involved in the project. Also, assessing the level of alignment between the higher-level strategies and the procurement design involved expert judgement rather than cold logical reasoning. Knowledge of potential alternative design choices given specific supply market characteristics is needed for proper assessment. ,. Finally, it should be noted that while the logic required to demonstrate consistency in reasoning is reasonably verifiable by an outsider, this is much less so when it comes to trade-off decisions. Nevertheless, the reconstructed trade-offs provide concrete examples of the choices facing 'strategists' (Whittington, 2006) on multiple levels. These range from individual considerations regarding spending working hours on this project, as against other projects, to ministerial considerations on budget allocations. Even for the insider, knowledge of the specific contexts within which trade-off decisions are made is probably inherently vague since the trade-offs may concern a mix of priorities on individual, group and organization levels. Therefore, while achieving coherence across competing priorities on multiple levels of strategy is an essential factor in achieving strategic alignment, it is also a very subjective factor to assess.

The study's main implication for practice is that creating a strategy – strategy fit involves the deliberate verification of consistency between reasoning and trade-off decisions on multiple levels of strategy. Interestingly, given that alignment had to be reconstructed in this case study, it appears that it was, to an extent, achieved organically rather than deliberately. At least, no specific strategic management tools (Höglund *et al.,* 2018) were used to assess alignment while the strategy unfolded, and responsibility for proactively establishing or monitoring alignment was not explicitly allocated. In similar situations, this study's conceptual framework could be used by practitioners as a tool to deliberately create, assess or demonstrate strategic alignment.

Also, this seemingly organic achievement of alignment seems to indicate that monitoring alignment during the operationalization of strategy requires a distinct routine, one that should make all the reasoning and trade-off decisions involved explicit. Theoretically, this is supported by the concept of procedural rationality (Kaufmann *et al.*, 2012; Simon, 1978), which has been defined as 'the extent to which the decision process involves the collection of information relevant to the decision, and the reliance upon analysis of this information in making the choice' (Dean Jr and Sharfman, 1993, p. 589). Procedural rationality implies that both the reasoning and trade-off decisions should be made in a more explicit manner.

4.7 Conclusions

Applying the strategic alignment concept to the public procurement process is not straightforward due to a lack of conceptual clarity. Focussing on the fit between the various strategies of a public sector organization and procurement instrument design, this paper argues that strategic alignment is constituted by a logical chain of reasoning and trade-offs between

competing priorities on multiple strategic levels. As such, strategic alignment can be demonstrated by identifying, explicating and logically linking these two elements of strategy content across the various levels of strategy.

Given the exploratory nature of this study, research is needed to further investigate the strategy – strategy fit in public management. First, by clarifying how strategic alignment can be demonstrated, it offers a basis to investigate how the interaction of multiple actors can lead to such alignment. Second, given that this study is limited to the strategy formation phase, future research could clarify how alignment between key procurement process activities in the implementation phase, such as contract management, and strategy can be demonstrated. Third, future research is required to clarify the performance construct, so that the supposed increase in performance that is generally associated with strategic alignment can be measured. Fourth, having developed an analytical framework for the public procurement context, future research could usefully assess the extent to which it is appropriate for other government functions.

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Chapter 5

Creating strategic alignment during the development of procurement instruments

Abstract[4]

Purpose *– It is generally acknowledged that creating strategic alignment is key to achieving good procurement performance. However, when it comes to aligning procurement instruments with an organization's strategic goals, the literature is unclear about exactly how such alignment can be created in practice.*

Design/methodology/approach *– Focussing on the process of procurement instrument development by public clients in the construction industry, this research explores how alignment with strategic goals can be created. Since procurement instrument development is portrayed in the literature as a highly intuitive and subjective process, this research examined how public clients can rationally and objectively create strategic alignment during this development process.*

Findings *– The results indicate that the rational and objective creation of strategic alignment requires the reasoning behind procurement instrument design to be made explicit and linked to the reasoning behind higher level strategies. Since this can easily become complex, practitioners should master practical tools such as causal mapping to manage the complexity effectively.*

Originality/value *–This paper presents an Action Research case study on the development of a new procurement instrument. By interpreting strategic alignment as coherence in reasoning between procurement instrument design and multiple levels of strategy, it explains how several research interventions eventually resulted in creating alignment in practice.*

Keywords: Contracting; Management; Procurement.

5.1 Introduction

Creating strategic alignment is generally considered essential for achieving good procurement performance (e.g. Baier *et al.*, 2008; Glas *et al.*, 2017; Patrucco *et al.*, 2019; Rodríguez-Escobar and Gonzalez-Benito, 2017; Søgaard *et al.*, 2019). The concept of strategic alignment is based on contingency theory (Drazin and Van de Ven, 1985; Spina *et al.,* 2016) and is used to study the consistency of, for example, procurement strategies and activities with organizational objectives (Søgaard *et al.*, 2019).

While the general procurement literature is clear about the relevance of creating strategic alignment, it is less clear about *how* it can be created in practice. This is the situation with public clients in the construction industry that form our subject of interest. Although there is abundant construction management literature on selecting the appropriate procurement approach, this

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seems to ignore, or only implicitly employ, the strategic alignment concept (e.g. Love *et al.*, 2012; Watermeyer, 2012; Naoum and Egbu, 2016).

In particular, the construction management literature is unclear as to the importance of aligning procurement instruments with an organization's strategic goals. The literature lacks both theoretical insights as well as knowledge of current practice about how such alignment can be achieved. Since this gap potentially hinders improvements to procurement performance, this issue needs to be addressed.

This paper investigates how strategic alignment between procurement instruments and organizational goals can be created in practice. It does so by focussing on the phenomenon that public clients not only use existing procurement instruments but also develop new ones (Plantinga *et al.*, 2019). This phenomenon is particularly significant since it suggests that public clients see a need to invest in the self-development of procurement instruments in addition to adopting instruments developed elsewhere, such as the NEC3 suite of contracts. Since this apparent need suggests a perceived opportunity to increase procurement performance, this development process is highly relevant for the public client.

However, previous research indicates that, in practice, procurement instruments are often developed in a highly intuitive and subjective process, involving few theoretical or empirical considerations (Ballesteros-Pérez *et al.*, 2015). Given this characterization of the procurement instrument development process and the generally acknowledged need to create strategic alignment, it would seem that procurement performance could be improved by investigating how the alignment construct can be applied in this particular process. Therefore, the specific purpose of this research has been to examine how public clients can rationally and objectively create strategic alignment during the procurement instrument development process.

5.2 Literature review

Previous research has recognized the relevance of creating strategic alignment in both private (Baier *et al.*, 2008; Rodríguez-Escobar and González-Benito, 2017) and public (Patrucco *et al.,* 2017; Patrucco *et al.,* 2019) procurement. The central proposition of strategic alignment is that the performance of an organization is determined by the alignment or fit between two or more factors such as strategy, structure, technology or environment (Meskendahl, 2010; Schoonhoven, 1981).

Patrucco *et al.,* (2017) propose a framework that appears to reflect current academic thinking about strategic alignment with regards to the public procurement process. This framework conceptualizes alignment between public procurement strategies and four specific dimensions of the environment: broader political strategies; departmental strategies; the supply market; and the public organization's internal strategies.

However, despite the framework's merit of emphasizing *that* certain strategies need to be aligned, it is unclear about *how* such alignment can be created in practice. This is especially true when it comes to the operationalization of procurement strategies. What constitutes, in

practice, alignment between, say, an awarding strategy and an organizational strategy? (Patrucco *et al.,* 2017). How can the public buyer, or sourcing team, demonstrate that their tender dossiers align with higher lever strategies? The current literature offers no answers to these questions.

This uncertainty is aggravated by the general lack of agreement in the research community on what should form part of the alignment construct. Søgaard *et al.* (2019) showed how researchers use various interpretations of alignment. They also observed that while researchers generally rely on practitioners' perceptions, these practitioners have a somewhat tacit understanding of the alignment construct rather than adopt the procedural understanding generally assumed in academic literature. Finally, Søgaard *et al.* (2019) highlight the lack of agreement on how to measure alignment. For instance, they note that some researchers measure alignment using the procurement function's knowledge of the organization's strategic goals, whereas others measure the adaptation of procurement plans in response to changes in strategic planning (Søgaard *et al.,* 2019).

To sum up, it is unclear how strategic alignment between procurement instruments and higher level strategies can be created because the literature lacks both theoretical insights and knowledge of current practices in this respect.

5.3 Conceptual approach

5.3.1 Operationalization of the strategic alignment construct

Given the lack of agreement on what should be in the strategic alignment construct, it is important to first clearly define how the construct is operationalized in the present study. Rather than terms like 'process strategy' and 'awarding strategy' as used by Patrucco *et al.* (2017), the present study employs the term 'procurement instruments' when theorizing about what exactly constitutes strategic alignment at the operational level of public procurement. Previous research has similarly employed this term to refer to the methods, systems and documents used in the procurement process (Plantinga *et al.,* 2019). Contracts, supplier selection methods and contract award systems are examples of such procurement instruments. The advantage of applying this term is that it refers to the concrete documents and texts that are actually used in a given tendering procedure, whereas a process or awarding strategy may not be written down in a document and the content that these terms refer to may be interpreted in various ways.

The present study follows the framework of Patrucco *et al.* (2017) in its implicit assumption that procurement instruments need to be aligned with the four dimensions of their environment. It is logical to treat both procurement strategies and procurement instruments in the same way since procurement instruments constitute the operational means to implement procurement strategies and therefore concern the same 'content of fit' (Venkatraman, 1984).

With regards to the question of what exactly constitutes alignment between procurement instruments and higher levels of strategy, this study employs the following perspective. It views

strategic alignment in terms of logically valid relationships between the reasoning and trade-off decisions behind the design of procurement instruments on the one hand, and the strategies present related to Patrucco *et al.*'s (2017) four environmental dimensions on the other. Similar to the way in which a causal map may represent a strategic plan (Bryson *et al.,* 2004), a procurement instrument can be considered as well aligned if the corresponding reasoning and trade-off decisions form clear and logically valid means-and-ends relationships with the reasoning and trade-off decisions on these four dimensions.

In addition, this study views the *creation* of alignment as an iterative process. In this process, instrument design features are adjusted, added or removed in correspondence with ongoing validity assessments of the relationship between the reasoning and trade-off decisions behind instrument design on the one hand, and those of higher level strategies on the other.

5.3.2 Explication of procurement reasoning

Ideally, all relevant reasoning and trade-off decisions would be documented, since this would facilitate assessment of the validity of the relationships. However, in practice this may often not be the case. The writing down of reasoning may be incomplete or scattered across multiple formal and informal documents, and therefore be difficult to retrieve. When it comes to the reasoning that was only verbally expressed, one needs to find the involved practitioners and rely on their recollections. Finally, some parts of the reasoning may not have been expressed at all. It is therefore highly likely that, in practice, parts and elements of the means-and-ends relationships will vary on an implicit-explicit scale. To enable completion and assessment, these implicit parts of the reasoning require explication.

Furthermore, the level of implicit reasoning is probably affected by the characteristics of the process by which procurement instruments are developed. Perhaps, the more intuitive and subjective this process is run, the more implicit will be the reasoning and trade-off decisions that determine procurement instrument design (from here: Procurement Reasoning (PR)). Therefore, it is likely that procurement instrument development processes need a more rational approach to create favourable conditions for the PR to be explicated.

This study employs the general notion of tacit knowledge (Polanyi, 1966) to conceptually approach the explication of implicit reasoning. It has been argued that tacit and explicit knowledge form the two ends of a continuum (Nonaka and von Krogh, 2009). While purely tacit knowledge cannot by definition be turned into explicit knowledge, lesser forms of tacit knowledge can be made explicit through articulation and externalization (Nonaka and von Krogh, 2009). This study therefore assumes that some tacit forms of reasoning, such as intuitive practitioner knowledge on the effects of a procurement instrument, need to, and can be, turned into explicit reasoning before assessing strategic alignment.

5.3.3 Analytical model

The conceptual approach elaborated above is summarized in the following model. A procurement instrument is considered highly strategically aligned if the PR forms logical and

coherent chains of means-and-ends relationships with, ultimately, goals formulated on the four environmental dimensions: political, departmental and internal strategies plus the supply market. Ideally, the reasoning and trade-off decisions on all these levels and dimensions are documented. However, in an intuitively and subjectively run development process, the assessment and improvement of strategic alignment may be hampered by implicit reasoning. To enable assessment of strategic alignment, this implicit reasoning needs first to be explicated. Figure 1 illustrates the study's analytical model.

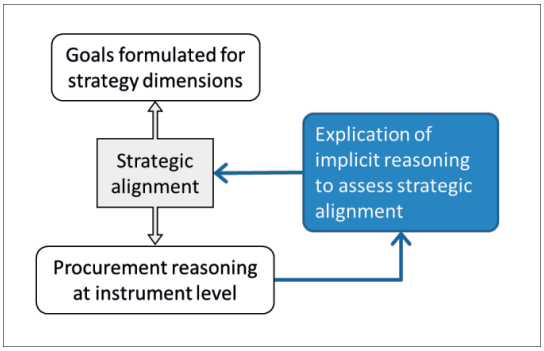

Figure 1: analytical model

5.4 Research approach

This research is set in the procurement department of a major public construction client in the Netherlands. The research was commissioned by the department manager in order to gain a tighter grip on the current practice in handling procurement instruments. The development of new procurement instruments was given particular attention, because the development process seemed the least manageable of all the procurement instrument handling processes present in the department.

5.4.1 Methodology

To explore how the development process was enacted in the department, an Action Research (Azhar *et al.,* 2010) case study was undertaken on one of the more complex procurement instrument development processes ongoing at that time. Case research is appropriate for answering how and why questions that focus on contemporary events where there is no control over behavioural issues (Yin, 2014). Case research is also appropriate for producing exemplars (Flyvbjerg, 2006) and is particularly appropriate for this research topic since there is virtually no literature on the procurement instrument development process. The external validity of case studies can be based on analytical generalization, which refers to the logic through which case study findings can be extended to situations beyond the original case study, based on the relevance of similar theoretical concepts or principles (Yin, 2014). Analytical generalization thus contrasts to statistical generalization where, based on statistical inference, findings from a sample are claimed to apply to its universe.

This research has employed the single-case approach in order to study the same case at multiple points in time (Yin, 2014). This longitudinal approach was appropriate because the researchers had agreed to help improve the client's current situation through research interventions. To do so, the researchers applied the method of Action Research (AR). This method is appropriate for addressing 'real-life' problems and bringing about change in specific contexts with the dual goals of making improvements and of generating knowledge (Connaughton and Weller, 2013). In the construction research community, AR has, on the one hand, been criticized in relation to its replicability, reliability, generalizability and objectivity but, on the other hand, it is also recognized for helping to close the gap between theory and practice and for improving the relevance and impact of academic research through its proactive nature (Connaughton and Weller, 2013).

The present study utilized a five-step AR cycle: 1) diagnosing, 2) action planning, 3) action taking, 4) evaluating and 5) specifying learning (Azhar *et al.,* 2010). Diagnosing amounts to identifying the primary research problem(s). Action planning establishes the target for, and approach to, change. In the action-taking step, researchers and practitioners collaboratively intervene in the practitioner's organization to cause certain changes. Evaluating involves determining whether the theoretical effects of the action were realized. Although, formally, specifying learning is the final step, in practice it is usually a step in an ongoing circular process (Azhar *et al.,* 2010).

The research team consisted of four people: three researchers and the procurement officer responsible for running the development process. The latter is referred to in this paper as the Procurement Instrument Developer (PID). Given that the joint interpretation of results is held to provide validity (Connaughton and Weller, 2013), the PID was actively involved in all five AR steps.

Being responsible for development progress, the PID collected and created documentation, organized meetings and reported to management. The PID involved a group of about ten peer practitioners in the development process, mainly for discussion and validation purposes.

The researchers had the opportunity to join up with the PID in an early phase of the development process. The first author of this paper (from here: author1) attended nine practitioner meetings organized by the PID at the procurement department during a time period of seven months. Data were gathered by author1 in the form of interviews of involved procurement officials, external and internal client documents (reports, memos, emails) and meeting observations. These observations were documented in field notes. Procurement officials were typically interviewed shortly after a development process meeting had taken place. The goal of these interviews was to question the meeting participants individually and compare their inputs. Interviews had a semi-structured format, using a fixed set of questions and taking the opportunity to inquire further when considered necessary. Questions primarily dealt with a participant's reasoning on the new procurement instrument and potential issues that impeded delivering such reasoning. In total, 14 interviews were held. These typically lasted one hour and were audio-recorded and later transcribed and coded.

The second author took part in some of the development process meetings to gain a personal frame of reference for when discussing steps in each AR cycle. The third author did not take part in these meetings in order to safeguard objectivity during the AR cycles.

Since the AR intervened in an ongoing development process, and explication and linking of the reasoning was best observable during PR discussions in practitioner meetings, the AR cycles were defined by the extent to which interventions had resulted in satisfactory effects in later meetings. The AR cycles were therefore delineated by the meetings organized during the development process.

5.4.2 Case description

The development process in question concerns the development of a new qualification system. Since this instrument is being developed by a public client in the Netherlands, it has to comply with the general European regulations on public procurement (Bovis, 2012) and so it is best to define it in terms of that legal framework. The European Utilities Directive describes a qualification system (QS) as an option for particular types of public clients. A QS offers the opportunity to select potential suppliers for a period of time and a certain scope of work, rather than having them re-qualify for each tendering procedure (article 77, directive 2014/25/EU).

In our case organization, a PID was assigned to develop a vision for a new QS. The client's current QS was established more than 20 years ago and used to prequalify suppliers for six segments, such as the daily maintenance of the tracks, and the design and installation of train signalling systems and power supplies, that are key for the functioning of the railway system,. With over 100 suppliers listed in the QS, this procurement instrument was highly relevant to the public client.

Over time, the QS had undergone some considerable changes but, recently, the department's management had decided that the current QS design should be fundamentally reconsidered. Management selected a specific PID for this task because of his extensive knowledge of the current QS.

The first stage of the procurement instrument development process was vision creation. Following management approval, the next stages would involve detailing the vision and implementing it in practice.

5.5 Results

In the past, AR papers have been criticized for not being entirely clear as to what 'interventions' (actions) were being introduced, observed, reflected upon and used as a basis for a further AR cycle (Connaughton and Weller, 2013). To address these concerns, the individual steps are summarized here and elaborated below to provide clarity with regard to these interventions. In total, three AR cycles were completed before assessment of strategic alignment was achieved. The main findings from the AR cycles are that:

- Disentangling PR from other development process aspects is needed in order to recognize PR explication as a separate activity (AR cycle 1).
- The subjective and fragmented nature of the PR generated impedes rational assessment of strategic alignment (AR cycle 2).
- Revising an instrument's causal map during the procurement instrument development process provides a rational way to create strategic alignment (AR cycle 3).

5.5.1 AR cycle 1: Disentangling PR

The first AR cycle was triggered by research observations in a two-hour meeting in which the PID presented his first ideas regarding the new QS to a small group of colleagues. Author1 attended this meeting and then organized five separate one-hour interviews.

Diagnosing – Conversations during the trial meeting barely touched on PR. Most of the meeting was spent clarifying issues that involved time-consuming discussions between the PID and the participants. In total, the researchers categorized nine such issues from the meeting and the interviews.

One category of issues concerned ambiguity in the assignment to create a vision. It was observed in the meeting and in subsequent interviews that the assignment lacked clarity. Questions were raised with regards to what exactly the development process should deliver (issue 1: what is a 'vision' anyway?), what triggered the assignment (issue 2: why a new vision?), what is the current state (issue 3: what exactly is our current vision, is it documented?), which problems should be solved (issue 4: on precisely which aspects is the current QS supposedly lacking?), how urgent is the assignment (issue 5: when to deliver, what are the consequences if delivery is late?).

Another category of issues related to ambiguity in the organization of the development process. This regarded current process design (issue 6: how is the process designed, what are the next steps, who is involved?), and alternative ideas for running such a process (issue 7: benchmark international QS designs?).

The final category of issues concerned practitioners' understanding of the current QS. Questions were raised about demarcation (issue 8: what exactly is part of the QS?) and performance measurement (issue 9: how is the current QS's performance assessed, how should it be assessed?).

Action planning – We initially hypothesized that a clear conceptual identification of PR and its role in the development process was needed. Describing process activities and the role of PR in some of these activities would help to move development process ambiguities to one side, and thus create time and attention for PR.

Action taking – Based on the issues identified above and generic schemes for design processes, Author1 developed a proposal for a generic procurement instrument development procedure. The goal of this procedure proposal was both to address the issues identified above and to create

time and attention for explication of PR. Figure 2 summarizes this procedure proposal and marks the activities where the PID needs to focus on explication of PR in particular. The proposal was discussed and approved in a workshop with the PID, members of the management team and the researchers.

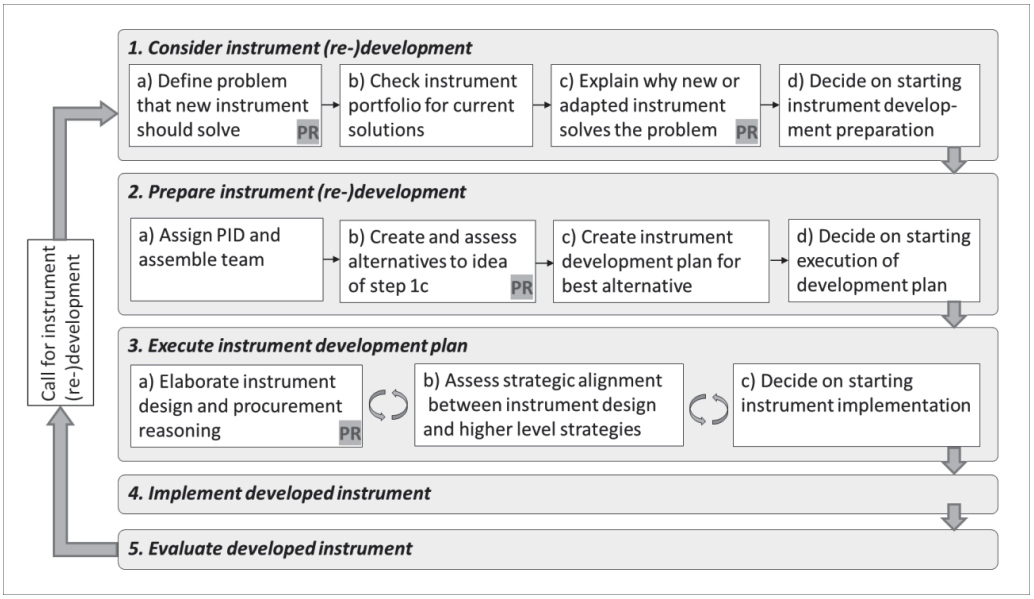

Figure 2: Summary of the proposed procedure for procurement instrument development

Evaluating – After the workshop, the PID and the first two authors evaluated the action. Overall it was concluded that the procedure proposal was an improvement on current practice because it distinguishes PR-related activities from activities relevant for organizing the procurement instrument development process. This enables the PID to focus on PR explication and save it from drowning in process ambiguities.

Specifying learning – The development process and PR can be intertwined in an ambiguous manner. Therefore, disentangling PR from other development process aspects is needed in order to recognize PR explication as a separate activity.

5.5.2 AR cycle 2: Explicating PR

The second cycle was started after a two-hour 'vision sharing session' organized by the PID. Having substantially elaborated on his original ideas, his aim was now to present these as 'the vision' for the new QS and find out whether the attendants would support this vision. The PID's PR was incorporated in his presentation. Three experienced category managers and author1 were invited to this session. Within the two weeks following this meeting, author1 interviewed each of these category managers. The separate one-hour interviews were intended to evaluate the meeting in general and particularly to explore each person's personal PR on the QS.

Diagnosing – The PID felt he was not receiving sufficient feedback in the form of PR. As in AR cycle 1, discussions on other issues were consuming the meeting time. Six additional issues were identified. These were categorized as either development process issues (issue 10: more time needed to process all the information before confirming one's support of the new vision; issue 11: changed motivation for creating a new vision; issue 12: lack of clarity about extent of personal involvement in the development process) or PR process issues (issue 13: reinvention of PR; issue 14: difficulties in articulating PR; issue 15: insufficient opportunity to develop PR).

Action planning – Author1 and the PID agreed to invite the category managers for a second two-hour meeting but, this time, they would be restricted to talking only about PR in the sense of the presumed effects of the new QS design in their respective procurement categories. To illustrate the desired PR, quotes from each of the earlier interviews would be presented as examples of PR. In this way, the category managers would be shown which parts of their own words should be understood as PR.

Action taking – In the second meeting, both the PID and the authors intervened several times to urge the category managers to explicate their PR. This resulted in pieces of PR for each procurement category, such as 'I expect the new QS will decrease our supply market'. Why? 'In my category, some types of contractors will doubt whether the relatively limited amount of expected future work outweighs the investment needed to become qualified.' In turn, this gave rise to a discussion on the desired number of competitors for that particular type of contract and the expected increase in quality delivered.

Evaluating – The PID and the first and second author evaluated the action taking. It was noted as a positive result, that this time each of the category managers had expressed their PR about the vision's presumed effects. Further, the PR was deepened through discussion. While it was clearly not always easy to explicate one's PR, the relevance of explication became clear in this meeting. However, the generated PR came across as rather incomplete and subjectively prioritized lines of argument. Relationships with higher level procurement strategies, and ultimately the public client's strategic goals (safety, reliability, punctuality and sustainability of the rail infrastructure) were unclear or missing.

Specifying learning – While it is certainly helpful that practitioners now acknowledge the role of PR in the development process, and that time has been devoted to explicate PR, the subjective and fragmented nature of the generated PR impedes rational assessment of alignment.

5.5.3 AR cycle 3: Creating strategic alignment

Author 1 initiated the third AR cycle after a meeting with the procurement department's management team. Having finalized his vision on the new QS, the PID's next step was to obtain management approval. To this end, the PID organized a two-hour session with management representatives, some category managers and some experts on the current QS. The first two authors also attended this meeting.

Diagnosing – The new vision's presumed impact was seen as referring to an overly complicated environment that would make it impossible to swiftly inform the management team. It was diagnosed that the PR generated so far needed more structuring and that the relationship between PR and goals needed to be more clearly established.

Action planning - It was hypothesized that causal mapping (Bryson *et al.,* 2004) would be a helpful tool to structure the PR and establish relationships with goals. Since both the PID and the researchers were inexperienced with causal mapping, it was decided to try it out with only the PID initially, using only the PR generated so far. Author1 was to make himself familiar with the causal mapping literature so that he could guide this process.

Action taking - Author1 organized a two-hour session with the PID to use causal mapping as a means to assess strategic alignment. In this session, the PR behind the new vision was linked to a mix of top-level organizational goals (e.g. safety), lower level category goals (e.g. competition), inter-organizational goals (as described in the client's concession granted by government) and to some supply market features.

Evaluating - For a complex system such as the QS, causal mapping was seen as a useful tool to structure PR and relate it to higher level goals and strategies. The causal map for the new QS provided a practical means to place PR in a logical hierarchy. Similar to the causal mapping of process descriptions, going back and forth between the hierarchy of reasoning resulted in adjusted relationships, and additions and reformulations of reasoning. As such, the process of creating this map also resulted in an assessment of alignment, because the hierarchically linked reasoning was validated on the logic of presumed cause-and-effect relationships while attempting to complete the causal map. This seemed an almost immediate side-effect of the causal mapping process, since incomplete parts of the map may point towards potential misalignments.

Specifying learning - Causal mapping provides a practical tool to support the creation of strategic alignment by structuring and improving the PR so far generated, linking PR with other reasoning and goals, and complementing the hierarchies of reasoning. The process of revising an instrument's causal map along with the development of a procurement instrument provides a rational way to create strategic alignment.

Since this reflection answers this study’s research question, no more AR cycles were required from the academic perspective. Table 1 summarizes how the AR cycles resulted in an answer to the research question.

Table 1: Summary of AR cycles

	Diagnosis	Action planning	Action taking	Evaluating	Specifying learning
AR cycle 1	Implicit process design impedes explication of PR	Clarify process design in general and role of PR in particular	Procedure proposed to clarify process design and PR	Procedure is helpful but insufficient to explicate PR	Development process and PR are ambiguously intertwined
AR cycle 2	Explication of PR should be conceptualized and organized	Dedicate meeting to just PR and illustrate concept of PR	PR explained and stimulated in practitioner meeting	The generated PR appears subjective, incomplete and difficult to link	Generating PR requires explication of PR to be conceptualized, organized and stimulated
AR cycle 3	Complicated instrument environment hinders clear explication and linking of PR	Use causal mapping method to complete and link PR with strategy dimensions	Causal mapping applied in practitioner meeting	Causal mapping helps to articulate, discuss, link and complete PR	Alignment can be rationally created by revising the causal map during the development process

5.6 Discussion

This study set out to explore how public clients can rationally and objectively create strategic alignment during the development of a new procurement instrument. Previous research posited that procurement instrument development was often an intuitive and subjective process (Ballesteros-Pérez *et al.,* 2015). This was also seen in the present research, with the development process both started and shaped in an implicit manner. The majority of the 15 issues identified in the case study concern ambiguities that can be removed by explicating decisions, assumptions and facts. In this sense, the case study is exemplary (Flyvbjerg, 2006) for how the development process can be intuitively and subjectively run.

Most striking in this respect is the intuitive dealing with the strategic alignment construct. It seemed that achieving alignment was initially only intuitively striven for. Although the need to create consistency with organizational goals, regulatory frameworks and supply market characteristics appeared self-evident to the practitioners, it was unclear how the they conceptualized alignment and how the development process would lead to alignment being created. This corresponds with the observation by Søgaard *et al.* (2019) that practitioners employ a more tacit understanding of strategic alignment than researchers do.

This intuitive and subjective way of running the development process creates space for many issues to arise, for discussions to become blurred and for participants to contribute in intuitive and fragmented ways. Most significantly, it also impeded the rational creation of strategic alignment. Creating strategic alignment is not simply a matter of putting it on the agenda, it

requires knowledge, skill and involvement to produce a demonstrably rationalized and objective form of strategic alignment.

One key problem is that it is necessary to explicate procurement reasoning (PR) before one can create strategic alignment, and this in itself is already difficult. Explication requires not only time to be dedicated to PR in meetings, it also requires the willingness and ability of practitioners to collectively articulate, share, discuss and combine their PRs. It seems that the more complex a procurement instrument and its context become, the more experts that are required to be involved to cover all aspects, and the more collective explication of PR is needed to achieve a complete and rationalized form of PR.

Another key problem is that the generated PR needs to be linked through reasoning, and ultimately with goals, to Patrucco *et al.*'s (2017) four environmental dimensions. In this case, this linking quickly proved complex as there were many relationships between the instrument and its context. Here, causal mapping (Bryson *et al.,* 2004) was found to be a helpful and practical tool to manage this complexity. It was also helpful in explicating PR and stimulating practitioners to address incomplete or illogical parts of their PR. On this basis, it appears that officials developing procurement instruments should either have the ability, or avail themselves of the capability, to effectively chair meetings dedicated to explicating and linking PR.

To avoid this explication and linking of PR drowning in process issues, it is necessary to apply a clear procedural design for the entire development process. The procedure proposed in the case study can be seen as an initial attempt to break away from what is presumed to be the current widespread intuitive and subject practice of instrument development. Given the extensive research on procedures for selecting procurement instruments (e.g. Love *et al.,* 2012), the development of new instruments deserves much more research attention in the future. This view is also supported by the business process literature, where the identification of 'initial state processes' is recognized as the first step towards higher process maturity (e.g. Röglinger *et al.,* 2012). The procedure adopted in the case study helped to move the client's development process from the initial, 'ad hoc' stage to the 'defined' stage, thus enabling opportunities for further process improvement.

5.7 Conclusions and suggestions for further research

Strategic alignment can be created rationally and objectively during the process of developing procurement instruments by explicating and linking the reasoning behind the design of procurement instruments with the reasoning behind higher level strategies. Here, it is crucial to organize this explication and the linking of reasoning as a central and recurring activity throughout the development process, since practitioners tend to implicitly assume alignment rather than explicitly assess and demonstrate it.

Given that literature on procurement instrument development by public clients is scarce and that this research concerns only a single case, future research could validate the assumptions made in this study that intuitive and subjective development processes are widespread in

current practice, and that these processes generally include no more than implicit assessment of strategic alignment. Future research is also needed to operationalize the performance concept so that the generally assumed performance improvement associated with the creation of strategic alignment can be demonstrated and measured in practice.

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Chapter 6

Moving beyond one-off procurement innovation; an ambidexterity perspective

Abstract[5]

Purpose *– The development of innovative procurement instruments can be costly and risky. To capitalize on successful innovative instruments, it is essential that these are reused. However, reuse can be problematic in project-based public client organizations. This paper applies the ambidexterity concept of integration mechanisms to examine how such reuse can be facilitated.*

Design/methodology/approach *– An initial framework is developed to conceptualize and contextualize the ambidexterity integration mechanism for the procurement function of a multi-project public client. Concluding that, in this situation, an organizational procedure is an appropriate interpretation of the integration mechanism, a design science project is carried out to develop and implement a procedure in a real-life setting.*

Findings *– Reconstructed reuse patterns confirm the need to have an actionable integration mechanism implemented. Integration, in the sense of drawing benefits from successful one-off innovative procurement instruments, may fail unnoticed if not organized and deliberately managed. The procedure developed in the design science project demonstrates how such integration can be achieved.*

Originality/value *– Although research on ambidexterity has grown exponentially in the past decade, it has yet to be applied in the field of public procurement. Furthermore, the application of design science research is novel in this field of literature. The paper illustrates how both can help solve a relevant organizational problem.*

Keywords: ambidexterity, design science, innovation, organizational design.

6.1 Introduction

Public clients not only use existing procurement instruments, they also develop new ones. New procurement instruments, that may include contracts, contract award criteria or performance measurement systems, are needed when an instrument's environment is subject to change. This change may be caused by many factors, including the introduction of new products, services and supply markets (Dobbs *et al.*, 2015), the inclusion of new socioeconomic goals in procurement strategies (Brammer & Walker, 2011; Glas *et al.*, 2017; Obwegeser & Müller, 2018) or reforms in public procurement legislation (Arrowsmith, 2012; European Commission, 2016). Instrument development is key to appropriately adapting to these changes.

Procurement instrument development can be both costly and risky. Not only does the development process itself consume scarce resources, the application of the newly developed

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instrument in a real-life sourcing situation may also prove to be unsuccessful. Therefore, it is crucial that successful new procurement instruments do not remain one-off trials, but are reused and further improved after their first application in a sourcing project.

Although reuse is beneficial, it is not self-evident that such reuse occurs. In particular, for public clients operating in a multi-project environment (Aritua *et al.*, 2009), reuse can be problematic. For such clients, reuse requires learning from projects, which is known to be notoriously difficult in project-based organizations (Bartsch *et al.*, 2013; Chronéer & Backlund, 2015; Hartmann & Dorée, 2015).

When it comes to procurement instruments, defective learning can lead to inefficiencies. Instead of further improving on an instrument's performance, the same mistakes can be made again by another sourcing team in another project. Instruments may even be 'reinvented', and this can go unnoticed. Clearly, to avoid such inefficiencies, project-based public clients need to find ways to effectively reuse successful innovative procurement instruments.

This paper examines the idea that effective reuse can be managed through the application of appropriate 'integration mechanisms'. This idea is based on general ambidexterity theory, which identifies integration mechanisms as means to stimulate knowledge flow between exploration and exploitation units or activities (Raisch *et al.*, 2009).

In general, ambidexterity has been defined as the ability of an organization to simultaneously pursue both explorative (discontinuous) and exploitative (incremental) innovation (Junni *et al.*, 2013). Since the use and development of procurement instruments by public clients can be considered as exploitation and exploration activities, ambidexterity may offer a valuable theoretical lens for investigating how to manage the effective reuse of innovative procurement instruments.

Assuming that it is indeed key to apply appropriate integration mechanisms, the main question is how this notion can be operationalized. This paper sets out to address this question by drawing from a design science project (Wieringa, 2014) in which an integration mechanism is developed and implemented in the empirical context of a public client's procurement department. In this project, the integration mechanism is interpreted in the form of an organizational procedure. The purpose of this procedure is to enable further exploitation of successful one-off procurement instrument innovations. The goal of the design science project was to find out what operational procedure design would be workable in such an empirical setting.

Organizational ambidexterity is not a common concept in the public procurement literature. Its applicability in examining public procurement issues may even be disputed. Therefore, this paper starts by explaining what organizational ambidexterity entails, why it is applicable in the present context and how, in this study, its main concepts of exploitation, exploration and integration mechanisms are transposed. This leads to the presentation of an initial conceptual framework that formed the basis for the conceptual approach in the design science project. The main body of the paper presents the procedure's content, and how it was developed and

implemented. The discussion section not only reflects on the project's results, but in addition proposes an extension to the initial conceptual framework.

6.2 Conceptualizing the integration mechanism

6.2.1 General ambidexterity theory

The role and functioning of the integration mechanism needs to be understood from the background of general organizational ambidexterity (OA) theory. Ambidexterity refers to an organization's capacity to do two things equally well (Birkinshaw & Gupta, 2013). Although organizations strive to manage a number of dualities, such as efficiency and flexibility or low cost and differentiation (Gulati & Puranam, 2009), most often OA refers to the duality of exploitation and exploration as introduced by March (1991).

March argues that exploitation involves "refinement, choice, production, efficiency, selection, implementation, execution", while exploration focuses on aspects such as "search, variation, risk taking, experimentation, play, flexibility, discovery, innovation" (1991, p.71). Exploitation may result in short-term profit through efficiencies. In contrast, exploration may result in long-term profits through innovations.

The main idea stemming from OA is that exploitation and exploration should be balanced. An overly heavy focus on either exploitation or exploration will lead one into a 'trap' (Junni *et al.*, 2013; O'Reilly III & Tushman, 2008). The exploitation of current competences at the expense of exploring new ideas causes organizational inertia, preventing the organization from properly adapting to changing environmental conditions (the 'success trap'). In contrast, too much focus on exploration causes innovations to be replaced by new ideas before they have had the opportunity to contribute to the firm's revenue stream (Levinthal & March, 1993). This is referred to as the 'failure trap' (Junni *et al.,* 2013). Organizations are ambidextrous if, by balancing exploitation and exploration, they are able to avoid both traps.

6.2.2 Ambidexterity's integration mechanisms

It has been argued that integration mechanisms are essential to achieve OA (Jansen *et al.*, 2009). The function of integration mechanisms is to stimulate knowledge flow between exploration and exploitation units or activities (Raisch *et al.*, 2009) or, as it has been explained elsewhere, "…to enhance exploitation of explorative knowledge and technologies through improved knowledge transfer and diffusion…" (Eriksson, 2013, p. 335).

Many types of integration mechanisms can be found in the literature. However, applying these is not straightforward. Jansen *et al.* (2009, p. 808) contend that '… ambidextrous organizations should *carefully* design and implement *specific types* of integration mechanisms *at different hierarchical levels*' (emphasis added).

Care is called for in order to create an appropriate integration mechanism. First, carefulness concerns the type of integration mechanism. Since the literature suggests various types of integration mechanism, it is important to carefully select one or more mechanisms that are appropriate for the implementation context. For instance, Markides (2013, p. 318) presents a list of thirty integration mechanisms. The suggestions cover organizational measures (e.g. 'apply a common general manager for the main and the new business'), cultural measures (e.g. 'develop a culture of openness') and performance measures (e.g. 'identify measurement and evaluation metrics that are specific to the unit'). Given this variety in suggestions, one type of mechanism may be more appropriate for the implementation context than another.

Second, carefulness relates to the notion that integration needs to occur on multiple hierarchical levels. Each level of the organizational hierarchy, from top management to individual employees, faces some version of the ambidexterity dilemma (Birkinshaw & Gupta, 2013). However, as yet, the literature is 'missing studies that explicitly consider two or more levels of analysis simultaneously' (Birkinshaw & Gupta, 2013, p. 294).

Finally, alongside the aspects mentioned above, there is another aspect of integration mechanisms that requires care. Along with designing and implementing an integration mechanism in a real-life situation, there is the question of how to allocate roles and responsibilities. In this respect, the following statement by Birkinshaw and Gupta (2013, p. 296) is interesting: "[ambidexterity] provides frameworks and tools for understanding *how* managers make choices among competing objectives, *who* within the organization is responsible for those choices, and *what* exactly those choices entail". However, when it comes to the integration mechanism, the literature does not seem to explain how ambidexterity theory helps in allocating roles and responsibilities.

Given all these aspects for which care is required, it is not surprising that recent discussions on integrating ambidextrous structures have been criticized for only outlining in general terms what elements are involved in integration, and for not including operational nuances on how and when to integrate (Chen & Kannan-Narasimhan, 2015). Examining integration mechanisms in the form of organizational procedures seems an appropriate way to address this criticism. A procedure is understood here as a set of predefined tasks attributed to particular organizational actors. Procedures will include operational nuances as they involve detailed aggregation, often involving multiple actors on several hierarchical levels, and include the allocation of roles and responsibilities. Moreover, together with other artefacts, procedures are held to provide the context in which routines develop (Cacciatori, 2012). This is relevant since ambidexterity has been referred to as "… the *routines and processes* by which ambidextrous organizations mobilize, coordinate, and integrate dispersed exploratory and exploitative efforts, and allocate, reallocate, combine, and recombine resources and assets across differentiated units" (Jansen *et al.*, 2009, p. 797) (emphasis added). This makes procedure development especially interesting. While procedures may reflect no more than a paper reality, routines reflect the organizational reality. Thus, as an artefact to develop ambidextrous routines, the careful design and implementation of an integration procedure can be a beneficial endeavour.

6.2.3 Contextualizing the ambidexterity concept

Some might argue that OA should not be applied to public procurement. This stance would probably be based on the argument that OA is relevant when explaining how *firms* deal with threats to company survival. It is because of this emphasis on firm survival that private sector researchers have warned against "applying the term so broadly that it moves away from the original phenomenon and loses its meaning" (O'Reilly III & Tushman, 2013, p. 331).

Others, however, suggest "that the study of ambidexterity *is* the study of firms, or indeed of organizations more generally" (Birkinshaw & Gupta, 2013, p. 290), and view it as "a useful way of framing the challenges organizations face in managing two competing objectives at the same time" (Birkinshaw & Gupta, 2013, p. 296). The present study adopts this latter view. While the survival of the public organization can indeed be explained by theories other than OA (Kuipers *et al.*, 2018), the management of competing objectives is surely also an issue for public clients. Furthermore, with regards to procurement instruments, it is clear that both exploitation (use) and exploration (development) require scarce resources and thus form competing objectives that need to be managed.

OA is not present in the overviews of theoretical approaches for public procurement research (Flynn & Davis, 2014; Patrucco *et al.*, 2017a). To date, it does not even seem to have been applied in this field. The situation is slightly different for the *private* sector purchasing literature. Since both public and private procurement research can learn from each other (Arlbjørn & Freytag, 2012), it would seem relevant to also take stock of OA use in that field of literature. In the private sector purchasing literature, OA has only recently been applied in research on the buying firm (Gualandris *et al.*, 2018). These authors propose the term 'purchasing ambidexterity' to refer to the extent to which a purchasing function simultaneously pursues exploratory and exploitative activities within its supply networks. As such, the kind of 'ambidextrous procurement' considered in the present study relates only remotely to Gualandris et al.'s (2018) interpretation.

The present study identifies the exploitation and exploration of procurement instruments in two phenomena of procurement practice. On the one hand, *exploitation* is recognized in the fact that frequently procuring public clients commonly maintain a portfolio of procurement instruments. This portfolio enables sourcing teams to use standardized instruments, such as contract templates, tendering procedures and contract award systems, in multiple procurement processes. Maintaining such a portfolio is claimed to create time and cost efficiencies, provide a range of contracting options and ease the use of, and compliancy with, legislation and policy (Australian Government, 2007). Repeated use also enables the client to evaluate and continuously improve its portfolio instruments. Maintaining a portfolio of procurement instruments thus typically concerns exploitation.

On the other hand, *exploration* can be observed in the practice of public clients adopting or self-developing innovative procurement instruments. The term 'innovative' is used here in the sense of the "…earliness or extent of use by a given organization of a given new idea, where 'new' means only new to the adopting agent, and not necessarily to the world in general" (Downs Jr &

Mohr, 1979, p. 385). Adoption may concern the introduction of a new type of contract (e.g. NEC4 (Rowlinson, 2018)) or procurement approach (e.g. the best value approach (Snippert *et al.*, 2015)) developed external to the public client's organization. In addition, public clients also self-develop innovative procurement instruments (e.g. CO2-performance ladder (Rietbergen & Blok, 2013)). Whether clients adopt procurement instruments developed elsewhere, or develop new instruments themselves, the application of innovative approaches typically involves exploration.

The present study assumes an ideal situation with regards to innovative procurement instruments. This ideal situation is based on the idea that organizations can learn through 'vanguard' projects (exploration), then refine this knowledge over time and exploit it in a systematic approach to project operations (exploitation) (Brady & Davies, 2004). As discussed above, general OA theory posits that integration mechanisms are a condition for achieving this ideal situation. If an innovative procurement instrument is successful in the vanguard project, but the knowledge is not transferred, then the organization runs the risk of falling into both the success trap and the failure trap. The innovative instrument may not be reused because the client sticks with current conventional instruments (success trap), or it may be replaced by new instruments before it has had the opportunity to contribute further to the public client's performance (i.e. the public equivalent of 'the firm's revenue stream').

To avoid success and failure traps, the client organization needs to deliberately consider future reuse of the instrument, and, if deemed worthwhile, facilitate such reuse. It is questionable whether this can be described in the form of a generically applicable procedure, since the procurement function's organizational design (Bals *et al.*, 2018) differs across organizations (Glock & Broens, 2013; Patrucco *et al.*, 2019; Thai, 2001). This extends to the allocation of roles and responsibilities to procurement staff. Nevertheless, as a rough outline, it is useful to classify several types of procurement staff as potential key actors in the integration mechanism. At least three types are relevant here: public buyers, category managers and line managers. It seems reasonable that all should have some role and form of responsibility in the integration mechanism.

The public buyer sensibly has a role in the integration mechanism with regards to knowledge transfer. In this paper, the public buyer is seen as a member of a cross-functional sourcing team (Driedonks *et al.*, 2014). Either as a user or as a developer, the public buyer is personally concerned with the operational aspects of the procurement instrument. In the case of instrument development, the public buyer is likely to become the most knowledgeable person on the new instrument. Such a knowledge position logically leads to a role in the integration mechanism with regards to knowledge transfer. Category managers are more likely to be involved in the integration mechanism on a more tactical level than public buyers, notably in assessing strategic alignment (Patrucco *et al.*, 2017b). This view is based on observations of practice since category management has not been addressed in the public procurement research literature (Patrucco *et al.*, 2017a). Finally, line managers, since they are responsible for the resource allocation by public buyers and category managers, will presumably need to make go/no-go decisions with respect to the integration mechanism.

6.2.4 Initial conceptual ambidexterity framework

Based on this literature review, ambidexterity is conceptualized and contextualized in this study as follows. Here, *exploitation* concerns the use and continuous improvement of the public client's portfolio of standardized procurement instruments. In contrast, the development and application of innovative procurement instruments is perceived as *exploration*. Finally, the *integration mechanism* links exploration with exploitation by evaluating whether future reuse of innovative procurement instruments is sensible and, if so, by facilitating their reuse. Figure 1 illustrates the resulting conceptual framework. The text in italics indicates how the three ambidexterity components are contextualized.

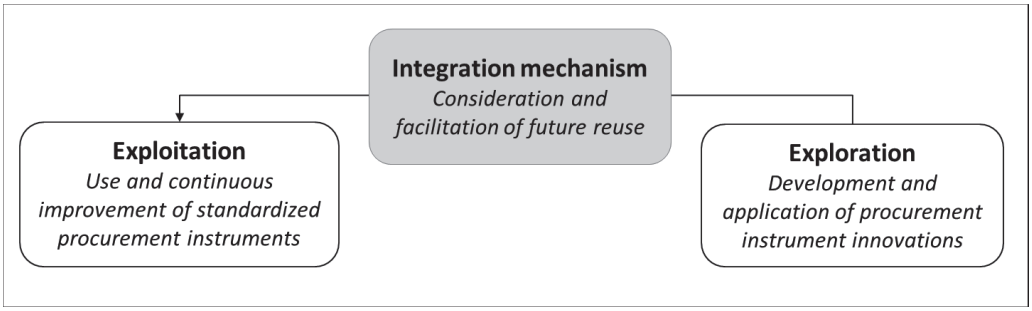

Figure 1: Conceptual ambidexterity framework

The value of this conceptual framework is that it visualizes the functioning of the integration mechanism, both in general and in the particular context of procurement instrument management. However, as the literature does not reveal aspects of the integration mechanism design, such as the allocation of roles and responsibilities across a hierarchy of organizational levels, the framework does not offer any guidance on its further operationalization.

6.3 Research approach

The purpose of this study is to investigate how the notion of an appropriate integration mechanism can be operationalized for the empirical context of a public client's procurement department. A design science project has been selected as an appropriate approach for answering this question. Although design science applications are rare in public procurement research, it is a common research strategy in engineering and medicine and is gaining ground in areas such as information systems and operations management (van Aken *et al.*, 2016). Design science research (DSR) iterates across two activities: designing an artefact that improves something for stakeholders; and empirically investigating the performance of an artefact in a specific context (Wieringa, 2014). In this study, the artefact is the procedure by which the integration mechanism is operationalized. The context concerns its use by procurement staff working at the procurement department of a public infrastructure management organization in the Netherlands.

The design problem was formulated as follows: 'What design of operational procedure achieves for this particular department the ambidextrous purpose of the integration mechanism with

regards to the reuse of innovative procurement instruments?' With respect to real-world problems, design science projects are always restricted to three tasks: problem investigation, treatment design and treatment validation. These tasks are referred to as the design cycle, because design science research projects usually go through several iterations of this cycle (Wieringa, 2014).

A design science project uses knowledge from a specific context. According to Wieringa (2014), this knowledge context consists of existing theories from science and engineering, specifications of currently known designs, useful facts about currently available products, lessons learnt from the experiences of researchers in earlier design science projects, and plain common sense. The design science project uses this knowledge and may add to it by producing new designs or by answering knowledge questions. With regards to the use of existing theories in the present study, the knowledge context mainly consists of theories linked to organizational learning (Chronéer & Backlund, 2015; Crossan *et al.*, 1999) and knowledge management (Ragab & Arisha, 2013).

6.3.1 Research design

Wieringa (2014) distinguishes the design cycle from the engineering cycle. Together, the three tasks of problem investigation, treatment design and treatment validation constitute one *design* cycle. The design cycle requires further iteration if the validation result is not satisfactory. Validation involves justifying that the artefact would contribute to stakeholder goals if implemented in the real world. The *engineering* cycle includes both the design cycle and the subsequent implementation of the artefact. The research design adopted in this study follows this logic.

The type of design science applied in this study is commonly referred to as technical action research (Wieringa, 2014). As such, the treatment validation is conducted while the artefact is still under development and not being used by stakeholders apart from within the research context. That is, the artefact is only used by researchers to test its properties under real-world conditions. For the present study, this means that the procedure, while still under development, was validated against the reuse pattern of a particular procurement instrument.

The researchers have also been involved in the implementation of the artefact. The researchers' role in this regard was limited to advisory tasks related to writing a proposal to include the procedure in the client's Quality Management System (QMS) and fitting the procedure in with existing QMS procedures. Achieving implementation is relevant since the ultimate goal of both the researchers and the client is that the procedure contributes to establishing an organizational routine. The sections below briefly describe the purpose and research activities of the design cycle.

6.3.2 Problem investigation: current state assessment

The purpose of the problem investigation task was to check whether the department lacked effective routines for integrating innovative procurement instruments. Since the presence of

routines may be easily recognized by following up procedures, the client's quality management system (QMS) was searched for relevant texts on the selection (exploitation), development (exploration) or standardization (integration) of procurement instruments. In addition, to cover the possibility of non-documented routines, this phase also involved interviewing procurement officers. In addition to asking about regular and predictable patterns of actions taken after the application of an innovative procurement instrument, this included also asking for relevant examples of frequently reoccurring procurement instruments that are not part of the portfolio.

The assessment of the current state was not intended to include all procurement instrument applications within a certain time span. This was because the client usually runs about 400 to 500 tender procedures each year. Given that the aim was to confirm the initial assumption of lacking routines, full coverage was unnecessary as well as requiring excessive research effort. Instead, collecting evidence of one or a few examples where integration was clearly lacking was assumed to be sufficient to convince practitioners, and to move on to the next task of developing a workable solution.

6.3.3 Treatment design: procedure development

The purpose of the treatment design task was to develop a procedure that describes who should take what actions to consider and facilitate future reuse of innovative procurement instruments. This procedure development started with a literature review on knowledge sharing issues in project-based organizations. The knowledge management literature was considered particularly relevant in structuring the procedure design, in part because of the range of KM strategies (codification, personalization and people finder strategies). Based on such concepts, a first draft of the intended procedure was developed.

6.3.4 Treatment validation: procedure try-out

The purpose of the treatment validation task was to test, in collaboration with practitioners, whether the procedure is effective. For this, an appropriate case is needed. One practitioner suggested examining the reuse pattern of a particular procurement instrument known as 'market consultation'. This market consultation can be described as a non-committal process of consulting suppliers, often with the intention to prepare a future tender procedure. In general, this process is sometimes also referred to as a 'request for information'. The reason to examine this particular instrument was based on the impression of several practitioners that the instrument seemed rather new, and that recently the number of applications had been growing extensively. Although concrete data were not to hand, practitioners were wondering why a template had not yet been created.

This case seemed appropriate for two reasons. First, because this market consultation amounts to a fairly uncomplicated instrument, trying out the procedure would probably not be impeded by issues related to understanding the instrument itself. This would help keep focus on the procedure rather than on the instrument and it would not require significant practitioner resources to complete the procedure. Second, this instrument would probably enable us to try out both parts of the procedure design. Upfront, it seemed highly likely that template

development would be the desired outcome. If that proved correct, future reuse would not only be considered, it would also be facilitated. The researchers therefore decided to reconstruct the reuse pattern of this particular case.

The intermediate and final results of trying out the procedure also formed the input for deciding whether more design cycle iterations were needed. The procedure design would be considered complete when the practitioner's committee entrusted with approving the QMS change proposals gave its consent.

6.3.5 Implementation: procedure incorporation

After the research design project, the researchers remained available to offer advice on incorporating the procedure design in the client's QMS. Activities in this phase involved adapting the procedure design in such a way that it would fit with existing QMS procedures and advising the procurement department's management team on the proposed procedure inclusion.

6.4 Operationalizing the integration mechanism

6.4.1 Problem investigation: current state assessment

The assessment of the client's QMS led to the conclusion that while exploitation was covered, there was a gap in the QMS related to both exploration and integration. *Exploitation* routines could be recognized in procedures describing how to maintain and improve the portfolio of standardized procurement instruments, and how to justify the selection of certain procurement instruments for a given sourcing project. In contrast, *exploration* and *integration* procedures were absent in the QMS. Procedures were not found for the development of completely new procurement instruments or for considering future reuse of innovative procurement innovations. This assessment was confirmed in an interview with the procurement officer who had created the existing set of procedures. According to this officer, at that time the main purpose of the current QMS procedures had been to structure the organizational processes involved in adapting already standardized instruments. Neither the development nor the integration of innovative instruments had been the focus.

However, the absence of procedures does not mean that exploration and integration did not occur at all. Several examples of new procurement instruments were found. However, instrument integration appeared to be rather random. Whereas some procurement instrument innovations were reused and improved over the course of several projects, other innovations seemed to run the risk of passing into organizational oblivion since, for unclear reasons, these had not been reused for a considerable period.

Overall, it was concluded that both exploration and integration were not managed at an appropriate, overarching, level. Exploration processes seemed primarily driven by the needs of a particular project, and thus seemed to be mostly managed on only the project level. As such,

the problem in this multi-project environment seemed to be that integration would remain somewhat hazardous unless it were to be structurally organized at higher levels than the current project level.

6.4.2 Treatment design: procedure development

Based on the results of the problem investigation and the literature, a procedure was developed that essentially leads to two key decisions: a) the decision whether to reuse, reconfigure or retire the instrument, and b) the selection of the most appropriate knowledge management strategy for reusing or reconfiguring the instrument. Figure 2 shows the key steps in the designed procedure.

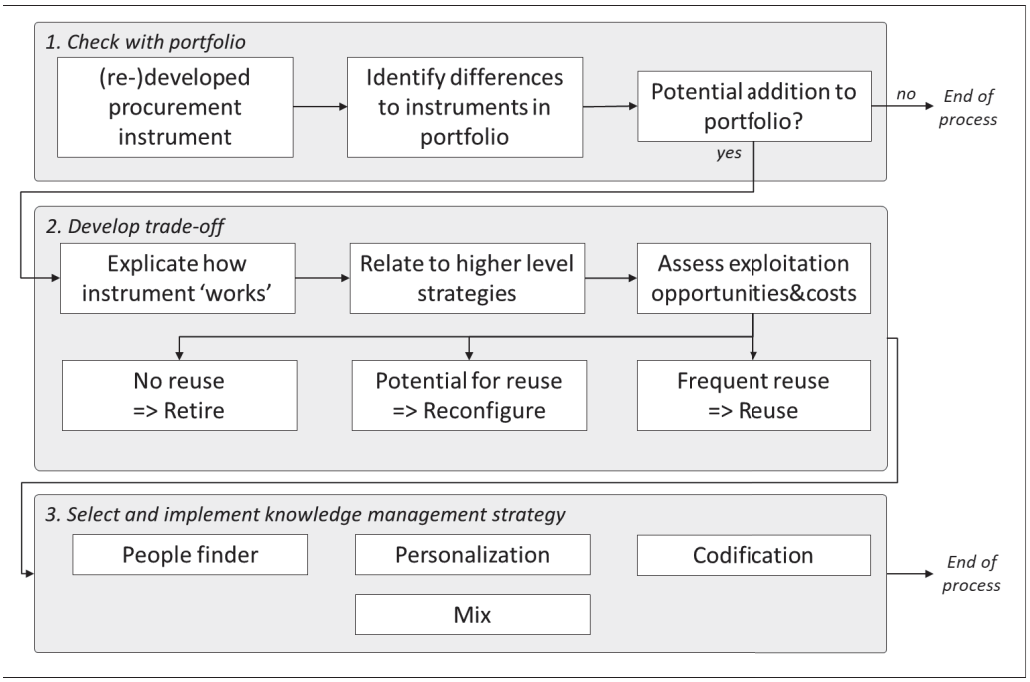

Figure 2: procedure design for the integration mechanism

The allocation of roles and responsibilities is not illustrated in the figure. Rather than determining this allocation in advance, it was decided to first find support for the proposed activities during a procedure try-out. After reaching agreement on the content and sequence of activities, the discussion on allocation of roles and responsibilities would be started.

6.4.3 Treatment validation: procedure try-out

To uncover the reuse pattern of market consultation documents, the client's project archives over the past ten years were examined for instances of market consultations. The incidence rate per year, the names of the involved practitioners and the sources for drafting the documentation were retrieved. Figure 3 illustrates the reconstructed reuse pattern.

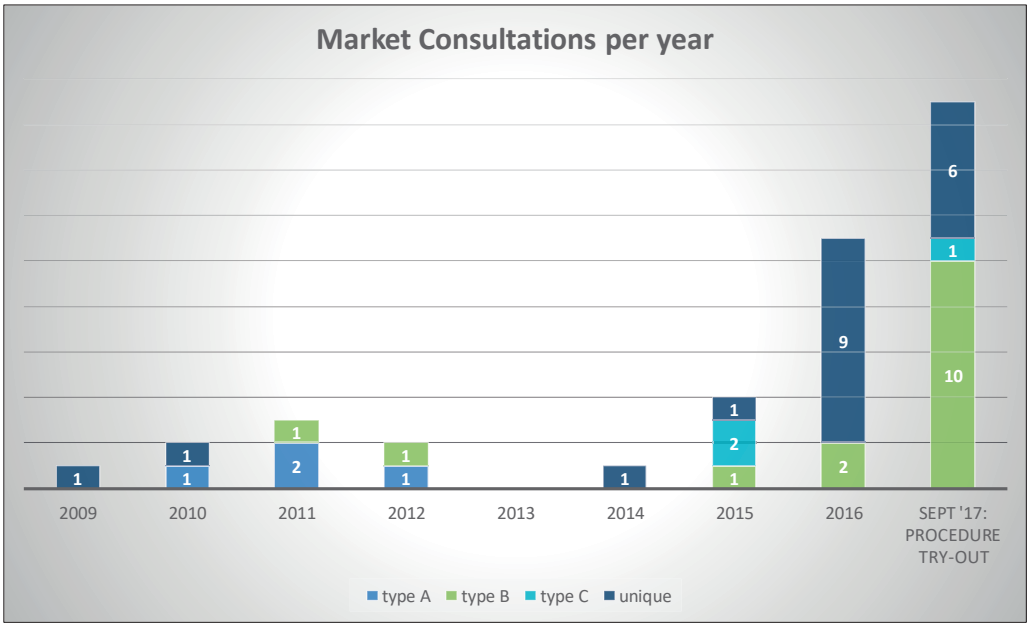

Figure 3: Reuse pattern of market consultation documentation

This reuse pattern confirms the practitioners' impressions that market consultations had been increasingly applied over time, with the most recent year having at least 15 applications. The analysis showed that this instrument had been being used for several years, albeit only incidentally. So, while the instrument initially seemed rather new, this was not the case.

Three distinct documents appeared to have served as source documents for later applications (classified as types A, B and C). Both the structure and content of each of these documents reappeared in recognizable form in later documents. Nevertheless, the majority of market consultation documents could not be traced back to one of these informal templates. These are therefore viewed as unique, one-off documents. Further, it appeared that only a few practitioners had carried out market consultations more than once. Finally, no clear explanation was found for the dominance of type B documents in the most recent two years. The pattern seems to show the emergence of a non-formalized practice that is not supported by an overarching strategy.

In conclusion, the pattern identified indicates that market consultation, as an ideal type of procurement instrument, has repeatedly been operationalized by various people, but usually without reusing and improving previously developed documentation. The identified pattern also indicates that one type of document has emerged as the dominant informal template without there being a deliberate assessment of its appropriateness to serve as such.

Procedure try-out

To try out the procedure, a two-hour meeting was organized with a group of five procurement officers (three tender managers, one category manager and the secretary of the committee responsible for the portfolio of standardized procurement instruments). This meeting started with presenting the reuse pattern as described above. The officers supported the view that the pattern could not be justified on the basis of differences in purchasing categories, market features or unique aspects of single cases. It was therefore concluded that the pattern points towards inefficiency caused by both hampered learning between projects and a lack of an overarching procurement instrument development strategy. In turn, these hindrances were thought to occur because of a failure to allocate responsibilities for these aspects.

After the reuse pattern was discussed, the meeting went on to consider the scale of the problem. Author 1 and the practitioners discussed to what extent the situation found concerning market consultations might be typical of other non-standardized but frequently used procurement instruments. The practitioners observed that, on the one hand, this particular instrument is rather straightforward and only concerns the pre-contractual phase whereas, in contrast, the client's portfolio contains a range of standardized procurement instruments for complex arrangements in the contractual phase. On the other hand, practitioners had the overall impression that an unknown but significant number of frequently used instruments had somehow, and for no obvious reason, not become portfolio items. The practitioners stated that this case's reuse pattern would probably be typical of a number of other cases. The costs incurred by such patterns were unknown, but were thought to be significant. The reuse pattern thus signalled a problem relevant enough for further investigation.

The meeting therefore continued with discussing the proposed procedure design. The practitioners agreed with the idea that developing and implementing a procedure would be a sensible approach for reducing inefficient spending of resources on instrument development and for improving cross-project learning ability. Further, the tasks described in the procedure were considered reasonable.

The meeting then moved on and tried out the procedure on the market consultation case. Given the reconstructed reuse pattern, the practitioners concluded that a standard set of documentation should be created to facilitate future reuse. In terms of the procedure, they selected the codification strategy. The associated set of documentation should consist of a template for the market consultation document and a manual. The manual should include an explanation of when using the instrument would be appropriate, how it is expected to function and how it can be strategically aligned with the public client's goals.

Finally, the meeting discussed allocating actors to develop the documentation. It was decided to involve eight practitioners, one to develop the documentation and the others to review draft versions.

In the weeks that followed, the documentation was developed. One main issue became apparent during this part of the procedure. Progress in establishing a standard for market

consultations was slow due to prioritization issues on the individual and organizational levels. On the individual level, competition for scarce resources became an issue almost immediately. Practitioners involved in writing or reviewing the documentation repeatedly had to balance urgent project sourcing matters with standardizing the market consultation documentation. Practitioners indicated that the latter was given lower priority. For the individual practitioners, delays in document development had far less obvious consequences than not attending to project matters in a timely manner.

Improved procedure design; allocation of roles and responsibilities
The trying out of the procedure led to several adjustments and additions to the initial procedure design. The most prominent addition concerned the allocation of roles and responsibilities. As discussed above, the key problem with developing the template and the manual was that the practitioners in question were constantly confronted with prioritization issues. The improvement made to the procedure was therefore to treat the execution of the selected knowledge management strategy as a project. Similar to sourcing projects, the advantage of this framing is that timelines, actors, resources and accountabilities are clearly set, and that conflicting resource demands can be raised with line management.

This project framing was elaborated in a general allocation of roles and responsibilities. It was decided that the procedure should start with an individual procurement officer developing an innovative procurement instrument for a particular sourcing project. Being the most, or perhaps the only one, knowledgeable on the new instrument, this officer must have the responsibility for performing the first step of the procedure (check with portfolio).

The line manager should have decision-making responsibility with regards to the next procedure steps (develop trade-off, and select and implement knowledge management strategy). The procurement officer responsible for the previous first step should also be strongly involved in these steps to share his knowledge on the procurement instrument in question.

6.4.4 Implementation: procedure incorporation

The goal of the design science project was to develop a procedure that could be incorporated in the client's QMS. Approval turned out not to be straightforward as new discussions arose about the allocation of responsibilities. This time, the involvement and accountability of representatives from departments other than the procurement department was raised as an issue. Eventually, this discussion did not affect the procedure's design because practitioners solved the issue by adjusting another QMS procedure.

The procedure for the integration mechanism was thus submitted for approval by the department's management team. Overall, the need to incorporate the procedure was recognized. Although the study had not elaborated the costs associated with adding an integration mechanism, and the returns of knowledge sharing can be difficult to estimate, the identified market consultation reuse pattern was seen as providing compelling evidence of inefficiency. Further, the management was convinced that allocating roles and responsibilities made sense, and therefore accepted the procedure's incorporation in the organization's QMS.

6.5 Discussion

This design science project set out to develop a workable operational procedure design that reflects the theoretical purpose of ambidexterity's integration mechanism. Key criteria for assessing design science research (DSR) are the pragmatic validity and practical relevance of its output (van Aken *et al.*, 2016). Further, the contribution to knowledge of a DSR project depends on its problem and solution maturity (Gregor & Hevner, 2013). These aspects are therefore discussed below. In addition, this section proposes an extension to the conceptual ambidexterity framework presented above. The purposes of this extension are to include ambidexterity's multilevel character, to provide guidance for the allocation of roles and responsibilities and to reframe this study's interpretation of the integration mechanism in terms of the well-established organizational learning framework proposed by Crossan *et al.* (1999; 2011).

6.5.1 Discussion of DSR aspects

The core product of DSR is a generic design supported by a design proposition (van Aken *et al.*, 2016). In the present study, the generic design concerns a procedure that was illustrated in Figure 3. The design proposition is that, by following this procedure, the exploration of new procurement instruments will be integrated with exploitation through the deliberate consideration and facilitation of instrument reuse. This integration is the result of a deliberate decision to reconfigure or reuse a new instrument, or else to retire that instrument. In the case of reuse, the procedure subsequently results in a standardized procurement instrument.

The justification of a generic design is based on pragmatic validity: that is, whether its implementation produces desired outcomes. However, the type of justification varies along with the level of impact that human agency may have (van Aken *et al.*, 2016). In the present study, human agency has a significant impact on the procedure outcome. By definition, a procedure merely prescribes the sequence of activities that should be performed and by which actors. Whether our procedure produces the desired outcome is therefore heavily influenced by the level of compliance by procurement officers. In turn, this compliance can be influenced by other potentially relevant integration aspects such as culture or incentives (Markides, 2013).

When, as in this study, the human agency impact is significant, pragmatic validity can be claimed through field testing a number of instances of the design within the intended application domain (van Aken *et al.*, 2016). Although the procedure has been tested by a team of researchers and practitioners, and the field testing was complemented by two focus group discussions (of procurement officers and of the department's management team), this study fails to show pragmatic validity on the basis of a number of case studies. In the present study, the testing included only one type of procurement instrument in one procurement department. Unfortunately, more testing was not possible given the scope and time limitations of the present research project.

The second key criterion in assessing DSR is its practical relevance. In the present study, the practical relevance of the generic design is illustrated by the reuse pattern of the market consultation documentation. It appeared that creating the reuse pattern was thought to take

more time and effort than practitioners allowed themselves to spend on non-project issues. Although some practitioners did have a feeling that there were inefficiencies in this respect, no one had taken the time to collect the data. Reusing innovative procurement instruments thus involved an organizational blind spot. However, once exposed, the reuse pattern quickly convinced the involved practitioners of the associated inefficiencies. The main practical relevance of the procedure is therefore that it legitimizes the spending of scare resources on avoiding blind spot inefficiencies.

Considering these two key criteria, the study's contribution to knowledge mainly concerns the identification of the problem context. A DSR project can potentially make different types and levels of research contributions depending on its starting point in terms of *problem maturity* and *solution maturity* (Gregor & Hevner, 2013). Our focus on the public client's procurement instrument processes and their framing in terms of ambidexterity theory (i.e. exploration, integration and exploration) is novel in the field of public procurement. Furthermore, previous research does not appear to have addressed the problems involved from any other theoretical perspective (Patrucco *et al.*, 2017a). Thus, overall, the maturity of the problems in the present study is fairly low. Given that the study's solution maturity is also low, but in part adopts known solutions from other fields for the present problem (i.e. codification, personalization and people finder strategies (Ragab & Arisha, 2013)), the type of knowledge contribution delivered by this paper can be primarily classified as 'exaptation' (Gregor & Hevner, 2013), referring to the extension of known solutions to new problems.

6.5.2 Extended ambidexterity framework

Above, it has been argued that ambidexterity theory provides an appropriate and useful theoretical perspective when considering the use and development of procurement instruments. However, the derived conceptual framework shown in Figure 1 offers only limited guidance on *operationalizing* the integration mechanism. Based on hindsight gleaned from the design science project, we now propose an extension to the initial conceptual framework. This extension addresses the lack of guidance with respect to two issues that needed to be addressed in the procedure: 1) the allocation of roles and responsibilities, and 2) ambidexterity's multilevel character. An additional benefit is that this extension also enables reframing the conceptual framework in terms of a well-established theory.

The first issue identified concerns the allocation of roles and responsibilities. It has been argued that ambidexterity frameworks and tools help to allocate responsibility (Birkinshaw & Gupta, 2013, p. 296). However, the experience of this case study to an extent contradicts this claim. Since we were unable to find any concrete frameworks or tools in the literature for allocating responsibilities, in the DSR project the rationale in allocating responsibilities was based on knowledge profiles rather than ambidexterity theory.

The second issue concerned ambidexterity's multilevel character. According to the literature, ambidexterity is a 'nested' concept in the sense that every organizational unit faces some version of the ambidexterity dilemma in deciding on the relative balance between exploitation and

exploration. As such, ambidexterity simultaneously appears on multiple levels of the organization (Birkinshaw & Gupta, 2013). However, which levels and how ambidexterity emerges remained obscure.

This 'multiple-level issue' has been addressed by allocating roles and responsibilities across multiple organizational levels. The identification of these levels (i.e. individual – group – organization) was not based on ambidexterity theory but inspired by the organizational learning framework of Crossan *et al.* (1999). This framework not only distinguishes multiple organizational levels in a useful and generally accepted manner, it also offers the opportunity to reframe the functioning of ambidexterity's integration mechanism in terms of feeding forward.

In essence, the study's procedure design concerns *a structured form* of feed forward. In Organizational Learning theory, feed forward refers to the potentially spontaneous transfer of learning from the individual to the group level and the organization level. The present study's procedure is designed to structure and legitimize that process. The individual level here concerns the procurement officer who is most knowledgeable on the new instrument. This person is given responsibility for starting the procedure and supporting other actors on the group and organization levels when necessary.

Organizational Learning (OL) theory posits that feed forward takes shape in four social and psychological processes, namely intuiting, interpreting, integrating and institutionalizing. These processes link the assimilation of new learning (exploration) and the use of what has been learnt (exploitation) at the individual, group and organizational levels (Crossan *et al.*, 1999).

Feed forward conceptualizes what the procedure aims to organize. This can be illustrated by the process of institutionalizing. Crossan *et al.* (1999) hold that organizational learning is distinct from the simple sum of the learning of its members. Although individuals may join or leave an organization, what they have learnt does not necessarily leave with them. Some learning is institutionalized, i.e. embedded in the systems, structures, strategy, routines and prescribed practices of the organization and in investments in information systems and infrastructure. Viewed from this OL perspective, the template document and manual for the market consultation instrument developed in this study concern a form of institutionalization. Since these documents are now included in the client's portfolio of standardized procurement instruments, the knowledge gained on individual level has become institutionalized and is available for exploitation at organization level.

The ideas elaborated above form useful extensions to this study's initial conceptual framework. Figure 4 illustrates how these come together in the extended conceptual framework. It identifies end-users (public buyers, cost engineers, legal advisors) and decision-makers (category managers, line managers, chief procurement officers) as two distinct categories of procurement officers with different knowledge profiles. The end-users either require in-depth knowledge of the procurement instrument, or develop such knowledge in a vanguard project. The decision makers presumably only require superficial knowledge of the instrument, enough to properly

evaluate strategic alignment and decide on resource allocation. The integration mechanism facilitates that the processes underlying to feed forward take place in a structured manner.

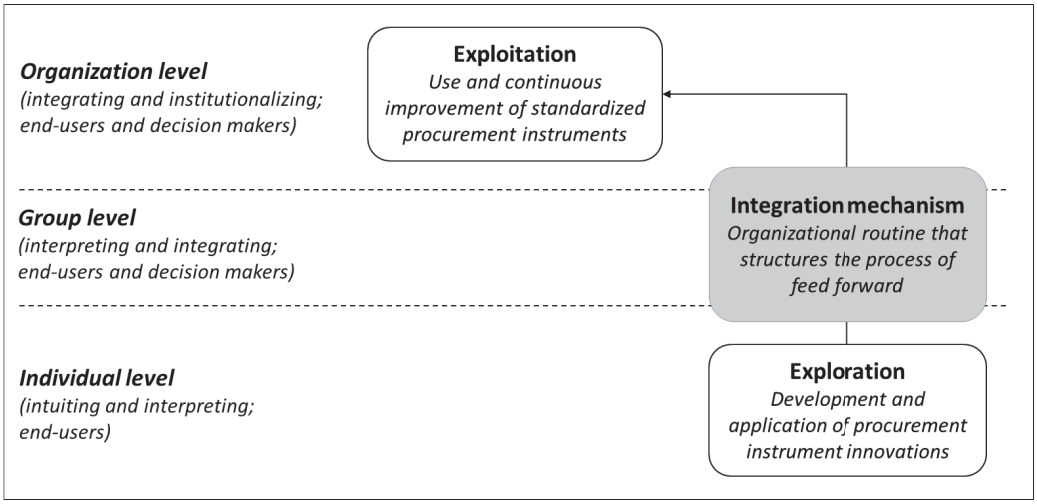

Figure 4: Extended conceptual ambidexterity framework

This framework is applicable for developing integration mechanisms in the form of routines or procedures in the context of multi-project public clients. Within this particular context, we would argue that this extended conceptual ambidexterity framework offers additional theoretical guidance for designing or examining integration mechanisms.

6.6 Conclusions

Applying appropriate procurement instruments in an ever-changing environment is vital for achieving satisfactory performance in the delivery of works, services and supplies. It is therefore important that the potential future reuse of successful innovative procurement instruments is secured. This is especially true for project-based organizations, where many barriers can hamper learning between projects.

This study identifies the consideration of instrument reuse, and the subsequent actions to facilitate reuse, as a specific task for various roles within the procurement function. According to ambidexterity theory, it is imperative to link exploration with exploitation through carefully designed and implemented integration mechanisms. This study supports this view by showing the necessity of having such a mechanism in place and demonstrates how it can be operationalized in the everyday practices of a project-based public client organization.

This paper contributes to the procurement literature by focussing on the use and development of procurement instruments. These are aspects of organizational design (Patrucco *et al.*, 2019) that as yet have not been investigated. In addition, this paper illustrates how both design science, as a method, and ambidexterity, as a theory, can usefully add to the methods and

theories that are currently employed in the public (Flynn & Davis, 2014; Patrucco *et al.*, 2017a) and the private (Spina *et al.*, 2016) procurement literature.

For practitioners, the present study sheds light on a potential organizational blind spot. This concerns the inefficient spending of resources on the development of innovative procurement instruments in separate projects. Unless practitioners are facilitated or stimulated to deliberately consider and facilitate reuse in future projects, it is likely that successful developments in one sourcing project will not benefit another. Awareness of this blind spot, the problems it creates and the potential benefits of implementing an effective integration mechanism will help the procurement function to increase the impact of successful innovative procurement instruments.

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Chapter 7

Synthesis of results

7.1 Introduction

This chapter combines the results of the five separate studies presented in the previous chapters. This is useful since it helps to gain a complete overview of the study results (this chapter) and discuss these on an aggregated level (next chapter). The overview presented in this chapter concerns a matrix that is built on two dimensions. The first dimension is given by the thesis outline already described in chapter 1. This concerns the IST-SOLL-HOW TO structure. The second dimension consists of the three main theoretical concepts of this thesis. These are also briefly described in chapter 1 and concern strategic alignment, ambidexterity and tacit knowledge. The resulting matrix offers a structure in which the results of the separate studies can be presented systematically.

Combination of study results is important for two reasons in particular. First, with regards to the problem situation (IST), there is more material to consider than the initial evidence provided in chapter 2 only. While the case study of chapter 2 delivers evidence for the argument that procurement instrument development is currently lacking higher purpose, or at least the ability to rationally demonstrate higher purpose, this regards only one set of instruments (instruments for project alliancing), and only one instrument management process (development process). The case studies in the other chapters also demonstrate a lack of demonstrating higher purpose. Therefore, consideration of this additional evidence is required to deepen the understanding of relevant factors and to strengthen the argument.

Second, although all three main theoretical concepts are important to this study, the focus on each varies per chapter. As a result, several conceptual models are presented, each of which contextualize theoretical concepts to the specific context of procurement instrument management. For instance, although the ambidexterity concept is elaborated in chapter 6 only, it helps to position the strategic alignment concept in the specific context of decision making on a newly developed procurement instrument. Therefore, clarifying the connections between the main theoretical concepts and summarizing how these have been translated to the specific context of procurement instrument management helps to provide overview from the theoretical perspective.

The synthesis of this chapter is thus presented in the form of a matrix that highlights study results on three theoretical concepts with regard to IST, SOLL and HOW TO. Figure 1 shows this matrix.

Syntheses		Main findings		
		Problem situation (IST) Organic evolution of procurement instruments	**Desired situation (SOLL)** Purposeful management of procurement	**Improving current situation (HOW TO)** Procedure development
Main theoretical concepts	**Tacit knowledge** to assess the problem situation, conceptualized by the implicit - explicit continuum and applied to the reasoning of procurement officials with regards to: a) instrument design, b) process design.	**Instrument design based on implicit reasoning.** This is evidenced for: - project alliancing (chapter 2), - qualification system (chapters 3 and 5), - precommercial procurement (chapter 4) - market consultation (chapter 6) and during: - selection process (IST 1; chapters 2 and 3) - development process (IST 2; chapters 2 - 4) - reuse consideration process (IST 3; chapter 5) **Process design based on implicit reasoning.** This is evidenced for: - development process (IST 4; chapters 2 - 6), - reuse consideration process (IST 5; chapter 5).	**Explicit reasoning on instrument design** through articulating, discussing and completing the argumentations and generalizations (SOLL 1; chapters 3 - 6). **Explicit reasoning on process design** (SOLL 2) through the use of procedures for the development and reuse of new procurement instruments (chapters 5 and 6)	Procedure developed to achieve **strategic alignment in the development process** through explicating reasoning and trade-off decisions on procurement instrument level, and linking that to reasoning and trade-offs on higher levels and dimensions of strategy (HOW TO 1; chapter 5). Procedure developed for the **reuse consideration process**, in which the degree of **strategic alignment** is assessed and taken into account in the decision making (HOW TO 2; chapter 6).
	Strategic alignment to shape the notion of purposeful management of procurement instruments	**No explicit link made** between the supposed effects of procurement instruments and the client's strategic goals (IST 6; chapters 2 - 6).	**Deliberate assessment of strategic alignment** between procurement instruments and the client's strategic goals when running procurement instrument management processes (SOLL 3; chapters 4 - 6).	
	Ambidexterity to approach the use (exploitation) and development (exploration) of procurement instruments.	**No integration mechanism in place** for linking procurement instrument exploration with exploitation (IST 7; chapter 6).	**Implemented integration mechanism** to ensure that reuse of newly developed instruments is considered and facilitated deliberately (SOLL 4; chapter 6).	

Figure 1: Overview of research results

7.2 Problem situation (IST)

The first category of results is centered on the reconstructed patterns of procurement instrument evolution. In summary, these patterns confirm the initial suspicion of a problematic as-is situation, since they picture a way of handling new procurement instruments that lacks higher purpose and direction. Two aspects have been focused on in this research: a) instrument design and b) process design. The problem with regard to procurement instrument design is that the reasoning and trade-offs behind instrument design (further: procurement reasoning) largely remain unarticulated. In all of the case studies, the procurement reasoning seldom is well-explained in the client's documentation and seems to remain in the minds of the involved individuals only. This implicit reasoning forms an impediment to assessing an instrument's strategic alignment, because it remains unclear how an instrument was expected to contribute to strategic goals.

The second aspect concerns process design. The main problem identified in the studies is that the reasoning behind main instrument management *processes* often are not articulated. Similar to the procurement reasoning, choices for how to run these processes are of an implicit and ad-hoc nature as well. This also forms an impediment to assessing an instrument's strategic alignment, because it aggravates implicit procurement reasoning.

Both the implicit procurement reasoning and the implicitly run instrument management processes are problematic. In a high-outsourcing organization such as ProRail, with tens of procurement officers handling multiple procurement instruments every day, implicit running of both processes leads to an overall whimsical procurement practice. Procurement instrument development can thus both be inefficient and ineffective in terms of contributing to the client's strategic goals.

Figure 2 illustrates the findings on implicit reasoning at an aggregated level. The shaded blocks mark that evidence for implicit reasoning on *procurement instrument design* is found in the selection process, the development process and the reuse consideration process. The red italic texts mark that implicit reasoning on *process design* is encountered in the development process and the reuse consideration process.

To underpin this summary of results, the next sections discuss the concrete evidence of implicit reasoning and implicitly run processes that the studies have delivered. These are numbered as IST 1 – 5 and grouped in instrument design and process design.

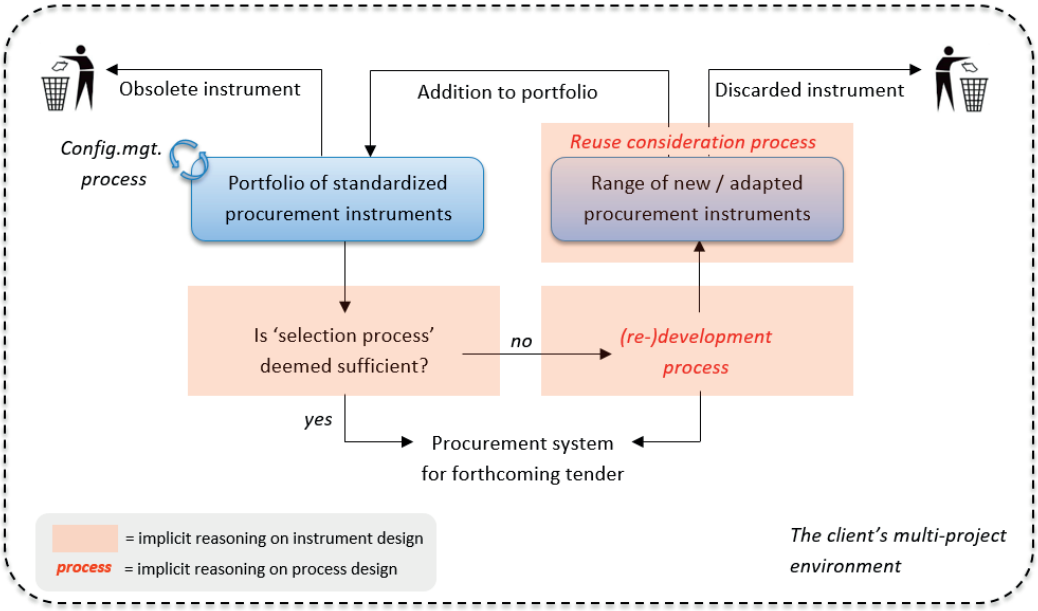

Figure 2: Illustration of implicit reasoning on instrument and process design

7.2.1 IST 1 – 3: Instrument design based on implicit reasoning

The construct of 'implicit reasoning' is elaborated in chapter 3. It refers to the idea that procurement officials expect certain effects when applying a specific procurement instrument, but do not articulate these expectations. Examples of such implicit procurement reasoning are found during the selection process (IST 1), the development process (IST 2) and the reuse consideration process (IST 3). The fourth main process, i.e. portfolio configuration management, was not examined on this aspect.

IST 1: implicit instrument selection

The case study of chapter 2 provides the first example of implicit reasoning. This regards the selection process. Chapter 2 demonstrates how documents retrieved from the project archives sparsely contain the motives for applying the concept in a specific sourcing project. In a similar way, Chapter 3 reconstructs the reasoning behind a specific procurement instrument known as 'qualification system'. With regards to the reasoning for applying the qualification system, the study findings expose that the formal communication is incongruent with the reasoning of the procurement officials currently employing the system. Although the officials do not consider the formally communicated motives to be wrong, they are held less important than the current motives. Since it required the researcher to organize that the officials think through, articulate, share and discuss their current motives, their reasoning qualifies as implicit.

IST 2: implicit instrument development

Chapters 2 – 6 show examples of implicit reasoning with regards to the procurement instrument development process. Chapter 2 demonstrates how key project alliancing design choices vary across applications in multiple sourcing projects. However, documented motives for deviating from previous design choices are sparsely retrieved. In particular, the study hints at two opposing logics to explain differences in the scope of the alliance domain. These opposing logics form detailed examples of the reasoning that probably led to alliancing design deviations, but remained implicit and therefore is difficult to retrieve afterwards.

Chapter 3 shows another example of implicit reasoning. It demonstrates how the instrument called 'qualification system' has evolved over the course of almost two decades. Over these years, its scope has been expanded and reduced. However, documented motives that explain these changes could not be retrieved.

Chapter 4 also presents examples of implicit reasoning. In this case study, the reasoning behind the instruments for precommercial procurement is reconstructed. It shows that design choices are made throughout the development process. Although more documented reasoning is found in this case than in the other case studies, the reasoning is incomplete and requires significant research effort to retrieve.

Chapter 5 examines causes to implicit reasoning. It identifies that explication of the reasoning behind procurement instruments in itself is difficult to achieve. Explication requires not only time to be dedicated to such reasoning in meetings, it also requires the willingness and ability of practitioners to collectively articulate, share, discuss and combine their PR. This chapter also identifies a number of issues that make explication even harder, because due consideration of these issues prevents officials to express and share their reasoning.

Finally, the study results of chapter 6 fit with this general pattern of implicit reasoning. No documented reasoning on design choices behind any variant of the market consultation instrument was found.

IST 3: implicit instrument reuse

The reuse pattern presented in chapter 6 indicates that reuse of new procurement instruments is considered on an ad hoc basis. In some cases, officials build on previously used instruments. In other cases, officials appear to develop a new instrument without any reference to previously used similar instruments. The legitimacy of spending resources on these one-off procurement innovations is questionable, since it is unclear in which respects these new instruments differ from similar previously used instruments, and whether the differences concern improvements. Also, with regard to those cases in which instruments are reused, the reasoning for reuse is not documented. Reasoning on instrument design during the reuse consideration process therefore qualifies as implicit reasoning.

7.2.2 IST 4 and 5: Process design based on implicit reasoning

The study results also prove that two instrument processes are designed implicitly. This becomes most apparent in chapters 5 and 6, which state that the client's current quality management system contains no procedures for developing (IST 4) or reusing of a new procurement instrument (IST 5). To be clear, this stands in contrast with the other two processes, the selection process and the portfolio configuration management process. Procedures for both of these processes are part of the quality management system.

IST 4: implicit development process

The design of the development process largely remains implicit in the client's current practice. This becomes most apparent in the study aimed at creating strategic alignment during the development process. Fifteen issues are identified in this study that illustrate how choices on development process design are made implicitly. Root causes to these issues are ambiguities in both the formulation of the assignment to embark on the development process, and in the subsequent design choices for that development process. As a consequence, many time-consuming discussions arise between the development process participants to clarify these ambiguities. These discussions not only hamper development progress but also impede articulation of why the proposed instrument design is appropriate.

IST 5: implicit reuse process

The case studies indicate that reuse of procurement instruments occurs. Some of the project alliancing instruments were reused (chapter 2). Similarly, some of the market consultation instruments were reused (chapter 6). However, these cases concern the reuse of *non-standardized* instruments instead of *portfolio* instruments. Instruments developed for a certain sourcing project are reused in another, without successful attempts to standardize the instrument and add it to the portfolio. Perhaps, these attempts are not even made. In such cases, project archives function as 'informal portfolios' at individual or group level. It is needless to say that these informal reuse processes are run implicitly.

7.2.3 IST 6: No explicit link with strategic goals

Given the high degree of implicit reasoning on instrument and process design, it is not surprising that explicit links with strategic goals have not been found in any of the case studies. Only after the researchers' interventions in the ongoing development process for the new qualification system, first attempts were made to link instrument design with the client's strategic goals (Chapter 5). Similarly, only after the researcher proposed to include in the manual an explanation of alignment between the market consultation instrument and the client's strategic goals, attempts were made to explicate this link (Chapter 6).

7.2.4 IST 7: No integration mechanism in place

The final aspect of the problem situation is that there is no integration mechanism in place, or at least not in the sense of structurally organized processes that link instrument development with portfolio configuration management. Chapter 6 signals that there are no arrangements present in the procurement department's quality management system that address the addition

of newly developed instruments to the portfolio of standardized procurement instruments. Also, none of the case studies exhibit any portfolio addition. Finally, procurement officials were interviewed to investigate the possibility of non-documented routines. These interviews did not point at integration mechanisms either, since questions about regular and predictable patterns of actions taken after the application of an innovative procurement instrument did not point at any form of integration routine.

7.2.5 Summary of problem situation

To summarize, the results confirm and substantiate the initial suspicion of a problematic as-is situation. Wild development patterns show that instrument development is lacking a higher purpose. Procurement officials develop, further develop or even unconsciously re-develop procurement instruments to accommodate the single sourcing project. The potential instrument contribution to overarching goals that may be formulated in category strategies, procurement department strategy, or organizational strategy, is not expressly taken into account. What's more, even at project level the link between instrument design and project features is unclear. The study results indicate that this is caused by implicit reasoning on both procurement instrument design and process design. The study results also point at a lack of mechanisms that facilitate reuse of newly developed instruments in future sourcing projects.

7.3 Envisaging the desired situation (SOLL)

Four aspects are identified with regards to how this thesis envisages the desired situation. These are numbered SOLL 1 – 4: 1) explicit reasoning on instrument design, 2) explicit reasoning on process design, 3) deliberate assessment of strategic alignment, and 4) an implemented integration mechanism. These are elaborated as follows.

7.3.1 SOLL 1: Explicit reasoning on instrument design

Chapter 2 theorizes that the reasoning behind procurement instruments consists of argumentations and generalizations. Ideally, this reasoning is explicated, that is, articulated, shared, discussed, improved and written out in text. The importance of explication is that it enables purposeful assessment of the instrument's potential contribution to higher level goals.

Examples of explicated reasoning are given by the reconstructions of reasoning in several case studies. One example concerns the reasoning behind the use of the client's qualification system (chapter 2, table 2). Procurement officials hold that 'The QS ensures that only firms that have mastered the required capabilities get to work on the core of the Dutch rail system'. This is a generalization, based on the observation in practice that 'Instances where things went wrong prove that firms require knowledge of the uniqueness of the Dutch rail system'. Consequently, the argumentation for applying this instrument is that it 'Contribute[s] to a safe and reliable rail infrastructure'. In the desired situation, reasoning such as this is articulated, so that it can be shared, discussed and improved. Subsequently, the improved reasoning is documented in order to enable future evaluation and further improvement.

7.3.2 SOLL 2: Explicit reasoning on process design

In the desired situation, process design features are also motivated by explicit reasoning. The studies described in chapters 5 and 6 have not only resulted in practically workable procedures (process design), but also in explicated reasoning on that design. The best examples of such explicated reasoning are given in chapter 6. One example concerns the choice to frame the second part of the reuse consideration process as a project. The reasoning for doing so is that 'timelines, actors, resources and accountabilities are clearly set, and that conflicting resource demands can be raised with line management' (chapter 6, page [12]). Another example of explicit reasoning on process design concerns the allocation of roles and responsibilities in the reuse consideration process. It is motivated why the procurement officer developing an innovative procurement instrument for a particular sourcing project must have the responsibility for performing the first step of the procedure (check with portfolio). This is because he or she probably is the most knowledgeable on the new instrument. Similar to the logic on instrument design, explication of the reasoning behind process design is an important feature of the desired situation, since it enables future evaluation and further improvement.

7.3.3 SOLL 3: Deliberate assessment of strategic alignment

In the desired situation, the potential contribution of procurement instruments to strategic goals is deliberately assessed. The general concept of strategic alignment forms the basis to this idea. Therefore, this general concept is contextualized in chapter 3. Strategic alignment is described there as the extent to which multiple-level reasoning and decision-making add up to logical means-and-ends relationships. Ideally, procurement instruments are not just tailored to the characteristics of the single sourcing project, but are viewed as the operational means to achieve ends as detailed in, for instance, a category strategy, department strategy, and eventually the client's strategic goals. Purposeful management of procurement instruments thus involves deliberate assessment of an instrument's potential to align with strategic goals. This assessment is requisite input to decision making in all of the four main organizational instrument management processes.

7.3.4 SOLL 4: Implemented integration mechanism

The reuse in future sourcing projects of newly developed procurement instruments is carefully considered in the desired situation. This ideal is derived from chapter 2, which identifies the reuse consideration process. The need for running this process is theoretically substantiated by the Ambidexterity argument that an implemented integration mechanism is required to balance exploitation with exploration (chapter 6). According to the general description of integration mechanisms, its function is to enhance exploitation of explorative knowledge through improved knowledge transfer and diffusion.

7.3.5 Summary of desired situation

To summarize, the desired situation is thus conceptualized as a situation in which a) both the development process and the reuse consideration process are deliberately organized, so that b) the reasoning behind procurement instruments is explicated, which is necessary to enable that c) the strategic alignment between the instrument and strategic goals can be assessed. To clarify

this idea of the desired situation, the chapters present concrete examples of explicit reasoning, both on the reasoning behind procurement instruments and on process design.

7.4 Procedures to achieve the desired situation (HOW TO)

Practice is obstinate. Theorizing and conceptualizing on the desired situation is important, but insufficient to achieve improvement in practice. The conceptualizations of this research have been operationalized to provide actionable knowledge. The most prominent results in this respect are presented in chapters 5 and 6. Procedures are the practical results of these studies. These have been developed in collaboration with practitioners and applied in practice. They are brought to the fore in this section to emphasize that the study results encompass actionable knowledge as well as theoretical contributions.

7.4.1 HOW TO 1: Procedure for the development process

The concrete result of this study is a procedure proposal for the development process. This procedure illustrates the main message of chapter 5. Deliberate creation of strategic alignment during the development process requires explication of the reasoning behind procurement instrument design. This explication involves several actions, including articulating, sharing, discussing, improving and linking the procurement reasoning to reasoning and trade-off decisions on higher levels of strategy.

The main thing the procedure proposal aims to ensure in this respect is that time and attention for the explication of implicit reasoning is organized. The procurement official accountable for the development process concerned should be responsible for managing that explication by relevant colleagues and stakeholders occurs. The use of the causal mapping method is proposed to facilitate deliberate creation of strategic alignment during the development process.

7.4.2 HOW TO 2: Procedure for the reuse consideration process

The second main concrete result of this study is a detailed procedure proposal for the reuse consideration process. Chapter 6 presents how in this research a procedure has been developed and implemented in the client's quality management system. This procedure is an operationalization of the identified need to implement an integration mechanism. The procedure describes a sequence of activities and allocation of responsibilities to ensure that future reuse of a newly developed procurement instrument is considered, and, if deemed worthwhile, facilitated by implementing a deliberately selected knowledge management strategy. Key to this consideration is the instrument's potential to contribute to the client's strategic goals.

7.4.3 Summary

In summary, the way forward to achieve the desired situation concerns the use of two procedures. Although procedures for managing the portfolio of standardized instruments and for selecting appropriate instruments for upcoming sourcing projects were in place in the procurement department's quality management system, the research identified two missing

procedures. By developing these procedures in this research, the set of procedures necessary to manage procurement instruments purposefully is now completed.

7.5 Conclusion

The results of the five separate studies of this thesis can be usefully combined to provide greater overview and enable discussion on an aggregated level. Combining the thesis outline of IST, SOLL and HOW TO with the thesis' three main theoretical concepts, this chapter has provided a matrix in which the study results have been systematically summarized. This way, the syntheses paves the way for the next chapter, which concerns the conclusion and discussion of this thesis.

Chapter 8

Conclusions and discussion

8.1 Introduction

Procurement instruments play a key role in the procurement process. The use of these instruments results in the selection of suppliers and the awarding of contracts, and the shaping of the contractual arrangement between client and contractor. Operating in an ever-changing environment, public clients need to apply new instruments every now and again. This thesis concentrates on this need. Literature sparsely explains how public clients, or any type of organization, manage procurement instruments. This is not explained in general, nor with regards to the development or reuse of new instruments in particular. It is thus unclear which organizational processes are involved, for instance, how new instruments are developed, applied in sourcing projects, and reused in successive projects. Consequently, no theoretical guidelines exist for how public clients can best organize the development, application and reuse of new procurement instruments.

This thesis explored how procurement instruments can be purposefully managed. The research was conducted for, and in the context of, one specific public client organization only. The research was triggered by the perception that in this organization the development of procurement instruments involved several shortcomings. The introduction section formulated one overall research question, and five sub research questions to structure the research. Based on the syntheses of results presented in the previous chapter, the present chapter formulates the answers to the research questions. In addition, it discusses the contributions to science and practice, and reflects on the limitations that are inherent to this research. Finally, it outlines directions for further research.

8.2 Conclusions

8.2.1 Sub question A: Current situation lacks higher purpose?

The first research question concentrates on the current situation. It is based on the suspicion that the client's current practice of procurement instrument development is lacking higher purpose, at least when viewed from a higher level than that of the single sourcing project. Since this suspicion needs to be substantiated with empirical evidence, research sub question A thus questions whether lack of higher purpose truly is the case.

The research results confirm the suspicion. Instrument development indeed is lacking purposes higher than serving the project at hand. Initial evidence for this conclusion is given by the reconstructed project alliancing development pattern, where lack of purpose is demonstrated by the apparent unconscious evolution of the main alliancing procurement instruments. Additional evidence is given by the other case studies. Although procurement officials develop new instruments or customize current instruments to perceived sourcing project characteristics, the project documentation is mostly unclear about why a certain instrument is preferred, why further development is required, and how such choices link with higher level strategy.

This is not simply caused by negligence to document main motives, but also by unconscious implicit reasoning. Several case study results demonstrate that procurement officials are unaware of each other's reasoning behind procurement instruments, or even of the fact that similar instruments were previously developed by colleagues. Implicit reasoning on instrument design, process design and alignment (if considered), and future reuse seems common practice.

Of course, this does not prove that procurement officials had no strategic goals in mind at all. However, what it does prove is that a connection with higher purposes, in the sense of adjusting instrument design or process design to department strategy, organizational strategy or strategic goals, is not documented. Also, it is improbable that such connections are explicitly made. Both the case study results and the officials' recognition indicate there is ample evidence for this conclusion. Therefore, in the current situation, instrument development and reuse comes across as lacking higher purpose.

8.2.2 Sub question B: How to position the development process?

Sub question B concerns the positioning of the development process against other organizational procurement instrument processes. Since it is evident that the public client both uses extant procurement instruments and develops new ones, but unclear which processes are involved and how these relate, the question is how the development process links with other instrument management processes.

The answer to this question is provided by the identification of a cycle of four main instrument management processes. These are the portfolio configuration management process, the selection process, the development process, and the reuse consideration process. In this cycle, the development process is positioned between the selection process and the reuse consideration process.

This cycle of four main processes is normative, rather than representative, for current practice. The underlying notion is that running the development process should be considered only when current standardized instruments are not appropriate for achieving the goals concerned. In contrast, the case studies demonstrate that the development process is sometimes started without careful checking whether current instruments could already solve the perceived problem. The positioning of the development process between the selection process and the reuse consideration process thus aims to prevent procurement officials from reinventing the wheel.

It follows that the development process should not be considered as a stand-alone process, but as one of four logically related main instrument management processes. Also, its process design requires deliberate explication of reasoning and decision making. This stands in contrast with current practice, since the client's quality management system only identifies and describes the portfolio configuration management process and the selection process.

Finally, the research also considers the relation between procurement reasoning and these four organisational processes. It theorizes that procurement reasoning can occur both within and

without these four main processes, and that it can be understood as argumentations and generalizations. Both are the result of the knowledge management phases of knowledge creation and acquisition, storage and retrieval, transfer and sharing, and knowledge application. Taken together, this research refers to these phases as the reasoning process.

This concept of procurement reasoning is relevant for the development process, since the reasoning affects the design of the newly developed procurement instrument. Unless reasoning is explicated, it cannot be shared, and thus challenged and improved, by other procurement officials.

8.2.3 Sub question C: How to tailor strategic alignment?

Extant public procurement literature offers no conceptualization of the strategic alignment concept that is adequately tailored to the procurement instrument context. Research sub question C addresses this issue. Given that strategic alignment seems a very appropriate concept to provide overall purpose to procurement instrument management, the question is how this concept can be customized.

This thesis customizes the strategic alignment concept to the procurement instrument context as follows. First, it adopts the insights of previous research with regards to multiple levels and dimensions of strategy. Second, it theorizes that the strategies on these levels and dimensions consist of reasoning and trade-off decisions. Third, it goes on to theorize that the reasoning behind procurement instrument design concerns the most operational level of strategy formation. Higher level strategies thus need to be translated to instrument design choices. Fourth, it theorizes that the completion of the tender documentation marks the end of the strategy formation phase and the beginning of the strategy implementation phase. Finally, it demonstrates that strategic alignment can be usefully perceived as the extent to which reasoning and trade-off decisions on multiple levels and dimensions of strategy form logically valid means-and-ends relationships. It also demonstrates that causal mapping forms a practical means to visualize and assess this alignment.

Strategic alignment is thus customized as a concept that ultimately relates instrument design with strategic goals. The extent to which alignment is achieved depends on the logical validity of the means-and-ends relationships. Purpose in procurement instrument management is thus constituted by the level in which instruments align with the various internal and external strategies and with supply market characteristics.

8.2.4 Sub question D: How to deliberately create strategic alignment?

Sub question D explores how in practice the instrument development process can be managed in such a way that strategic alignment is deliberately created. Clearly, the current situation is far off from explicit creation of strategic alignment. Consequently, it would be difficult for procurement officials to convincingly demonstrate that the procurement instrument development process is purposefully managed.

The research approach chosen to answer this question concerns the development and application of a concrete, workable procedure. Given the finding that implicit process design impedes explication of procurement reasoning, the research aimed to address both issues. Explication of process design is addressed by writing out and sharing a procedure proposal that allocates roles and responsibilities for managing the instrument development process. Explication of implicit procurement reasoning is addressed by allocating the responsibility for sharing, combining and improving the procurement reasoning to one official in particular and highlighting in which activities explication is needed. Also, the procedure describes how the causal mapping method can facilitate the explication and linking of procurement reasoning to higher level strategies. The usefulness of this procedure was tested with procurement officials.

It can therefore be concluded that deliberate creation of strategic alignment during the development process can be managed by being clear about both development process design and the role of procurement reasoning in that process.

8.2.5 Sub question E: How to purposefully manage reuse?

Instrument development is not a goal in itself. Therefore, next to the development process, also a reuse consideration process was identified in this research. This process is necessary to capitalize on successful newly developed procurement instruments. Sub question E thus concentrates on how the reuse of successful new instruments be can purposefully managed in practice.

Similar to the research approach for sub question D, a concrete and workable procedure was developed to define activities and allocate roles and responsibilities. After try-out in practice, this procedure was incorporated in the procurement department's quality management system. Ambidexterity forms the theoretical background to this procedure. Recognizing instrument use and gradual improvement as exploitation, and new instrument development as exploration, the question is how exploration results can be integrated with exploitation. According to ambidexterity researchers, careful design and implementation of integration mechanisms is necessary to balance exploration with exploitation. The reuse consideration procedure thus forms an operationalization of ambidexterity's integration mechanism.

Also in this procedure, the key to purposeful management of instrument reuse concerns the assessment of strategic alignment. Rather than the success achieved in its first application, the potential for future strategic contributions determines whether future reuse should be facilitated. To conclude, the reuse of successful new instruments be can purposefully managed in practice by implementing an integration mechanism that deals with the tensions between exploitation and exploration, and that ensures that reuse decisions are based on the extent to which the instrument aligns with strategic goals.

8.2.6 Answer to the overall research question

Together, the answers to the research sub questions lead to answering the overall research question, since it encompasses all other questions at an aggregated level. In the introduction chapter, the overall research question was formulated as follows:

How can the development and reuse of new procurement instruments be managed in procurement practice in such a way that these instruments purposefully contribute to the public client's strategic goals?

The general conclusion of this thesis is that purposeful management of procurement instruments can be achieved by deliberately organizing not only the exploitation, but also the exploration and integration of procurement instruments. Especially with regards to the development and reuse of new procurement instruments, it is important that implicit reasoning behind procurement instrument design is explicated. Such explication is vital, because it enables that the strategic alignment between the instrument in question and the organization's strategic goals can be rationally assessed, demonstrated and taken into account when making decisions in the instrument management processes.

8.3 Scientific contribution

The scientific contribution of this thesis is discussed by its contribution to public procurement literature. This field of literature seems the most appropriate to position this research in. Different positioning could also be justifiable, since this thesis drew from many other fields of literature, including private purchasing and supply management, construction management, knowledge management, and strategic management. Also, several papers from this research have been published in construction management journals. However, given its aim to enhance the purposeful management of procurement instruments by a public sector client, the emphasis of this research is on public procurement. To be more specific, the emphasis is on organizing purposeful development and reuse of procurement instruments. In terms of the classification framework employed by (Patrucco, Luzzini et al. 2017), this thesis classifies best as a study on public procurement organization.

As a general remark, it can be observed that this thesis addresses three previously identified gaps in public procurement literature. In their assessment of research perspectives on public procurement, Patrucco et al 2017 identified a number of research gaps and suggestions for future research. This thesis acted upon three of their suggestions. The first is to "Introduce a broader set of research approaches, including less adopted methodologies (e.g., collaborative research)" (Patrucco et al. 2017, p. 262). This thesis has adopted two specific forms of collaborative research, namely Action Research (Azhar et al. 2009) and Design Research (Wieringa 2014). The second suggestion is to "Explore if and how procurement strategies are aligned with the government and other Departments strategies" (Patrucco et al 2017, p. 262). Forming the heart of this study, this thesis has profoundly elaborated the alignment of procurement strategies with other strategies. The third suggestion is to "Explore the use and impact of advanced tools and procedures for supporting procurement activities" (Patrucco et al.

2017, p. 263). This thesis has developed two procedures for supporting several activities of the public procurement process.

However, the main scientific contribution of this thesis in essence concerns the tailoring of general theoretical concepts to the field of public procurement. To be more precise, its main contribution concerns the *conceptualization* and *operationalization* of these concepts for the specific context of procurement instrument management. The research was triggered by the practical need to think through this aspect of current procurement practice and help improve it. Since procurement instrument management is not a research theme in the literature, the first challenge was to find theory that is appropriate for examining and improving current practice. The search resulted in the choice to apply three general theoretical concepts: a) strategic alignment, b) organizational ambidexterity and c) tacit knowledge. However, public procurement literature on these three concepts is either scarce or absent (Flynn and Davis 2014). Consequently, considerable research effort needed to be put in the tailoring of these concepts to the specific context of procurement instruments. This is why this thesis comes up with conceptual models for each theoretical concept (conceptualization) and attempts to apply these models in empirical case studies (operationalization). This is also why the author considers these as the main scientific contributions.

To further clarify why these conceptualizations and operationalisations are considered main contributions, these are discussed now in the light of four research streams: 1) the professionalization of the procurement function, 2) the elaboration of strategic alignment for the public procurement process, 3) the elaboration of organizational ambidexterity for procurement instrument management and 4) the application of knowledge management in public procurement. These debates primarily take place in the private sector purchasing literature (from here: the *purchasing* literature), and to a lesser extent also in the public procurement literature (from here: the *procurement* literature). Since public procurement research can learn from its private equivalent (Arlbjørn and Freytag 2012), this discussion also refers to purchasing literature to clarify the contribution to procurement literature.

8.3.1 Professionalization of the procurement function

This thesis contributes to the research stream on the professionalization of the procurement function. In general, procurement function professionalization is often approached from two perspectives: a) the 'strategic procurement' perspective, and b) the 'maturity model' perspective. Also, these perspectives are sometimes combined (Søgaard et al. 2019). This thesis adds procurement instrument management as a relevant research aspect for further professionalization. This concerns both perspectives.

As discussed in the introduction section, strategic procurement originated long since in the purchasing literature (Ellram and Carr 1994). The main idea of strategic procurement is that the procurement function should be included as a key decision maker and participant in the firm's strategic planning processes, so that the procurement function's activities and strategies are specifically patterned to support the firm's overall strategies. This stood, and probably often still

stands, in contrast with a top management's view of procurement as an ancillary function (Ellram and Carr 1994; Matthews 2005). In a famous paper, Carr and Smeltzer (1997) identified four necessary, but not sufficient, conditions to constitute strategic procurement: status, knowledge and skills, risk taking and resources. This stimulated a research stream on strategic procurement that is still ongoing to date. For instance, recent research emphasizes the relevance of purchasing recognition by top managers and other organizational units (Luzzini and Ronchi 2016; Patrucco et al. 2017).

This thesis contributes to the strategic procurement perspective with the insight that procurement instrument management needs to be included as a relevant aspect of strategic procurement. It clarifies that, unless appropriate procurement instruments are used in the procurement process, the procurement of services, goods and supplies cannot be aligned to support the public organization's overall strategies. The explication and linking of procurement reasoning with higher level strategies is one of the skills that procurement officials need to master. The conceptualization of strategic alignment in the form of logically valid means-and-ends relationships, and the operationalization in the form of procurement instrument design are specific contributions to the strategic procurement perspective.

The second main perspective on procurement function professionalization concerns the use of maturity models. These models are held to guide the professional development of the procurement function (Søgaard et al. 2019; van Zoest et al. 2019). Maturity models commonly concern a matrix with *aspects* of procurement practice such as strategy, people, organization process or activities, suppliers and communication, on one axis, and *levels* of maturity on the other (e.g. Úbeda et al. 2015). Procurement functions can assess their maturity against such models, which is assumed useful because higher procurement maturity is associated with increased performance (Søgaard et al. 2019).

This thesis contributes to the maturity model perspective with the insight that procurement instrument management needs to be included. Although procurement instruments play a key role in the public procurement process, instrument management is not part of any current maturity model yet. This thesis clarifies *why* procurement instrument management is as an essential aspect of procurement practice. Also, this thesis suggests *how to improve* procurement instrument management. This is stressed, because maturity models are criticised for several reasons (Andreasen and Gammelgaard 2018; Søgaard et al. 2019), one of them being that maturity models commonly do not specify the purchasing tools and methodologies that should be used to enhance the procurement maturity level (Úbeda et al. 2015). However, the procedure development and implementation reported this thesis has increased the maturity in the client's organization from the 'ad hoc' process level to the 'standardized' level, and these procedures are probably applicable in other organizations too. Therefore, this thesis contributes by specifying a maturation aspect, a possible maturation path, the rationale behind maturation, and the level of granularity on which maturation can be observed (Röglinger et al. 2012). All of these items are important when suggesting how improvement can be achieved.

8.3.2 Strategic alignment in the public procurement process

The second research stream this thesis contributes to concerns the application of strategic alignment (Venkatraman and Camillus 1984) to public procurement. While the strategic alignment concept is not new to public sector literature in general (e.g. Andrews et al. 2012), nor to procurement literature in particular (e.g. Glas et al. 2017; Patrucco et al. 2017), a detailed elaboration of how this concept can be applied with regards to the public procurement process has not been given before.

Up to the paper by Glas et al. (2017), application of the strategic alignment concept was sparsely explained in the procurement literature. The terms 'fit' or 'alignment' were used without almost any clarification of why and how it should be applied in daily practice (e.g. Schapper et al. 2006; Murray 2009). With regards to the public procurement process, the most clear explanation so far thus concerned the work of Patrucco et al. (2017). They proposed a framework that identifies four types of public procurement strategy alignment, but still leave many questions unanswered.

Next to the contribution in terms of conceptualization and operationalization of strategic alignment for the public procurement context discussed already above, this thesis provides four specific contributions to this research stream. First, it spells out how strategic alignment can be achieved. While previous procurement literature states *that* achieving strategic alignment is essential (Patrucco et al. 2017), it remains ambiguous *how* the concept can be applied in the specific context of the public procurement process. It is unclear exactly what constitutes strategic alignment and which criteria are used to assess it. Also, it is unclear how exactly the various procurement strategies should be understood. This thesis contributes by operationalizing both the alignment concept (in terms of logically valid means-and-ends relationships) and the term 'procurement strategies' (by distinguishing between reasoning behind procurement instrument design and higher level strategies).

Second, the *qualitative* approach to operationalizing the alignment concept adds to both the procurement literature and the purchasing literature. As discussed above, the conceptual framework of Patrucco et al represented current state of art for the procurement literature. Therefore, this research also drew from strategic alignment research in the purchasing literature, which is far more advanced. However, in the purchasing literature, alignment studies usually employ a quantitative approach, seeking statistical support for hypotheses that strategic alignment between certain constructs of procurement practice affect certain constructs of performance (Søgaard et al. 2019). Useful as such research may be for validating the supposed benefits of alignment, it is not very helpful for understanding how strategic alignment can be assessed with regard to procurement instruments. This understanding is essential, since procurement instruments form the most operational part of procurement strategy formation. The contribution of this thesis is that, in contrast to the aforementioned high level constructs, it provides a workable operationalization of strategic alignment in terms of logically valid means-and-end relationships.

Third, this thesis expressly demarcates the scope of the strategic alignment concept. While strategic management literature consistently distinguishes strategy formation from implementation (Mintzberg et al. 2009; Bryson 2010) extant procurement and purchasing literature on strategic alignment is unclear as to its coverage in this regard. In contrast, by viewing the tendering phase as the start of strategy implementation the public procurement process, this thesis suggests a clear cut: strategy formation ends with the finalization of the tendering dossier. The reason for this cut is that strategy formation in procurement is viewed in this thesis as a process that may start high level, but invariably ends with the selection or development of procurement instruments for a given tender procedure.

Fourth, this thesis is clear about its theoretical grounding of strategic alignment. Although this is not a major achievement, it is worth mentioning, because current literature often is ambiguous about the theory concerned. According to Flynn and Davis (2014) only about one third of procurement literature is theoretically grounded. Also, it is not self-evident to ground strategic alignment on contingency theory, since, for instance, Andrews et al. (2012) approach alignment from the principal-agent theory. Being clear about the theoretical grounding for strategic alignment thus enables contrasting this research approach with alternative approaches, which is beneficial for further discussion and research.

8.3.3 Organizational ambidexterity in the procurement context

The third research stream this thesis contributes to exists primarily outside the procurement and purchasing literature. This concerns organizational ambidexterity. Since organizational ambidexterity was not used in the procurement literature before, the application of this concept to procurement instrument management automatically implies the introduction of a theoretical concept that is novel and relevant for this particular field of literature. Organizational ambidexterity is even quite novel in the purchasing literature (Gualandris et al. 2018). However, it is evidently not so much the introduction of this concept that constitutes the research contribution. Of more value is the conceptualization and operationalization of this concept for the specific context of procurement instrument management.

The contribution to procurement literature concerns four specific aspects. First, this thesis shows that organizational ambidexterity can be a relevant theoretical concept for public procurement research. This is not self-evident, since some argue that organizational ambidexterity is relevant only for explaining how *firms* deal with threats to company survival (e.g. O'Reilly and Tushman, 2013). However, this thesis demonstrates that it is relevant for public procurement too, since the case study results show that organizational ambidexterity is useful for explaining the tensions that procurement officials face when dealing with exploitation, exploration, and integration of procurement instruments.

Second, this thesis develops a conceptual model for ambidexterity in the public procurement context. This conceptualization explains how the general terms of exploitation, exploration and the integration mechanism can be meaningfully used for procurement instrument management. Identifying and transposing the integration mechanism is particularly relevant in this regard,

since ambidexterity in general is often described in terms of exploitation and exploration only (e.g. Brix 2019).

Third, this thesis operationalizes the integration mechanism of a concrete procedure for the procurement function. This concerns not only a contribution to procurement literature, but also to the general ambidexterity literature. One reason is that, although various types of integration mechanisms are summed up in the literature (Markides 2013), concrete operationalizations are seldomly described, which is not helpful for advancing understanding of the ambidexterity concept. Another reason is that the type of integration mechanism developed in this study (a procedure) was absent in the literature. However, this thesis demonstrates that procedures, as facilitators for routine development, can enhance integration of exploration with exploitation.

The fourth aspect in which this thesis contributes concerns the application of organizational learning theory to public procurement, which is also novel (Flynn and Davis 2014). Organizational learning theory (Crossan et al. 1999) was employed to develop a more sophisticated conceptualization of the integration mechanism, one which addressed the multiple ambidexterity levels that often are missing in ambidexterity research (Birkinshaw and Gupta 2013). This reconnecting of ambidexterity and organizational learning literature supports the argument put forward by Brix (2019, p. 344), who state that the organizational learning literature has a more advanced view that the ambidexterity literature with regard to how and by whom transitions between exploration and exploitation can take place. Also, this reframing demonstrates how organizational learning theory can be meaningfully applied in public procurement research.

8.3.4 Knowledge management in the procurement context

The fourth research stream also exists mainly outside the procurement and purchasing literature. While knowledge management is identified as a relevant factor in the transition towards strategic procurement (Larson 2009), public procurement literature on this topic is scarce. According to Patrucco et al. (2017), knowledge management is considered in only 1% of public procurement research. In purchasing literature, knowledge management is also no significant research topic (Spina et al. 2013), although knowledge based theory is recognized as one of the so-called external grand theories to purchasing research (Spina et al. 2016). The contribution of this thesis thus concerns the elaboration of general knowledge management theory for the specific context of public procurement. Two specific aspects of research contribution can be identified. However, given the paucity of procurement and purchasing literature on this topic, these aspects need to be considered with reference other fields of literature.

First, this thesis contributes to procurement literature by conceptualizing the four basic knowledge management processes (Alavi and Leidner 2001; Ragab and Arisha 2013) for the specific context of procurement instrument design. The resulting conceptual framework includes the concept of tacit knowledge (Polanyi 1966). To the best of the author's knowledge,

this framework, and the framework employed by (Hazlett et al. 2008), are the only models to describe knowledge flows in a public procurement setting.

Second, this thesis contributes by operationalizing this conceptual framework and applying it in an empirical case study. This in itself is quite unique, since according to (Serenko et al. 2010, p. 17), pragmatic field studies such as in this thesis, which require an active cooperation of practitioners, constitute less than 1 percent of all inquiry methods in Knowledge Management research. However, the main contribution concerns the identification of procurement reasoning as a specific type of procurement knowledge. Recent literature identifies six knowledge domains for public procurement officials (Williams, Lau et al. 2018). One of these knowledge domains concerns 'sourcing', which, among many other things, is associated with knowledge on procurement methods and techniques, contract types, and contract terms and conditions (Williams et al. 2018, p. 56). The contribution of this thesis in this regard is that it takes a more actionable perspective on procurement knowledge by focussing on a specific type of knowledge (reasoning on procurement instruments) as part of the strategy formation process. Also, in contrast to the summing up of knowledge elements, this thesis empirically illustrates how such procurement knowledge can be understood.

Third, this thesis contributes to procurement literature by identifying the method of causal mapping as a helpful means to get officials articulate implicit reasoning. As explained by (Bryson et al. 2004, p. 119), this method helps practitioners to avoid 'going over the same ground' time and again. Writing out one reason helps to focus on other reasons that are less in view.

8.4 Practical contributions

The practical contribution of this research primarily concerns a) the conceptualization of the documents, systems, or methods used in the procurement process as procurement instruments, b) the substantiation of the need to manage procurement instruments purposefully, and b) the concrete proposals for how this can be done. This thesis identifies contracts, supplier selections systems, contract award methods, and other means used in the procurement process as a specific set of organizational resources. Identifying these means as a specific resource type and conceptualizing these as procurement instruments is in itself probably not ground-breaking for practitioners. However, the practical relevance of utilizing the term procurement instruments is that it helps to perceive these instruments differently. Contracts, supplier selections systems, contract award methods and the like are not just plain and inevitable elements to support the sourcing project. Instead, these are *instruments*, part of the procurement officials' *toolkit*, used to *shape* the procurement process in order to contribute to *strategic* goal achievement. Knowing when to apply which combination of instruments requires sophisticated knowledge of the reasoning behind these instruments. Also, changing instrument design, or developing new instruments, requires in-depth knowledge of extant procurement instruments, supply markets, and internal and external strategies.

This view also indicates that procurement instruments need to be managed purposefully. The second practical contribution of this thesis is that it substantiates this need. It shows concrete

examples of procurement instruments that evolved unconsciously over the course of multiple projects. Although this thesis presents no calculation of costs and benefits of instrument development, it is clear that such 'wild' development patterns imply inefficiencies. Of course, instrument reinvention is a very clear example of inefficiency. However, inefficiency also relates to other, less evident, aspects. For instance, from a strategic point of view, the spending of scarce resources on instrument development for a specific sourcing project can deserve less priority than other procurement activities. Unconsciousness of the costs of instrument development can thus lead to, for instance, lack of resources for proper evaluation of instrument effects or facilitating instrument reuse. Also, this thesis emphasizes that instrument development can be ineffective if the higher level strategies are not taken into account. Purposeful management of procurement instruments thus is necessary to efficiently contribute to organizational goals.

Finally, this thesis contributes to practice by detailing out hands-on procedures for purposeful management of development and reuse of procurement instruments. 'Knowing that' is one thing, 'knowing how to' another, even though some philosophers may disagree (Wiggins 2012). The value of these procedures is that they translate the theoretical concepts employed in this thesis into operationally workable descriptions of activities and responsibilities. This is not straightforward, since purposeful procurement instrument management involves deliberate action at individual, group and organizational level. Given the inherent differences in knowledge levels and knowledge needs of various types of procurement officials, it is necessary that the interaction between these levels is deliberately organized. Also, whereas probably nobody will argue against the need to create strategic alignment, discussions about how it can be created are prone to arise if there is no concrete and shared idea of what strategic alignment actually means in procurement practice. The procedures proposed in this research help to turn these insights into action.

8.5 Research limitations

This research was performed through case studies. Four aspects are generally considered important in the assessment of case study research. These are 1) construct validity, 2) internal validity, 3) external validity, and 4) reliability (Yin 2014). This section discusses the research limitations from the perspectives of these four aspects.

Construct validity concerns the accuracy with which a case study's measures reflect the concepts being studied (Yin 2014). Implicit reasoning is a key construct in this study. It is derived from the knowledge management literature that views tacit and explicit reasoning as both ends of a continuum (Nonaka and Von Krogh 2009). As a construct, implicit reasoning is very difficult to measure, since it is rather unclear which part of the continuum is represented by it. Surely, implicit reasoning was recognizable in interviews, when interviewees hesitated and stumbled when trying to articulate their reasoning. However, this research did not attempt to create a measurable scale. Instead, it relied on clear contrasts, such as documented reasoning versus articulated reasoning. Implicit reasoning was held to occur if procurement officials clearly missed

an element in the means-and-ends relationships. This pragmatic dealing with the construct has barely helped to advance the accuracy in which this construct can be applied in research.

The lack of measurability of the implicit reasoning construct also affects the internal validity of this study. Internal validity reflects the strength of a cause-effect link made by a case study. The cause-effect link made in this study is that implicit reasoning impedes the creation of strategic alignment. This is true in the sense that alignment cannot be demonstrated to others if the procurement official in question cannot articulate his or her reasoning. However, this does not exclude the possibility that in effect there is no alignment.

External validity concerns the problem of knowing whether a study's findings are generalizable beyond the immediate study, regardless of the research method used (Yin 2014). Since the present research only conducted case studies, the term 'generalizability' only refers to analytic generalizations (in contrast to statistical generalization). The analytic generalization of this study concerns the relationship between implicit reasoning (cause) at the level of single procurement instruments to wild development patterns (effect) and, ultimately, a lack of purpose in instrument management (effect). This relation may be expected to occur in many public client organizations, regardless of their specific characteristics. Also, the external validity of this study probably is high in the sense that the constructs of implicit reasoning, development process and reuse consideration process can apply to other procurement functions. Finally, the theoretical concepts of strategic alignment and organizational ambidexterity operationalized in this study are not highly dependent of the specific characteristics of the organization that was studied in this research.

However, since it can be difficult *not* to think in terms of statistical generalization, it should be observed that the extent to which the evolutionary patterns and examples of implicit reasoning of this research accurately reflects current practice both in this study's organization (ProRail) and in other organizations is not researched. Whereas ProRail operates a high number of procurement instruments, this research only concerns a limited set of procurement instruments. Many of these are standardized portfolio instruments that are carefully evaluated and improved. To view the set of case studies as a representative sample would thus be wrong, not only because this would concern the statistical generalization line of thinking, but also simply because it is not representative in numbers of procurement instruments or sourcing projects.

With regard to other organizations, it should be noted that similar case studies at other public client organizations have not been conducted in this research. Given the aim of this research, data were only gathered from the client organization (ProRail). The fact that ProRail characterizes as a high-outsourcing, multi-project, and major public client in the Netherlands perhaps influences the results. ProRail's procurement function is organized in the form of a separate department specialised in public procurement and counts a substantial number of procurement officials. Research enumerates several other aspects of organizational design, including macro level dimensions (category, business unit, geography, activity) and micro level dimensions (degree of centralization, formalization, specialization, participation and

standardization) (Bals et al. 2018). This thesis has not analysed how ProRail's characteristics may have influenced the case study results.

Finally, reliability concerns the consistency and repeatability of the research procedures used in the case studies. This research relied on several research procedures, including examination of project archives, interviewing key procurement officials and conducting design science and action research. Such triangulation is generally held to improve consistency of findings (Yin 2014). Also, consistency over the various case studies with regards to how the constructs were approached is high. With regards to repeatability, it should be observed that the research procedures concerned specific sourcing projects. These projects are time bound, and the organization in question evolves continually. Moreover, this research affected current practice. Development process and reuse consideration process are not new constructs anymore. Repeating the research procedures in the same organization with the same research procedures would therefore probably only make sense with regard to the reconstruction of instrument development patterns.

8.6 Recommendations for future research

The character of this research is essentially exploratory. It contributes to theory building, but it does not test theory. This classification fits with the current state of public procurement research. According to (Patrucco et al. 2017), as an academic discipline public procurement is far from full maturity. The recommendations for future research should be seen from this perspective.

First of all, the ideal situation described in this research is not yet achieved. This research delivered procedures with the expectation that these will create the context in which organizational routines develop. However, the research does not extend to this phase of routine development. Monitoring procedure compliance, improving process maturity, and examination of routine creation and replication (Davies et al. 2018) is needed to monitor whether purposeful management of procurement instruments will be achieved by the procurement department's officials. Future research in this respect probably beneficial to help overcome impediments to achieving the ideal situation.

Second, this research is demarcated to exploration and integration of new procurement instruments only. However, the implicit reasoning and lack of assessing strategic alignment also seems to occur in the exploitation of procurement instruments. Decision making in both the configuration management process and the development process is therefore expected to benefit from explicating implicit reasoning, assessing the instrument's alignment, and taking the outcome into consideration. Future research could investigate whether the conclusions for the development and reuse of procurement instruments are equally applicable for these processes.

Third, it would be beneficial to examine the link between procurement instruments and organizational performance. This would substantiate the main assumption of this research, which is that procurement instruments can contribute to overall organizational performance.

Testing of this link would thus be very useful to further stress the need for achieving purposeful procurement instrument management. To appropriately test this link, the construct of organizational performance for the specific context of the public sector client needs to be developed. Also, testing requires taking into account the influence of other factors in the implementation phase, foremost contract management. This is important, because although procurement instruments can be very sophisticated, their effects may be limited when not used properly in the contractual phase.

Fourth, it would be interesting to investigate whether purposeful management of procurement instruments actually helps to increase the status of the procurement function. Previous literature stresses that procurement participation in the organization's strategic planning process is essential for delivering a strategic contribution (Carr and Smeltzer 1997). Since explication of alignment between procurement instrument design and strategy helps to demonstrate why and how procurement can contribute to strategic goal achievement, it is reasonable to assume that this capability will enhance procurement function status. Future research could test whether this assumption is correct and explore the impact of this capability on strategic procurement.

Finally, future procurement maturity model research should elaborate how procurement instrument management fits in the maturity scheme. Current models identify certain aspects of procurement practice, but so far ignored instrument management. Given the importance of using appropriate procurement instruments, purposeful instrument management should be considered as core business of the procurement function.

Glossary

Several terms are central to this thesis and have been tailored to the procurement context.

- *Ambidexterity:* Ambidexterity refers to the procurement function's capability to balance the use and development of Procurement Instruments.
- *Development process:* One of the four Main procurement instrument management processes, referring to the process that is run to come up with new Procurement Instruments, i.e. that are distinctive to the instruments currently used by the client's organisation.
- *Explication:* The articulation or writing out of Procurement Reasoning.
- *Exploitation:* the use, evaluation and incremental improvement of Procurement Instruments that have been used before. Exploitation stands in contrast to Exploration. Both terms are central components of the Ambidexterity concept.
- *Exploration:* The development of new Procurement Instruments or the search for and adoption of new instruments developed elsewhere. Exploration stands in contrast to Exploitation. Both terms are central components of the Ambidexterity concept.
- *Integration:* The activities involved in making a new Procurement Instrument available for general use in the client's organisation. Integration is a condition for achieving Ambidexterity.
- *Main procurement instrument management processes:* The management of Procurement Instruments in the client's organization involves at least four main processes: Portfolio management process, Selection process, Development process and Reuse consideration process.
- *Portfolio configuration process:* One of the four Main procurement instrument management processes, referring to the process that is run to maintain the Portfolio of standardized Procurement Instruments. This can involve the improvement of current standardized instruments, the admission of new instruments, and the disposal of standardized instruments that are no longer of use).
- *Portfolio of standardized procurement instruments:* the set of Procurement Instruments that have been made available for general use. Often these instruments concern document templates that only require the filling out of project specific data.
- *Procurement Instrument:* One single component of a Procurement System, as demarcated in practice. This includes components such as contracts, requirement specifications, and contract award methods. This term is introduced in this thesis to refer to the aggregation level below the Procurement System.
- *Procurement Reasoning:* The reasoning on expected or experienced effects of a certain Procurement Instrument. Procurement Reasoning is the outcome at a given point in time of the Reasoning Process.
- *Procurement Strategies:* The reasoning and trade-offs present at multiple hierarchical levels inside and outside the client organisation that relate to how the procurement in a given buying situation should be performed.
- *Procurement System:* The complete set of Procurement Instruments required to execute the Procurement Process. Often this set boils down to the tendering dossier and the supporting methods and systems for a specific tendering procedure.

- *Reasoning process:* The process that results in Procurement Reasoning. This process can occur at all times and places, also before, during or after one of the Main procurement instrument management processes, within individuals but also between individuals.
- *Re-use consideration process*: One of the four Main procurement instrument management processes, referring to the process that is run to consider whether reuse of a newly developed Procurement Instrument in a future buying situation has merits, and, if so, to facilitate that this instrument can be reused.
- *Selection process:* The process that is run to reach a decision on which collection of Procurement Instruments will be used in a forthcoming buying situation. In the literature this process is discussed extensively (e.g. Love et al 2012), although it is not consistently termed as such.
- *Strategic alignment:* The extent to which Procurement Reasoning on a certain Procurement Instrument logically relates to Procurement Strategies and, ultimately, the public client's strategic goals.
- *Strategic goals:* The main goals set at organization level.

References

This list contains the references to the cited work from chapters 1, 6, 7 and 8.

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List of publications

Journal papers (peer reviewed)

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Scientific conference papers (peer reviewed)

Plantinga, H.E.C. and Dorée A.G. (2013). *Project alliances: an investigation into the logic behind the range of a Dutch public sector client's initiatives.* Paper presented at the 29th Annual ARCOM Conference, Reading, UK.

Plantinga, H.E.C., Voordijk, J.T. and Dorée, A.G. (2014). *Assessing qualification systems: the relevance of explicating implicit reasoning.* Paper presented at the 30th annual ARCOM Conference, Portsmouth, UK.

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Acknowledgements

Staring at the starlit sky makes you wonder about things. I suppose that anyone who has had the experience of gazing quietly at the galaxy will agree with this. It makes you start wondering about the vastness of the universe, about this place we call Earth, or about the nature of life. If you allow your thoughts to float around a bit more, you may end up wondering about wondering. To me it appears that there are so many things one can wonder about, that I very much agree with interpreting the verb 'to wonder' in the sense of knowing one's ignorance before the vast scope of potential knowledge.

The topic of this thesis originated from my wonders about the way my colleagues and I used to go about in the procurement profession. I had been working for more than a decade as a procurement official for ProRail, when all of a sudden the opportunity came along to start a PhD-research. My first inclination was to embrace this opportunity. However, I also had some hesitations that refrained me from rushing off into this adventure. Is it really smart to start a part time PhD-research, knowing that a full time PhD generally takes more than the four years that stand for it? Is it really smart, considering that I have only recently become a father and hope for more children? How will it affect my professional career, considering that ProRail is not engaged much in scientific research? Looking back, I think my hesitations were overcome by my wonders and the appreciation of this rather unique opportunity to get to work with these wonders.

Plato once stated that 'wonder is the beginning of philosophy' (Theaetetus, 155d). The topic I have worked on these past years is clearly less lofty than the topics that the famous philosopher tried to make sense of. However, reflecting on my hesitations to embark on this research project and recollecting my efforts to attain the grade of philosophical doctor, I would like to add a modest and pragmatic consideration to this famous statement. Wonder may be the beginning of philosophy, but the time and energy needed to take thoughts further is often scarce. Modern society is usually characterized by the stress, noise, and rush of everyday life. My life forms no exception. This thesis would not have been completed if I had not been given time and support by the ProRail-organization to elaborate on my wonders as a procurement official.

It is therefore that I first want to express my gratitude to Eric Maatjes, my sector manager at the time, who encouraged me to start this research project. Eric, you have always supported this research, always found the time to discuss its content and progress, and even after your retirement you were always available for reviewing my papers. Thank you for proposing this wonderful adventure and for your encouragement and support along the way.

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About the author

Henrico Plantinga was born in 1976 in Kampen, the Netherlands. After obtaining his degree in Civil Engineering and Management at Twente University in 1998, he commenced the study of national law at Utrecht University. During the study's second and third year, he worked part-time for the project organisation High Speed Line South. This employment made him switch over to ProRail, where he finished his fourth year of study and obtained his degree in national law in 2002. Working full time since then at ProRail's procurement department, Henrico gained practical experience as a procurement official. While his procurement activities concerned various technical fields, his main fields concern construction and signalling projects. Over the years, both the formation of procurement strategies and the development of innovative procurement instruments to operationalize and implement those strategies kept his main interest. In 2013, ProRail granted him the opportunity to embark on a part-time PhD research project. Gratefully accepting this opportunity, Henrico came to start this PhD under supervision of Twente University. Henrico is married and proud father of three sons.

Public procurement is increasingly becoming a core responsibility for many public organizations. Some public organizations outsource such large volumes, that their level of public service provision is strongly affected by the performances delivered by their contractors. Especially for such high-outsourcing public organizations, it is crucial to achieve high standards in procurement. Recognizing that procurement instruments shape the procurement process and affect contractor performance, this PhD thesis examines the notion that purposeful management of these instruments is an essential organizational capability to continuously meet these standards.