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Relational Contracting in the Construction Industry

Applying the Sourcing Business Model theory to research a contract's influence on the cooperation between client and contractor

Author:
Ellen Kok (S2563576)

Supervised by:
Drs. Ing. Hans Boes
Ir. Jesper Pots

Second assessor:
Dr. Fatemeh Karandish

UNIVERSITY OF TWENTE.

Witteveen + Bos

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Author: E. Kok (Ellen)
Student number: s2563576
Contact info: e.kok-1@student.utwente.nl
Degree: BSc in Civil Engineering
Educational institution: University of Twente (UT)
Supervisor UT: Drs. Ing. J. Boes (Hans)
Second assessor UT: Dr. F. Karandish (Fatemeh)
External company: Witteveen+Bos (W+B)
Supervisor W+B: Ir. J. Pots (Jesper)

Address educational institution:
Universiteit Twente
Drienerlolaan 5
7522 NB Enschede (The Netherlands)
+31 (0)534 89 91 11
www.utwente.nl

Address external company:
Witteveen+Bos
Leeuwenbrug 8
7411 TJ Deventer (The Netherlands)
+ 31 (0)570 69 79 11
www.witteveenbos.com

PREFACE

Before you lies the bachelor thesis 'Relational Contracting in the Construction Industry: Applying the Sourcing Business Model theory to research a contract's influence on the collaboration between client and contractor'. It has been written as part of graduating the bachelor programme in Civil Engineering at the University of Twente. The research has been conducted in the period from April to June 2023 and has been supervised by Drs. Ing. Hans Boes, in collaboration with Ir. Jesper Pots on behalf of Witteveen+Bos as external company.

During the period of researching and writing my thesis, I gained many insights about the construction industry, its actors, and their mutual relationships. It was a time to apply the theory that I had been taught in practice, but even more a time to learn about the complexity and versatility of the discipline that defines such a big part of our daily environment. I am grateful for the opportunities that I got through my bachelor thesis: this involves the interesting conversations with both clients and contractors that showed me the different perspectives on the same project, but also the many locations and projects I got to visit during the execution of the research.

I would like to dedicate this section to express my gratitude for the supervision I received throughout the entire process. Hans Boes has closely followed and monitored my progress, and I enjoyed the many discussions we had during our meetings. His broad knowledge about the topic laid the foundation for my research and as soon as my understanding and knowledge expanded, we would discuss my findings and relate them to his experiences. Throughout my day-to-day tasks I could always turn to Jesper Pots, who would spare no effort in showing me everything this discipline has to offer. I appreciate that he always prioritised discussing my progression and the interest he showed in what I was doing, despite his busy schedule. Due to his good intentions, this graduation period has given me so much more knowledge than what is limited to the content of this study.

Besides my direct supervisors, I feel grateful to have been given a place within the company of Witteveen+Bos. The people there welcomed me from the start and would always make time to answer my questions. They connected me to all the interviewees whose insights are part of this report, and whom I would like to thank explicitly for their time and cooperation as well.

Finally, I would like to thank my friends and family who bore with me during these months; through my endless rants, late evenings, and early mornings. I could not have delivered this without their unconditional support and the motivation they gave me. Hence, I am proud to present to you, the reader of this thesis, my findings on relational contracting in the construction industry.

Ellen Kok
Deventer, 29 June 2023

MANAGEMENT SUMMARY

Within the Dutch construction industry, it is common practice to capture every agreement made between client and contractor in a contract: a legal document that serves as the basis of the relationship between the involved parties. Small and uncomplicated projects suffice with a traditional distribution of responsibilities between the two parties, but the complexity of long-term and multi-disciplinary construction projects requires a higher degree of cooperation between the client and the contractor. This need stimulated the rise of relational contracts, which feature a high degree of cooperation between parties to make optimal use of each other's strengths and expertise. The agreements made in such contracts determine how this cooperation can be shaped, which in turn determines the success of the project itself. Hence, the main question to be answered in this research is how the choices made in the contract characteristics influence the cooperation between the client and the contractor and thus the achievement of the project objectives, focused on two-phase contracts within the Dutch construction industry.

To analyse how the cooperation between a client and a contractor is influenced by contractual characteristics, the Sourcing Business Models framework (SBM framework) as introduced by Vitasek et al. (2016) has been used. This framework proposes seven Sourcing Business Models, ranging from transactional contracts to relational contracts and investment contracts. Research of Van de Rijt and Witteveen (2021) stated that 'in order to achieve the project's goals, a high degree of adherence to the characteristics of one [Sourcing Business Model] is required'; however, this research also stated that contracts often include characteristics of different models, a phenomenon that is called 'cherry-picking'. This thesis aims to map contracts against the prior mentioned SBM framework, which has been done for three case studies within the construction industry. Interviews with the involved clients and contractors were conducted to gain insight in their perspective towards the influence of contractual choices on the intended cooperation. The results of the three case studies have been compared to one another and subsequently to the statements in literature, to assess whether these are applicable and relevant to the Dutch construction industry.

After the gathering and comparison of the results, it was concluded that even though no contract follows the characteristics of only one single Sourcing Business Model in the SBM framework, this does not have a negative consequence on the cooperation between the client and the contractor. This can partly be explained by the fact that the parties took the liberty to deviate from the contract in situations where this benefited the cooperation. Besides, it was observed that the original SBM framework contained elements that were not applicable to the construction industry. This led to a proposal for adjustments to the content of the SBM framework, to increase its applicability within the construction industry. The framework can then be used to create awareness of the various ways agreements can be captured in a contract, to show parties that such agreements allow for freedom to shape the desired cooperation. With this knowledge, the suggestion has been made to see the Sourcing Business Models in the adjusted SBM framework as a starting point and means for contract design, rather than a goal that must be achieved.

MANAGEMENT SAMENVATTING

Binnen de Nederlandse bouwsector worden afspraken tussen opdrachtgever en opdrachtnemer doorgaans vastgelegd in een contract: een schriftelijke overeenkomst die dient als basis voor de relatie tussen de betrokken partijen. Voor kleine en eenvoudige projecten volstaat een traditionele verdeling van verantwoordelijkheden tussen opdrachtgever en opdrachtnemer, maar de complexiteit van grote en multidisciplinaire bouwprojecten vraagt om een hogere mate van samenwerking tussen desbetreffende organisaties. Deze behoefte heeft de opkomst van relationele contracten gestimuleerd, die zich kenmerken door een hoge mate van samenwerking tussen partijen zodat deze optimaal gebruik kunnen maken van elkaars kwaliteiten en expertise. De afspraken die zijn gemaakt in dergelijke contracten bepalen hoe deze samenwerking kan worden vormgegeven, en bepalen daarmee het succes van het project zelf. De onderzoeksvraag die daarom centraal staat in dit onderzoek is hoe de keuzes die zijn gemaakt in het contract invloed hebben op de samenwerking tussen de opdrachtgever en de opdrachtnemer en daarmee op de voltooiing van de projectdoelstellingen, gericht op zogenoemde 'twee fasen contracten' binnen de Nederlandse bouwsector.

Om te onderzoeken hoe de samenwerking tussen opdrachtgever en opdrachtnemer beïnvloed wordt door contractuele kenmerken wordt het Sourcing Business Models framework (SBM framework) gebruikt, geïntroduceerd door Vitasek et al. (2016). Dit framework onderscheidt zeven Sourcing Business Models, variërend van transactionele contracten tot relationele contracten en investmentcontracten. Onderzoek van Van de Rijt en Witteveen (2021) stelt dat "het essentieel is dat bij het inrichten van het contract de kenmerken van één specifiek [Sourcing Business Model] worden gekozen", maar uit dit onderzoek is ook gebleken dat contracten vaak eigenschappen van verschillende modellen gebruiken; een fenomeen dat ook wel 'cherry-picking' wordt genoemd. Deze scriptie richt zich dan ook op het in kaart brengen hoe deze contracten passen binnen het eerdergenoemde SBM framework. Hierbij zijn drie afzonderlijke casussen binnen de bouwsector onderzocht, waarbij interviews met de betrokken opdrachtgevers en opdrachtnemers zijn gehouden om inzicht te krijgen in hun perspectief tegenover de invloed van contractuele keuzes op de beoogde samenwerking. De resultaten van de drie casussen zijn met elkaar en met de uitspraken uit de literatuur vergeleken, om te beoordelen of de stellingen uit de literatuur van toepassing zijn op de Nederlandse bouwsector.

Uit dit onderzoek bleek dat ondanks het feit dat in alle drie de casussen de karakteristieken van het contract niet volledig terug te voeren waren naar één Sourcing Business Model in het SBM framework, dit geen negatieve gevolgen had voor de samenwerking tussen opdrachtgever en opdrachtnemer. Dit kan verklaard worden doordat partijen de vrijheid namen om van het contract af te wijken in situaties waarin dit ten goede kwam aan de samenwerking. Daarnaast bevat het SBM framework aspecten die niet van toepassing zijn op de bouwsector. Dit heeft geleid tot een voorstel voor aanpassingen aan het SBM framework, zodanig dat het geschikt is voor deze sector. Op deze manier kan het framework gebruikt worden om bewustzijn te creëren van de verscheidene manieren waarop afspraken in een contract kunnen worden vastgelegd. Dit laat partijen inzien dat dergelijke afspraken de ruimte kunnen bieden waarbinnen de beoogde samenwerking kan worden vormgegeven. Met deze kennis is uiteindelijk de suggestie gedaan om de modellen in het aangepaste SBM framework te beschouwen als uitgangspunt en middel voor de vormgeving van een contract, in plaats van een doel dat nagestreefd moet worden.

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DEFINITION OF TERMS

English term	Dutch term	Definition
	ARBIT	'Algemene Rijksinkoopvoorwaarden bij IT-overeenkomsten', general conditions for IT-products and -services.
	ARVODI	'Algemene Rijksinkoopvoorwaarden voor diensten', general conditions for issuing contracts to the provision of services.
Best Value		Approach based on obtaining the most value within budget in a project.
	BLVC-uitvoeringsplan	Systematic approach to guarantee accessibility (B), liveability (L), safety (V), and communication (C) within the execution phase.
Client	Opdrachtgever	Entity, individual or organisation commissioning and funding the project, directly or indirectly (CIOB, 2022)
Construction design team	Bouwteam	Project-related partnership between a client and a contractor in which the design and execution of the project are concurrently tendered (Hoevink, n.d.).
Contract	Contract	A legal document that states and explains a formal agreement between two different people or groups (Cambridge Dictionary, n.d.).
Contractor	Opdrachtnemer	Someone who undertakes the whole of the construction of a project, but usually in turn sub-letting parts of his work to specialist or trades contractors and others as sub-contractors (The Institution of Civil Engineers, 2020).
Cooperation goals	Samenwerkings-doelstellingen	Goals that should be achieved by the intended or desired degree of cooperation.
D&C contract	D&C contract	Design & Construct contract, where the contractor is responsible for the design and execution of a project.
Design-bid-build (DBB)		A traditional, transactional construction contract type, where there is a clear distinction between the design phase, tender phase (bidding) and construction phase.
Detailed Specifications (DS)	UitvoeringsOntwerp (UO)	Design based on the Final Design, which includes details, materials, and drawings to be followed by the contractor in the execution phase.
	DNR	'De Nieuwe Regeling', general industry terms and conditions for clients' advisors, such as consultancy and engineering firms.
Final Design (FD)	Definitief Ontwerp (DO)	Based on the Preliminary Design, more detailed and focused on how the design will be constructed.
Instructions to Tenderers (ITT)	Aanbestedingsleidraad	Document made by the client provided to prospective bidders with the information about the project and the award criteria.

Investment contracts		A contract focused on insourcing activities and performing the work in-house.
Make-or-buy principle		The decision to either purchasing a product or service from an external supplier, or producing it in-house (Williamson, 2008).
Preliminary Design (PD)	Voorlopig Ontwerp (VO)	First design (followed by the Final Design and Detailed Specifications), describes what is desired to be built.
Procurement	Inkoop	The acquisition by means of a public contract of works, supplies or services by one or more contracting authorities (Directive 2014/24/EU, 2014).
Programme of Requirements	Programma van Eisen	A list of requirements usually made by the client, which defines criteria that the design must comply to.
Project objectives	Projectdoelstellingen	Describe the purpose and desired outcomes of the project.
	RAW-bestek	The Dutch interpretation of a Design-Bid-Build contract. Describes a design as made by the client, to be executed by the contractor.
Relational contract	Relationeel contract	Long-term contract that establishes a relationship between client and contractor, based on mutual trust and cooperation.
SBM framework		Framework describing characteristics of the seven Sourcing Business Models as proposed by Vitasek et al. (2016)
Sourcing Business Model		Combination of the contractual relationship framework you use to work with your supplier and what economic model you use (Vitasek et al., 2016).
Sourcing Business Model theory		[Theory that] suggests that sourcing should be thought of a business model between two parties with the goal of optimising the exchange (Vitasek et al., 2016).
Tender	Aanbesteding	The process by which bids are invited from interested contractors to carry out specific packages of construction work (Finch, 2011).
Transactional contract	Transactioneel contract	Traditional approach in which the industry is engaged to provide a standard service, with competition at procurement (HM Government, 2022).
Two-phase contract	Tweefasencontract	Contract that separates the design phase from the execution phase.
UAC	UAV	Uniform Administrative Conditions, designed for contracts between client and contractor, most tasks and responsibilities regarding the design are for the client.
UAC-IC	UAV-GC	Uniform Administrative Conditions for Integrated Contracts, designed for contracts between client and contractor, most tasks and responsibilities regarding the design are for the contractor.

1 INTRODUCTION

Public procurement is defined as the acquisition by means of a public contract of works, supplies or services by one or more contracting authorities (Directive 2014/24/EU, 2014). This definition implies that there are two parties involved in public procurement: a party that wants to obtain the works, supplies, or services for their own purpose (commonly called 'the client' in the construction industry) and a party that can provide the client with these works, supplies, or services (commonly called 'the contractor'). To ensure that the contractor delivers the desired quality to the client, it is inevitable that there needs to be some form of relation or interaction between these two parties. Formal rules and mutual expectations are written down in an official document that will ensure that everyone abides by these rules. This document is called a contract, which is also defined as 'a legal document that states and explains a formal agreement between two different people or groups' (Cambridge Dictionary, n.d.).

Clearly, there is no standard contract that describes every relationship between a client and contractor: different projects ask for different relationships. On the one hand, there are smaller projects that suffice with a straight-forward relationship, one in which a client expresses his requirements and chooses a contractor that can meet these requirements. On the other hand, the ever-increasing complexity of society and problems asks for more knowledge and expertise, and thus requires stronger and more reliable relationships between clients and contractors (Van de Rijt & Witteveen, 2021). In theory, these different needs can be gathered and generalised in a framework, in which different contract models are distinguished based on their characteristics. Such a framework can be used to choose a contract model suitable for a specific project (Vitasek et al., 2016). The question then remains: can cooperation between a client and a contractor be captured in a framework?

1.1 RESEARCH CONTEXT

Contracts are applied across a wide range of sectors, but this research specifically focuses on those contracts made between clients and contractors operating in the construction industry. Traditionally, these contracts are classified into either transactional contracts, where the client outsources his work to the market, or into investment contracts, where the activities are insourced and the work is performed in-house. Recent developments in the procurement process show the emergence of hybrid contracts that fall within the spectrum of transactional and investment contracts. These hybrid contracts received the term of 'relational contracts', indicating a higher degree of cooperation between the client and the contractor to achieve the project's objectives. Literature in the past decades has explored this phenomenon of relational contracting in an attempt to define its characteristics. The literature that will serve as inspiration for this study is the research that was done by Vitasek et al. (2016), in which a framework is proposed based on the Sourcing Business Model theory. This framework features seven business models ranging from transactional to relational and investment models, applicable in many disciplines. The studies that have been conducted about relational contracting in the construction industry has not explored the application of such a framework in this discipline, and this research aims to fill the knowledge gap. This becomes relevant especially in complex and innovative projects, where the cooperation between a client and a contractor is a determining factor in the achievement of the project objectives.

1.2 RESEARCH AIM

The motivation for this research was proposed by Witteveen+Bos (hereafter also abbreviated as W+B), an engineering and consultancy company in the discipline of Civil Engineering. W+B advises clients (typically governmental bodies or businesses) in finding solutions for problems within four areas of expertise, split into the business lines of 'Built Environment', 'Deltas, Coasts and Rivers', 'Energy, Water and Environment', and 'Infrastructure and Mobility'. Tasks such as technical designs and project management are executed, but the task that is most closely related to this research is their supporting and advising role in the preparation of the procurement process. Their focus here is mainly on larger, long-term projects, where cooperation between a client and contractor is inevitable. The design and management of these contracts are being executed by the business unit (in Dutch: product-

marktcombinatie, PMC) of relational contracting, a sector within the business line of 'Infrastructure and Mobility'.

1.2.1 Problem statement

During the preparation of the procurement process, Witteveen+Bos has found that the involved parties usually try to establish a contract that mostly serves their own interest, instead of compromising in favour of the relationship between the parties (Pots, 2023). Linking this to the Sourcing Business Model theory results in a contract that has characteristics from multiple models rather than strictly following those from one model. This phenomenon of 'cherry-picking' between the different models is not recommended in literature and is said to inevitably lead to problems (Van de Rijt & Witteveen, 2021). This research therefore aims to apply this theory to the construction industry and find out to what degree characteristics of one Sourcing Business Model are followed in contracts, and what effect this has on the cooperation between client and contractor and the achievement of the project's objectives.

1.2.2 Relevance

For the company, Witteveen+Bos, this research gives insight into the effect of their current practices and how these can be improved. The process of writing a contract includes accounting for different, potentially conflicting, interests of client and contractor and W+B plays an important role in aligning these interests in such a way that the best outcome for the project itself is ensured. An objective analysis of both client's and contractor's perspective on the cooperation can give insight into the successful and unsuccessful implications of a contract, which can subsequently serve as useful lessons for future projects. Besides, the application of the SBM framework in procurement processes as supported by W+B will be analysed, supplemented with a proposal for implementation in their current practice.

In a scientific context, this research contributes to the vast body of knowledge that already exists about contracts and their influence on project performance. This existing knowledge will serve as a strong basis for this research project, but the novelty of this study lies in its focus on the 'bouwteam'-phase, which is, as of yet, an emerging approach to cooperation within a project. The results can serve as inspiration for further research into this type of contract, possibly even beyond the national context.

1.2.3 Scope of the research

Because relational contracting is a very broad and widely applicable topic, the scope and boundaries of the research need to be clearly indicated and are presented in the following list:

1. (Relational) contracts are used within a wide range of sectors, but this research only focuses on those in the construction industry (within the disciplines of Witteveen+Bos).
2. Even though the procurement process itself might have influence on the relationship between client and contractor, this process is not in the scope of this research.
3. Only projects under two-phase contracts will be analysed. These contracts are split into a design phase ('bouwteamfase') and an execution phase, but only the first (design) phase is of interest when studying the contract's influence on cooperation and achievement of the project's objectives.
4. The limited timeframe of this study only allows for three case studies to be analysed, which limits the validity and generalisability of the conclusion.
5. The different projects that will serve as case studies will be in different phases of execution, which means that there might be issues that will only be discovered in a later stage of the project. For the same reason, potential cost and time overruns cannot be investigated.
6. Due to the limited time, only clients and main contractors will be interviewed. Interviewing third parties is beyond the scope of this research.

1.2.4 Research objectives and questions

This research compares a theory suggesting which combination of agreements should be included in a contract with a practical application for different projects and their associated contracts. The purpose

of the bachelor thesis assignment is to bridge the gap between theory and practice, and test the statements made in literature (cooperation between client and contractor will be more successful with a strong adherence to one Sourcing Business Model) against the findings of three practice cases. This can be neatly summarised in the following manner:

"**The research objective** is to analyse how the agreements made in a contract influence the achievement of the project objectives and how the SBM framework can be implemented by Witteveen+Bos in the preparation of the procurement process within the Dutch construction industry by identifying the influence of the contract's adherence to one Sourcing Business Model on the success of the cooperation between the client and the contractor."

The main research question that follows from this objective can be formulated as follows:

Main research question: considering the application of the Sourcing Business Model theory, how do choices made in the contract characteristics influence the cooperation between the client and the contractor and thus the achievement of the project objectives?

Two research questions are introduced that aim in answering this main question. The first research question with its accompanying subquestions will be answered for each of the individual projects. Subsequently, the results of the three case studies will be gathered and compared to literature to answer the second research question. When these questions have answered the main research question, the research objective has logically been fulfilled.

Research Question 1: In what sense do the contract characteristics of individual case studies contribute to the intended cooperation between client and contractor and subsequently to the achievement of these projects' objectives?
Which will be answered by:

- **Subquestion 1.1**: What characterises the contract in terms of business model, scope of the work, performance management, pricing, and governance?
- **Subquestion 1.2:** Which project objectives were set at the start of the project?
- **Subquestion 1.3:** What was the intended degree of cooperation within this project?
- **Subquestion 1.4:** How is the cooperation between client and contractor influenced by the choices made in the contract characteristics, as found in RQ 1.1?
- **Subquestion 1.5:** What degree of adherence to one Sourcing Business Model is required to achieve the cooperation goals and thus the project objectives?

Research Question 2: How can the SBM framework be applied during the preparation of the procurement process in the Dutch construction industry?
Which will be answered by:

- **Subquestion 2.1:** Which conclusions can be drawn from comparing the similarities between the findings in literature and the findings in case studies about the relationship between the adherence to one Sourcing Business Model and the achievement of the project objectives?
- **Subquestion 2.2:** Which conclusions can be drawn from comparing the differences between the findings in literature and the findings in case studies about the relationship between the adherence to one Sourcing Business Model and the achievement of the project objectives?

1.3 Methodology

A stepwise approach that was used to answer all the research questions is visualised in Figure 1. Two processes can be distinguished: one for research question 1, the steps of which are followed for all three case studies, and one for research question 2, where the results from the first research question are collected and compared to literature. The remainder of this section will elaborate on the steps as visualised in Figure 1.

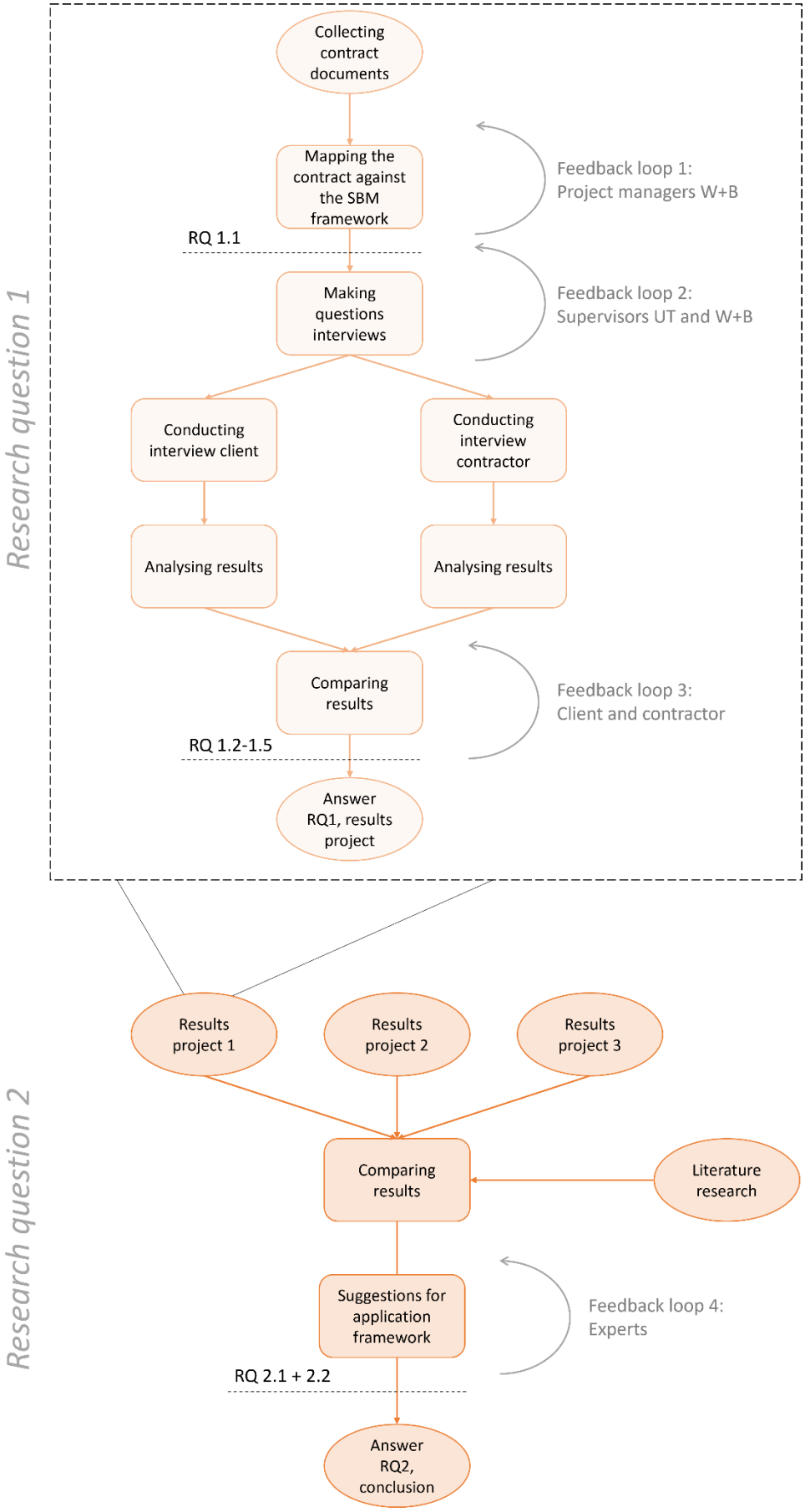


Figure 1 - Stepwise approach to answering research question 1 and 2

1.3.1 LITERATURE RESEARCH

To create a strong base for the main body of this research, the current state of knowledge was explored as a first step. The areas of relevance are the position of relational contracting within the construction industry and the influence of a contract on the relationship between client and contractor. The knowledge gap, which is the application of the Sourcing Business Model theory to the contents of a contract and its influence on the cooperation between the involved parties, has been turned into the object of research.

1.3.2 CASE STUDIES

Three different projects within the construction industry serve as case studies to test the application of the theory in practice. These contracts all follow the two-phase approach and feature a high level of cooperation between client and contractor. Hence, these are most suitable when analysing the influence of the contract characteristics on the cooperation. In all three projects, the bouwteam-phase, or first phase, has been completed and the execution phase is currently in progress. The projects that are analysed are the following:

- Renovation of the Eerste Heinenoordtunnel (EHT) with the development of the 3BT-bouwblok;
- The redevelopment of the Nieuwezijds Voorburgwal Noord (DNZN);
- The replacement of the moveable span in the Nelson Mandelabrug (NMB).

To answer subquestion 1.1, a desktop study was done to map the contracts specified to the bouwteam-phase (often called the 'bouwteamovereenkomst' or 'faseovereenkomst') against the SBM framework. The results of this desktop study served as input for answering the remaining research questions.

1.3.3 INTERVIEWS

Interviews are being conducted to obtain further insight in the practical implementation of the contracts, hereby providing answers to subquestions 1.2 until 1.5. Both the client and the contractor of each project have been interviewed, where the representatives of the respective parties have the role of either project manager or contract manager. The interviews lasted around 1.5 to 2 hours and were recorded, to then be transcribed. The transcription method used is an intelligent verbatim transcription, meaning that every word is written down with some fixations to improve readability. These transcriptions are attached in Appendix 5 as a separate and confidential document, together with an analysis of the similarities and differences between the statements of the client and the contractor. An overview of the interviews that were conducted can be found in Table 1.

Table 1 - Overview conducted interviews

Reference	Project	Organisation, client/contractor	Date
Interview 1 (IN1)	Eerste Heinenoordtunnel	Rijkswaterstaat, client	May 10th, 2023
Interview 2 (IN2)	Eerste Heinenoordtunnel	Dura Vermeer, contractor	May 11th, 2023
Interview 3 (IN3)	De Nieuwe Zijde Noord	Gemeente Amsterdam, client	June 19th, 2023
Interview 4 (IN4)	De Nieuwe Zijde Noord	KWS, contractor	June 5th, 2023
Interview 5 (IN5)	Nelson Mandelabrug	Gemeente Utrecht, client	May 25th, 2023
Interview 6 (IN6)	Nelson Mandelabrug	Contractor	June 9th, 2023

Because of the different agreements made in the projects' contracts, the focus of the questions was not on similar topics. There are, however, four themes that served as the backbone of each interview:

Theme 1. **Project objectives and intended cooperation:** how are the project objectives defined and what degree of cooperation was intended to achieve these objectives?

Theme 2. **Type of contract:** why did the client choose for a two-phase contract or bouwteam-phase and was a different type of contract possible?

Theme 3. **SBM framework:** why did the client choose to design the contract the way it is and did these choices influence the cooperation between parties?

Theme 4. **Discussion points:** did any other discussions arise that can be related to the way the contract is designed?

1.3.4 Comparison between case studies and literature

Research question 2 has the aim to compare the results of the six interviews and find common themes between the three case studies. The findings of this cross-case study were compared to the statement made in literature, namely that 'a strong adherence to one model in the SBM framework is inevitable to ensure a successful project outcome', to then be either confirmed or rejected. The outcome of this comparison revealed the applicability of the SBM framework when targeted to the construction industry and proposed an approach for implementation of such a framework in the preparation of the procurement process as supported by W+B.

1.3.5 Feedback loops

As can be seen in Figure 1, four feedback loops can be distinguished during the process of answering the research questions. These feedback loops served as moments to reflect on the conclusions that had been drawn and to improve the approach for the next project, in case of feedback loop 1-3. The feedback was given either in a meeting or through e-mail, whichever method was most suitable. The feedback loops are the following:

1. After mapping a contract against the SBM framework, the respective project manager or contract manager within Witteveen+Bos who was closely involved with the project was asked to verify whether he thought the characteristics of the contract corresponded to the categories in the SBM framework.
2. After the initial interview questions were drafted, both the internal and external supervisor reflected on them to assess whether they targeted the right topic. Additionally, a practice interview was scheduled to see if there was a natural flow in the order of the questions.
3. After the interviews were conducted, processed, analysed, and compared, the results of the comparison were sent to both the client and the contractor to verify whether no false conclusions were drawn.
4. The proposed application of the SBM framework in the construction industry will be validated by the authors of the book 'Relationele contracten' (2021), Jeroen van de Rijt and Wiebe Witteveen. These are independent experts, having explored the phenomenon of relational contracting and the SBM framework in depth for various disciplines. The findings in this report will be compared to their experience in application of the SBM framework. By the time of writing, this interview still needs to be conducted.

The aim of these feedback loops is to validate the scientific nature of this research.

1.4 Reading guide

To provide the reader with the relevant background information, this research starts with a literature review about the nature of contracts in general and the current way of contracting in the (Dutch) construction industry. The three case studies are then introduced and analysed, before combining the results of the individual case studies in a cross-case analysis. This analysis is then followed by a discussion, featuring an interpretation of the cross-case study and suggestions for further results, and will finally lead to the conclusion.

2 LITERATURE REVIEW

Before diving into the world of relational contracting in the Dutch construction industry, the necessary background information needs to be provided for proper understanding of the various forms of agreements made between parties. This chapter will elaborate on the rise of relational contracting as a general theme, which will then be narrowed to the (Dutch) construction industry. The definition of a contract that will be referred to this section is as follows:

> *[A contract is] "a legal document that states and explains a formal agreement between two different people of groups, or the agreement itself" (Cambridge Dictionary, n.d.)*

2.1 CATEGORISING CONTRACTS

Back in 1963, groundbreaking research was published by Stewart Macauley in which he questioned the added value of a contract. In this research, he stated that it was often the personal relations between parties that replaced the functions of a contract. Informal incentives and peer pressure motivated parties to keep their agreements, instead of potential legal sanctions. Why companies would then still use contracts was, according to Macauley, solely due to the fact that they used them as a form of communication about the product or service that needed to be delivered (Macaulay, 1963). The realisation that contracts did not serve as purely legal instruments served as an inspiration for the research of Ian Macneil, who explored the characteristics of relational contracts in comparison to more discrete (transactional) contracts. In his research, he touched upon the fact that within the spectrum of transactional and relational contracts, there is a whole range of agreements possible between two parties (Macneil, 1987).

Nowadays, different types of contracts can be distinguished that can roughly be divided into three main categories: transactional, relational and investment contracts. To understand the difference between these categories, the work of Oliver Williamson needs to be referred to: in one of his papers, he argues that "as bilateral dependency builds up, the efficient governance of contractual relations progressively moves from simple market exchange to hybrid contracting to hierarchy" (Williamson, 2008). He hereby opposes the idea of a distinct 'make-or-buy' principle (make the product yourself or buy it on the market), but suggests considering it as a continuum, where the so-called 'simple market exchange' corresponds to the 'buy' decision, the 'hierarchy' corresponds to the 'make' decision and the 'hybrid contracting' corresponds to everything that lies in between.

With this in mind, different types of contracts can be distributed across the continuum. On the one hand, there are the transactional contracts that fall into Williamson's market-category – these are the contracts where the demand of the client is outsourced to the market. On the other hand, there are the investment contracts that fall into Williamson's hierarchy-category – these contracts are mainly focused on insourcing activities and performing tasks in-house. In between these extremes, the realm of relational contracting can be found (Vitasek et al., 2016).

2.2 THE SEVEN SOURCING BUSINESS MODELS

There are numerous ways to categorise different types of contracts, but the framework that will serve as a basis for this research is the seven Sourcing Business Models framework as proposed by Vitasek et al. (2016). This framework has been shortly introduced in the introduction but requires further explanation to enable application in this research.

The research of Vitasek et al. (2016) found that many organisations still operate under conventional transaction-based models (IACCM, 2010, via Vitasek et al., 2016), but that there is a growing awareness that these models do not always give the intended results. There is an increasing interest in other business models, including output and outcome-based approaches. This resulted in a framework that was based on Williamson's market-hierarchy continuum, featuring seven Sourcing Business Models that are either transactional, relational, or investment-based (see Figure 2).

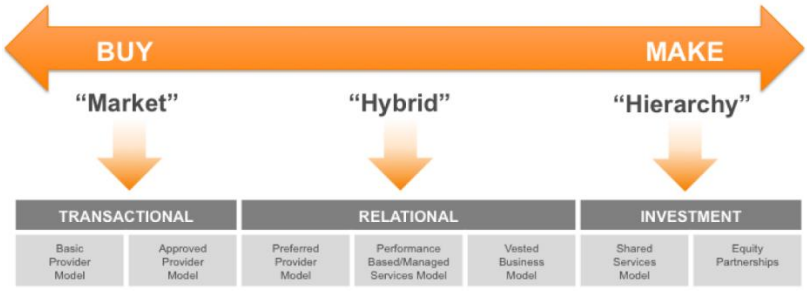


Figure 2 - The seven Sourcing Business Models reflected on Williamson's continuum (Vitasek et al., 2016)

Every Sourcing Business Model has a certain set of characteristics that are built upon five rules, serving as the purpose of every relation. These rules are very general and apply to many disciplines. How they apply to the construction industry specifically will be explained further in this chapter, but the general rules are the following:

- Business model (what does the economical model look like, how can the relationship between parties be described and what is the vision/intention of the business model?);
- Scope of the work (how is the Statement of Work designed and what is the goal of every party? Is the client focused on how the contractor delivers his work, what he delivers or what the effect of his work is?);
- Performance management (which type of performance is expected and how is this being measured: a Key Performance Indicator (KPI) on how the job has been done, on service level or on the outcome?);
- Pricing (is the work of the contractor priced per activity, for the performance, or for achieving the desired effects? Does the client work with incentives and penalties?);
- Governance (how are relations governed, is there a potential for improvement and innovation, how is exit management designed, and how can compliance be assured?).

An elaboration on these rules and how the characteristics change over the spectrum from transactional to relational contracts will be given in the remainder of this chapter.

Based on this set of rules, the seven Sourcing Business Models can be distinguished from each other. A complete overview of this framework can be seen in Table 2, with a short description per rule of the characteristics of the individual models. Vitasek et al. (2016) distinguish the following models (ranging from transactional to relational):

- Basic provider model (transactional);
- Approved provider model (transactional);
- Preferred provider model (relational);
- Performance based/managed services model (relational);
- Outcome-based/Vested business model (relational);
- Shared services model (investment);
- Equity partnership model (investment).

The elaborate explanation and characteristics of every model can be found in Appendix 1, whereas the relevant models for this research and their role in the construction industry can be found in Section 2.3 and 2.4. Note that the framework of Table 2 combines the two investment models (Shared Services Model and Equity Partnership Model), as a result of their overlap. This framework will be referred to as the 'SBM framework' in the remainder of the report.

Table 2 - SBM framework (Vitasek et al., 2016)

		TRANSACTIONAL (MARKET)		RELATIONAL (HYBRID)			INVESTMENT (HIERARCHY)
		BASIC PROVIDER	APPROVED PROVIDER	PREFERRED PROVIDER	PERFORMANCE-BASED/MANAGED SERVICES	VESTED	INVESTMENT (EQUITY PARTNER/ SHARED SERVICES)
BUSINESS MODEL							
Business Model	Economic Model	Transaction Based (per Transaction, Hour or Unit)	Transaction Based (per Transaction, Hour or Unit)	Transaction Based (per activity, hour or unit)	Output Based	Outcome Based	Transactional, Output or Outcome Based
Business Model	Relationship Model	Transactional/ no relationship	Transactional/ Supplier Vetted on "Approved" List	Relational Contract– Emerging Collaboration	Relational Contract– Collaborative	Relational Contract– Highly Collaborative	Investment Based
Vision & Intent		Supply at Lowest Cost	Recurring Commodities at Fair or Lowest Costs	Value Added Capabilities at Best Value	Performance to SLA– Process Efficiencies	Shared Vision, Desired Outcomes & Value Creation	Sustainable Value
SCOPE OF WORK							
Statement of Work & Objectives		"Who" and/or "How"	"Who" and/or "How"	"Who" and/or "How" with Jointly Defined "How"	"What" Limited Emphasis on "How"	"What"	"What if", "What for" and "When"
PERFORMANCE MANAGEMENT							
Performance Focus		Simple Three Way Accounting Match	PO Requirements	Activity Based Service Level Agreements	Output Based Service Level Agreements	Strategic Desired Outcomes	P&L Based Measures
Performance Measures		Right Quantity, Right Price, Damage Free	Basic Provider Metrics + Increased Quality Emphasis	Operational + Customer Satisfaction	Operational + Relational (Values & Behaviors)	Operational + Transformational + Relational System Wide KPIs	Joint Measures of Success
PRICING							
Pricing Model & Incentives		Fixed Price/Typically No Incentives/Volume Rebates	Fixed Price/Low No Incentives/Volume Rebates	Fixed Price/Low Incentives/Volume Rebates	Price with Incentives and/or Penalties	Pricing Model with Value Based Incentives	P&L Based Equity Sharing
GOVERNANCE							
Relationship Management		Delivery & Pricing Validation (Three Way PO Match)	Some Performance & Pricing Oversight	Limited Supplier Relationship Management	Oversight Emphasis: Supplier Relationship Management	Insight Emphasis: Strategic Relationship Management	Shared Control and Management
Improve, Transform, & Innovate		None/Market Driven	Limited/Market Driven	Beginning to Focus on Incremental Improvement	Supplier Driven to Meet SLAs/Price Glide Path	Joint & Proactive Transformation Management	Core Innovation Capabilities
Exit Management		One Way/Limited Commitment to Buy	One Way/Termination for Cause & Convenience	One Way/Termination for Cause & Convenience	Perf Based Termination for Cause w/Safeguards	Joint Exit Management Plan	Divestiture
Compliance & Special Concerns		Compliance Driven/ Survey Based	Typically Compliance Driven/ Survey Based	Typically Market Based/Minimum Audit Requirements	Corporate Based Audit Requirements	Outcome Based Joint Requirements	Investment Based Joint Requirements

2.3 Elaboration of the SBM framework

As mentioned earlier, this section will briefly elaborate on the separate characteristics that the SBM framework uses to distinguish the seven contract models, targeted to the construction industry. Note that this explanation does not include the characteristics of the investment models, since these are beyond the scope of the research.

2.3.1 Business Model – Economic Model

The economic model describes the focus of the client in the project: this can be either on transactions (i.e., the activities and tasks the contractor is working on) or can take on a wider approach. This wider approach is either on the result (output) of the project itself, or even on larger scale, where the consequences and impacts of the project on its environment are also considered (outcome-based). The more relational the contract gets, the larger the focus of the client becomes.

2.3.2 Business Model – Relationship Model

The transactional models are mainly focused on a very discrete relationship between client and contractor. There is a culture in which the contract is being 'thrown over the fence', meaning that the

client writes the contract without consulting the contractor and providing him with the tasks that he is supposed to do without much room for collaboration.

The more relational contracts (performance-based and Vested) do allow for this collaboration and feature an Early Contractor Involvement (ECI). The main advantage is that the contractor can use his expertise here to advise and warn the client about complexities and the feasibility of the project. The models distinguish themselves with the varying degree of collaboration, where the Vested model fully embraces the 'What is in it for We (WIIFWe)'-mindset, whilst the performance-based model only focuses on the aim of achieving a better result of the project.

2.3.3 Business Model – Vision & Intent

The main goal of a client to sign a transactional contract is to get the work delivered for the lowest price. This emphasis on price is still reflected in the Best Value approach (preferred provider model), but also considers the quality that can be delivered for this price. When shifting towards the relational side of the spectrum, the quality of the work becomes even more important, and the emphasis on the price decreases. For a performance-based model, this means that the client demands a certain performance from the contractor, whilst for the Vested model, client and contractor establish a mutual vision and strategic outcomes that benefit both parties.

2.3.4 Scope of Work – Statement of Work & Objectives

The Scope of Work features one of the biggest distinctions between transactional contracts and relational contracts. In purely transactional models, the client determines exactly what needs to be done, how this needs to be executed and based on who is the most capable bidder, he chooses the contractor he wants to collaborate with. However, as soon as the complexity of the projects increases, a client cannot oversee the activities and corresponding risks and needs the expertise of the contractor to prevent contingencies from happening. This is reflected in the preferred provider model with a jointly defined 'how': the client still determines the output, but the contractor has a say in how he thinks this is achieved most efficiently.

Moving more towards the right of the spectrum, a lesser involvement of the client in the definition of 'how' can be seen. The client only defines what he ultimately wants from the project, and lets the contractor decide on the specific requirements and how they are met. This corresponds to the thought of 'we hired the expert; we need to let them be the expert'.

2.3.5 Performance Management – Performance Focus

Whereas performance management in the transactional models is mainly focused on the predefined requirements that contractor needs to fulfil, this focus shifts more towards output-oriented measures as soon as you move to the relational models. The performance focus very much depends on the economic model and scope of work that is chosen for the project: if a clearly defined list of activities for the contractor has already been prescribed, the performance focus will very likely be on these activities. If, however, the client only defined the outputs or even the desired outcomes, the focus of the performance will be on these aspects.

2.3.6 Performance Management – Performance Measures

With a performance focus solely on transactions, the measures are naturally aimed at these activities as well. When the relationship between the two parties grows stronger, however, one would likely want to measure (the result of) this cooperation as well, either based on customer satisfaction or on the relationship itself. Similarly, a larger focus on transformation in the Vested model requires this to be measured, to ensure continuous improvements.

2.3.7 Pricing – Pricing Model & Incentives

Traditionally, clients would pay the contractor a fixed price, corresponding to the bid of the contractor. A prespecified list of tasks can easily be monetised, but when these are not specified and the two parties need to collaborate, contractors are usually paid in spent hours. Incentives and/or penalties can be used to motivate contractors to deliver faster.

In the Vested model, the pricing model is designed such that both risk and reward are shared. The responsibilities are distributed between the client and the contractor and incentives are always included, aimed on transformation and innovation in the value chain.

2.3.8 Governance – Relationship Management

Relationship management describes the collaboration between the client and the contractor and their respective roles. In the transactional models, but also in the preferred provider model, there is a limited relationship between the two parties with a clear division of responsibilities. This division becomes ambiguous in a performance-based model, which is reflected in contractors taking over clients' tasks and vice versa, or both parties cooperating on one task. In a Vested model, this cooperation is taken to a strategic level where both parties share the same vision, including financial implications. The relationship now brings competitive advantages for both.

2.3.9 Governance – Improve, Transform & Innovate

The focus on innovation is very limited in transactional contracts and, if included, are purely market driven. The first notorious improvements can be seen in the preferred-provider model, where the client has expressed a desire for innovation and chooses a contractor that can implement this.

In the performance-based model, the client is in a more leading role and determines the degree of innovation itself to be implemented by the contractor. However, the highest focus on improvement and transformation is found in the Vested models, where client and contractor cooperate to stimulate, develop, and implement innovation and transformations.

2.3.10 Governance – Exit Management

In case one of the parties does not live up to the agreements that were established, the other party can always decide to terminate the contract. However, when the client and the contractor have put significant effort in establishing a relationship, which is the case in relational contracts, the contract can contain a clause that requires the parties to find a solution collaboratively before terminating the contract definitely. In the Vested model, this shapes itself in the form of a distinct exit management strategy, that prevents unnecessary harm for either of the parties involved.

2.3.11 Governance – Compliance & Special Concerns

The final category refers to the requirements that the contractor needs to comply to. These are typically market-based requirements in investment contracts, but as the project grows more complex (and requires a stronger relationship), so do the requirements needed to successfully deliver the project. Performance-based models typically have more specific compliance requirements, based on the project specifics. In a Vested model, these requirements are determined jointly, and innovation is more often featured in them.

2.4 Contracts in the construction industry

The theory behind the SBM framework applies to a wide range of sectors, one of which is construction industry where the use of contracts is inevitable. The two main players in this industry are called 'the client' (the party that has the desire to have a work constructed, or a service delivered) and 'the contractor' (the party that executes the work). This section will focus specifically on the developments in the construction industry concerning the contracts that are written between these two players.

2.4.1 The rise of relational contracting

The construction industry is known for its multidisciplinary nature, which brings along an extra dimension of complexity. All the different interests of stakeholders cause a high uncertainty in projects (in terms of expectations and requirements), thus requiring a high level of trust between participants (Rowlinson & Cheung, 2004). Besides, research has found that with an increasing complexity of projects, the chance of failure increases as well (Luo et al., 2017). The solution to decrease this chance and create a higher level of trust between parties is a better collaboration between those involved in

the project (Ke et al., n.d.). Naturally, relational contracting seems to be an effective approach to achieve these objectives.

Traditionally, clients would keep their contractors at arm's length, resulting in a culture where contractors focus on the short-term prospective and try to increase their profits whenever possible. This brought along other problems, such as low levels of trust, a competitive and conflict-ridden atmosphere, broken promises, opportunistic behaviour, and misuse of power to control the other party, amongst others (Nwajei, 2021). A typical example of such transactional contracts is the Design-Bid-Build contract (DBB), where the design of the work was done by the client without any relation to the contractor who would execute the work (Hosseini et al., 2017). However, it was found that more involvement of the contractor and a focus on a long-term relationship encourages the contractor to deliver adequate quality and build trust in the relationship, rather than behaving opportunistic (Rowlinson & Cheung, 2004). Involving the contractor in an early stage of the project and prioritising the collaboration between parties gives room for the many advantages, such as using the combined expertise in risk and uncertainty management, for providing insight on innovation opportunities and for giving a sound reality check (Walker & Lloyd-Walker, 2012).

However, this cooperative relationship between client and contractor seems to be, more often than not, a utopia that is harder to achieve than expected. Research found that clients tend to preserve old behaviours in their procurement choices, resulting in competitive procurement choices being more common than cooperative ones. This is reflected in a greater focus on so-called 'output control' (control on the results, often measured with price), instead of a more desired 'social control' (focusing on trust, minimizing divergence in preferences and understanding each other's behaviour) (Eriksson, 2008). This form of control can nurture opportunistic behaviours on both sides, whilst this is precisely the type of behaviour that is tried to be avoided by emphasizing relational governance such as trust (Wang et al., 2022).

2.4.2 Common contracting types in the Netherlands

At the beginning of the century, the Dutch construction industry was mainly operating in a competitive environment, featuring distant relationships and a focus on low-cost selection. The client would make a design with consulting an engineering company, before handing it over to the contractor and telling him exactly how to execute the project (example of this is a DBB contract, in the Netherlands commonly known under the name of 'RAW-bestek'). Especially with larger projects, this approach proved to be problematic without proper communication and alignment of expectations between parties (Boes & Dorée, 2013). For this reason, knowledge institute CROW established the Uniform Administrative Conditions for Integrated Contracts (UAC-IC, in Dutch: UAV-GC, Uniforme Administratieve Voorwaarden voor Geïntegreerde Contracten) (CROW, 2005). These conditions form a guideline for organisations to base their contract on and focus specifically on the early involvement of the contractor in the design phase. One of the most notorious integrated contract forms is Design & Construct (D&C), where the client formulates a Programme of Requirements and the contractor is responsible for the preliminary design and final design, before he continues with the execution phase (Van der Spek, 2012). Within the SBM framework, D&C contracts typically fall within the performance-based model (Van de Rijt & Witteveen, 2021).

However, the increasing complexity of projects demands for a closer cooperation between client and contractor. For such projects, so-called 'two-phase contracts' (in Dutch: tweefasencontract) were introduced. The main idea behind these two-phase contracts is the clear distinction between the design phase and the execution phase. A structure that is often seen in the design phase is the 'construction design team' (in Dutch: bouwteam) where the client, the contractor, and occasionally the engineering/consultancy company combine forces to create a design. The biggest advantages of this structure are that all parties can implement their expertise into the design in an early stage of the project, and that there is less misunderstanding of information between the client and the executing organisation. A general timeline of such an approach can be seen in Figure 3. This figure shows that

two-phase contracts require two different contracts: one for the design phase (following certain conditions, such as those written down in DNR (= De Nieuwe Regeling) or ARVODI-2018 (= Algemene Rijksinkoopvoorwaarden voor Diensten)) and one for the execution phase (following the guidelines of UAV(-GC), as described earlier) (Hoevink, n.d.). Even though the bouwteams are more relational compared to the D&C contracts, the two-phase contracts cannot be regarded as Vested models. Even though the bouwteam-phase is very much leaning towards the right side of the SBM-framework, the execution phase usually follows a traditional, transactional model, which leaves the two-phase contracts to end up around the preferred-provider model (Van de Rijt & Witteveen, 2021).

Figure 3 - Example of a two-phase contract with a construction design team (bouwteam)

There is a rise, however, of pilot projects following contracts that adapt most of the Vested model's characteristics. An example of one of these pilot projects is the 'Project DOEN' as launched by Rijkswaterstaat. Cooperation between the involved parties is a crucial element of these projects, to achieve maximum value for the client(s) and end users, and to deliver fair work for fair money. All parties work together to achieve a shared vision and all agreements are made in consultation with the involved parties, instead of this being one-way traffic; on top of this, risks and responsibilities are shared between the various participants. This approach is now being adopted for smaller, less complex projects with sufficient resources available, before they can be applied to larger projects. (Projectteam DOEN, 2013)

One contract form that will briefly be touched upon is strategic alliancing, which distinguishes itself from the previously mentioned contract forms by the fact that client and contractor merge in such a way that they become a separate legal entity, where risk and rewards are shared. Even though there is no consensus in what the definition of 'strategic alliancing' ultimately is (Yeung et al., 2007), the following definition captures much of the important elements of this relation between client and contractor: "A strategic alliance is a cooperation with a duration longer than a project, which has the intention to change the product market competence combinations of the participating partners. These partners share the rewards and risks. They conscientiously create a level of mutual dependence and exclusivity, without losing their independency. Implicit rules of trust and equality apply to the mutual interaction and attitude" (Snijders & Geraedts, 2007). Aspects of this definition are reflected in the key features of alliancing as described by a guide of the State of Victoria about alliance contracting, where features such as 'risk and opportunity sharing', 'transparency' and a 'joint management structure' are mentioned (State of Victoria, 2010). The reason for mentioning the strategic alliances in this report is the many parallels it has with the Vested-model in the SBM-framework: elements like a shared vision, strategic desired outcomes and a shared risk and reward system are featured by both.

Positioning the numerous contract types of the Dutch construction industry within the theory of the SBM framework gives the necessary insights for the remainder of this report. The statement made by Van de Rijt and Witteveen (2021), that contracts should adhere to the characteristics of one Sourcing Business Model only but that the opposite is often done in practice, leading to all sorts of problems, will be tested against three case studies within the Dutch construction industry. With the theoretical knowledge about contract types and the examples of practical implication, the aforementioned statement will either be consolidated or rejected.

3 CASE STUDY 1 – PROJECT 'RENOVATIE EERSTE HEINENOORDTUNNEL EN 3B TUNNELS' (REH3BT)

The first project to be analysed is the renovation and long-term maintenance plan of the so-called 'Eerste Heinenoordtunnel' (abbreviated as EHT), with the additional task of developing a general system for operating, monitoring, and managing this tunnel and future tunnels (the so-called 3BT-bouwblok: 'Bediening, Besturing en Bewaking Tunnel'). In its entirety, the project is abbreviated as REHT3BT, short for the Renovation of the Eerste HeinenoordTunnel and the development of the 3BT system. This chapter will give background information about the project itself, followed by an analysis of the relevant contract documents and a qualitative assessment of the cooperation between client and contractor. This desktop study is followed by a section describing the results from the interviews with the client and contractor of this project.

3.1 PROJECT DESCRIPTION

This project is issued by Rijkswaterstaat (abbreviated as RWS) and is part of their programme 'Replacement and Renovation' ('Vervanging en Renovatie', V&R). This programme is meant for multiple tunnels and bridges in the region West-Nederland Zuid (WNZ) that are built in the period around 1950/1960 and are due for either replacement or renovation. The EHT will be the first tunnel in the programme to be renovated, with the aim to require no major maintenance in the next 30 years, and no replacement of technical installations in the next 15 years. Besides the renovation of the tunnel, a general system will be developed (the 3BT-bouwblok) that, if applied successfully in the EHT, will be used as standardisation in the other tunnels within the programme V&R.

The tunnel is situated on the highway A29, south of Rotterdam and Barendrecht (see Figure 4). It serves as the connection between Rotterdam and the southern islands, with daily traffic of 110,000 cars that use the tunnel to cross the river 'Oude Maas'. The tender for this project was published in January 2020 and the desired deadline for the renovation works is at the end of 2024. The project has three main objectives, being:

- The renovation of the EHT;
- The development of the 3BT-bouwblok;
- The application of the 3BT-bouwblok in the EHT.

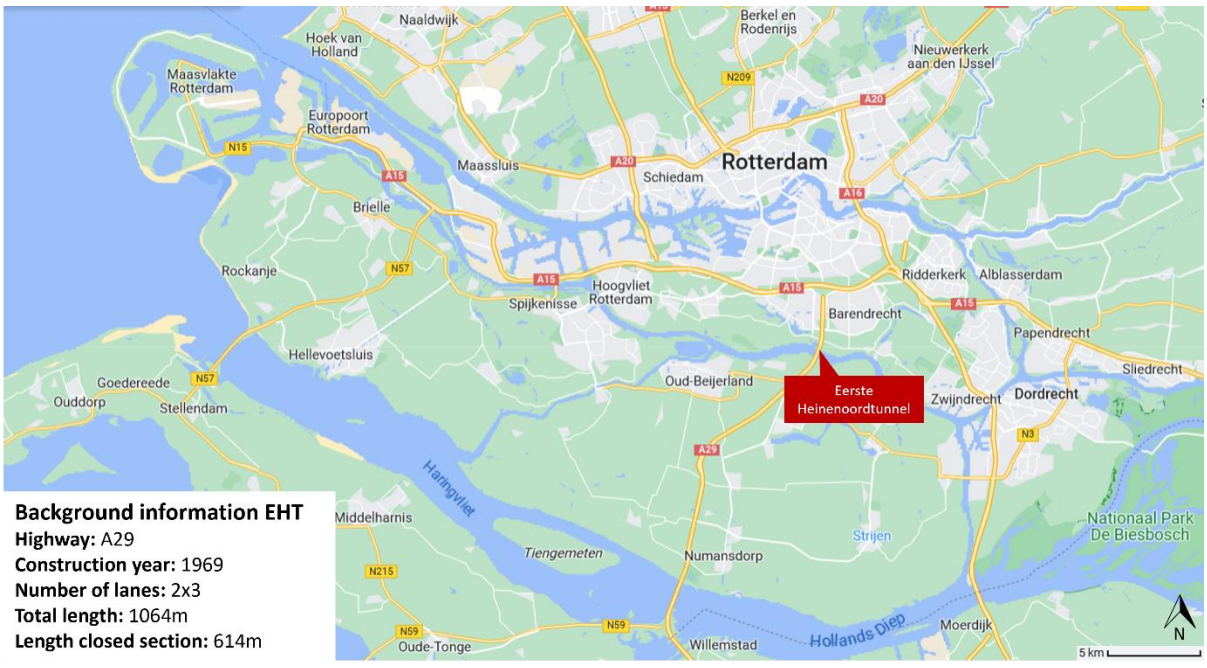


Figure 4 - Location of the EHT

3.2 CONTRACT DESIGN

The structure of the contract is an extensive one, as is shown in Figure 5. Rijkswaterstaat chose for a so-called two-phase contract, hereby separating the design phase ('uitwerkingsfase') and the execution phase ('uitvoeringsfase'). The design phase, or phase 1, features one contract with its appendices, the so-called 'faseovereenkomst' (phase agreement). The second phase is split in the renovation and maintenance of the EHT, which are contracts designed under the conditions of UAV-GC (contract 2), and the development of the 3BT-bouwblok, which is designed under the conditions of ARBIT (contract 3). Contract 2 and contract 3 are coupled with the cooperation agreement ('samenwerkingsovereenkomst', contract 1), which ensures the consistency between the separate smaller projects.

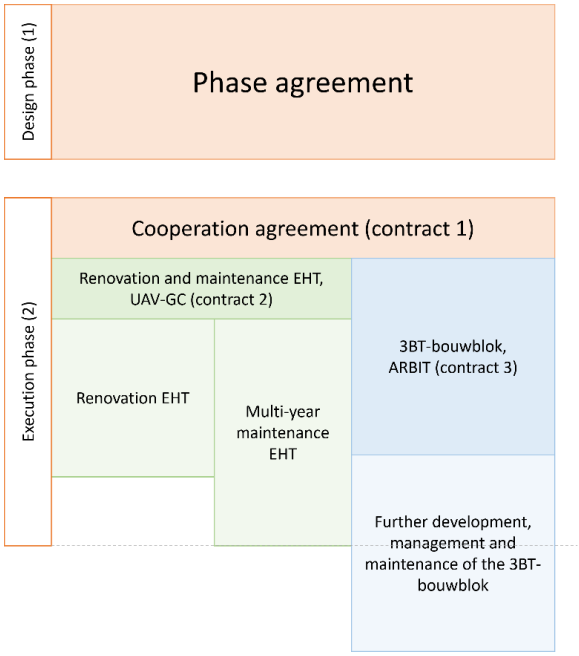


Figure 5 - Visualisation of the contract structure (copied from the 'Faseovereenkomst')

Figure 6 gives a schematic overview of the stages in the project that were covered in the first phase, and the stages that were covered in the second phase. As can be seen, the first phase was mainly meant for the creation of the preliminary design, and the high degree of uncertainty in this phase required a high degree of collaboration.

Figure 6 - Schematic overview of the different phases (EHT)

The contractor that won the bid is called Savera III, which is a partnership between three parties: Dura Vermeer Divisie Infra B.V. (responsible for the design and construction of a new utility tunnel (middentunnelkanaal), repairing the concrete, and asphalting the road surface), Dynniq Nederland B.V. and SPIE Nederland B.V. (responsible for the design and maintenance of the technical installations within the tunnel). These parties have worked together in the design phase for 9 months to understand the scope of the project and to work towards mutual agreement about the contract for the second phase, in which the works aimed to achieve the three main objectives are executed. This design phase was finished at the beginning of 2021 and will be the focus of this analysis; the execution phase is beyond the scope.

3.3 APPROACH TO COOPERATION

Whenever a client approaches the market for a bid, they publish the Instructions to Tenderers (ITT) ('aanbestedingsleidraad'), including the desired and intended cooperation that client deems necessary to achieve the project objectives. In the ITT, Rijkswaterstaat explicitly expressed the wish to actively involve the contractor in the decision process to create Best Value for the project (an approach based on obtaining most value for the best price). The ITT for this project distinguished two components that contribute to this idea:

- "Eerlijk geld voor eerlijk werk" (fair money for fair work), where a reasonable price is asked for the quality that is delivered;
- "Hoe we samenwerken bepalen we samen" (we determine collaboratively how we work together), meaning that the approach, way of cooperation, type of contract, distribution of risks and price are established with the involvement of both parties.

These statements find their origin in the DOEN-approach and even though this project did not strictly follow this approach, some ideas were implemented to stimulate the cooperation between both parties. With working along the lines of these ideas, Rijkswaterstaat aims to create the mindset in the team that is required to achieve the project objectives and believes that this is how Best Value for the project can be obtained.

The awarding of the bid is done based on so-called BPKV-criteria ('Beste Prijs-Kwaliteit Verhouding', translated into 'best price-quality ratio'): these are defined by the client and correspond to what he thinks are the most important criteria the contractor should adhere to in order to finish the project successfully. The BPKV-criteria in the project REHT3BT are the following:

1. Cooperation in the project (concerning the contractor's approach to cooperation);
2. The contractor's interpretation of the design phase (including a plan of approach, mainly focused on the quote "Eerlijk geld voor eerlijk werk");
3. Control management plan of the project risks (concerning nuisance for the road users, delay in work, delays in granting permits and/or setbacks in the development of the 3BT-bouwblok).

3.4 RESULTS DESKTOP STUDY

The highlighted categories in Table 3 show the characteristics of the contract in the first phase, mapped against the SBM framework. This categorisation is verified by the involved contract manager within W+B and will serve as input for the interviews, where potential discrepancies are discussed and analysed.

The innovative nature of this project (being the development of the 3BT bouwblok) asks for a higher degree in cooperation, which is reflected in the economic model and the relationship management. The other characteristics of the contract, however, do not correspond to those in the Vested model. In the Statement of Work, the client expressed an elaborate list of items that were to be developed, hereby prescribing the 'how' of the work that was to be executed; one of the features of the approved provider model. At the same time the client expressed the wish to work along the Best Value approach and used a fixed price with few penalties, corresponding to the preferred provider model. The remaining categories did not follow one model either – it can thus be concluded that there is a high degree of cherry-picking within this contract. Further elaboration and explanation on the choice of Sourcing Business Model per category can be found in Appendix 2. The remainder of this chapter will focus on the influence these choices had on the cooperation between client and contractor.

Table 3 - Contract of the EHT mapped against the SBM framework

		TRANSACTIONAL (MARKET)		RELATIONAL (HYBRID)			INVESTMENT (HIERARCHY)
		BASIC PROVIDER	APPROVED PROVIDER	PREFERRED PROVIDER	PERFORMANCE-BASED/MANAGED SERVICES	VESTED	INVESTMENT (EQUITY PARTNER/ SHARED SERVICES)
BUSINESS MODEL							
Business Model	Economic Model	Transaction Based (per Transaction, Hour or Unit)	Transaction Based (per Transaction, Hour or Unit)	Transaction Based (per activity, hour or unit)	Output Based	Outcome Based	Transactional, Output or Outcome Based
Business Model	Relationship Model	Transactional/ no relationship	Transactional/ Supplier Vetted on "Approved" List	Relational Contract—Emerging Collaboration	Relational Contract—Collaborative	Relational Contract—Highly Collaborative	Investment Based
Vision & Intent		Supply at Lowest Cost	Recurring Commodities at Fair or Lowest Costs	Value Added Capabilities at Best Value	Performance to SLA—Process Efficiencies	Shared Vision, Desired Outcomes & Value Creation	Sustainable Value
SCOPE OF WORK							
Statement of Work & Objectives		"Who" and/or "How"	"Who" and/or "How"	"Who" and/or "How" with Jointly Defined "How"	"What" Limited Emphasis on "How"	"What"	"What if", "What for" and "When"
PERFORMANCE MANAGEMENT							
Performance Focus		Simple Three Way Accounting Match	PO Requirements	Activity Based Service Level Agreements	Output Based Service Level Agreements	Strategic Desired Outcomes	P&L Based Measures
Performance Measures		Right Quantity, Right Price, Damage Free	Basic Provider Metrics + Increased Quality Emphasis	Operational + Customer Satisfaction	Operational + Relational (Values & Behaviors)	Operational + Transformational + Relational System Wide KPIs	Joint Measures of Success
PRICING							
Pricing Model & Incentives		Fixed Price/Typically No Incentives/Volume Rebates	Fixed Price/Low No Incentives/Volume Rebates	Fixed Price/Low Incentives/Volume Rebates	Price with Incentives and/or Penalties	Pricing Model with Value Based Incentives	P&L Based Equity Sharing
GOVERNANCE							
Relationship Management		Delivery & Pricing Validation (Three Way PO Match)	Some Performance & Pricing Oversight	Limited Supplier Relationship Management	Oversight Emphasis: Supplier Relationship Management	Insight Emphasis: Strategic Relationship Management	Shared Control and Management
Improve, Transform, & Innovate		None/Market Driven	Limited/Market Driven	Beginning to Focus on Incremental Improvement	Supplier Driven to Meet SLAs/Price Glide Path	Joint & Proactive Transformation Management	Core Innovation Capabilities
Exit Management		One Way/Limited Commitment to Buy	One Way/Termination for Cause & Convenience	One Way/Termination for Cause & Convenience	Perf Based Termination for Cause w/Safeguards	Joint Exit Management Plan	Divestiture
Compliance & Special Concerns		Compliance Driven/ Survey Based	Typically Compliance Driven/ Survey Based	Typically Market Based/Minimum Audit Requirements	Corporate Based Audit Requirements	Outcome Based Joint Requirements	Investment Based Joint Requirements

3.5 RESULTS INTERVIEW

To answer the question why the contract was designed as described and how this affected the cooperation between the involved parties, both the client and contractor were interviewed and asked for their perspective on this project. An elaborate overview of the answers given to the questions and how they compare to each other is given in Appendix 5 (separate document).

Both interviews commenced with the question of what the purpose of the project was, and how the goal of the cooperation corresponding to that purpose was intended. These questions quickly clarified that the project initially focused solely on the renovation of the EHT, which is a task that can be done with a traditional, transactional contract. There was, however, a delay in the project of the development of the 3BT-bouwblok which was supposed to be finished before the renovation, and it was decided to combine the development of this bouwblok with the renovation of the tunnel itself. This led to a more complex task, to be completed in a shorter period of time (due to the delay of the 3BT-bouwblok), and thus a different demand for cooperation. Instead of requiring only specific knowledge of the contractor, there was more innovative knowledge required that could not be priced yet, and an opportunity to transfer the responsibilities to the execution phase smoothly was desired. The addition of the

development of the 3BT-bouwblok forced the client to adopt a two-phase approach, in which cooperation with the client was inevitable to exchange knowledge within the limited time available. This can be summarised as:

The goal of the project was to renovate the tunnel by replacing its installations, with the additional task of developing the 3BT-bouwblok, which was to be implemented in this tunnel first.

The goal of the cooperation was to gain complex and innovative knowledge from the contractor in the limited time available, to agree on the price for these tasks, to divide risks and responsibilities between client and contractor and to rightly prepare the transfer of the responsibilities for the development of the 3BT-bouwblok to the contractor in the execution phase.

What thus happened is that the approach of the project is very much focused on cooperation (which is usual in a two-phase approach: cooperation is the crucial factor in the first phase), but the implementation was still very traditional, which comes from the original plan for this project. This is, for instance, translated into the clear definition of the tasks, leaving less freedom for the contractor to use his own knowledge and expertise as input. Both client and contractor were asked how they experienced the influence of certain contractual choices on the cooperation between the two parties, which results will be presented in this section.

3.5.1 Scope of work

Both parties agreed on the fact that the tasks of this project were clearly defined in advance, contrary to what is commonly done in a two-phase approach. The client argued that this was required for this case to guarantee a more efficient exchange of knowledge, which was inevitable in the short amount of time available. The client already possessed 90% of the required information and needed the specific input of the contractor for the remaining 10%. The following quote will clarify the mindset that the client had for this phase:

> *"We gained experience about this topic for decades, which was a good solution. Then why would you ask the market to propose a good solution, anew?"*

The contractor agreed that publishing requirements fits the goal of this project but would have liked to see more freedom in the distribution of the risks. The discrepancy that stood out is found in the fact that the client thinks that a contractor likes to have a clear set of tasks to execute, whereas the contractor emphasizes his desire to cooperate with the client on those tasks.

Interesting to note, however, is that the practical implementation of the contract does not correspond to the literal agreements. Even though the contract prescribes detailed tasks, both client and contractor found that the cooperation between them in the first phase led to the definition of many so-called 'development items' (in Dutch: uitwerkingsitems), tasks that had to be done by either one of the two parties that came up during the bouwteam-phase. They independently argued that this process was more according to the 'performance-based' model, instead of the 'approved provider' model that the contract suggested.

3.5.2 Performance management

Even though the contract mentions the tasks and criteria on which performance was measured, the client stated that this has not been followed as strictly as the contract suggests: they only assessed from time to time whether the contractor met the requirements of the contract. The assessment, based on the so-called BPKV-criteria, contained a section about cooperation, and the client argues that the awareness of cooperation activated a different mindset in the contractor, one that was more focused on cooperation.

The contractor agrees upon the fact that the client did not strictly focus on completing the pre-defined tasks and appreciated the trust that the client had in their work. Additionally, he stated that a very close

management would not have been fair, considering all the development items that were added only later on in the project.

3.5.3 PRICING

Even though the SBM framework suggests the use of incentives and penalties when cooperation between parties grows stronger, both parties agreed that incentives usually have a counterproductive effect: contractors tend to rush work to obtain the bonus, hereby neglecting other important factors such as safety and quality of the work. Moreover, the contractor questioned the use of penalties, hereby arguing that that having delays already has significant negative consequences for them.

The contractor stated that they feel like they can focus more on the quality of the work when the client is less focused on the price exceedances. This was reflected to a certain degree in this project, where both client and contractor felt that the client was willing to pay extra money if the contractor thought this was necessary. These requests for extra money mainly arose from the additional work that had to be done, which was a result of the development items that both client and contractor established. Both parties thought it fair that extra compensation was provided here.

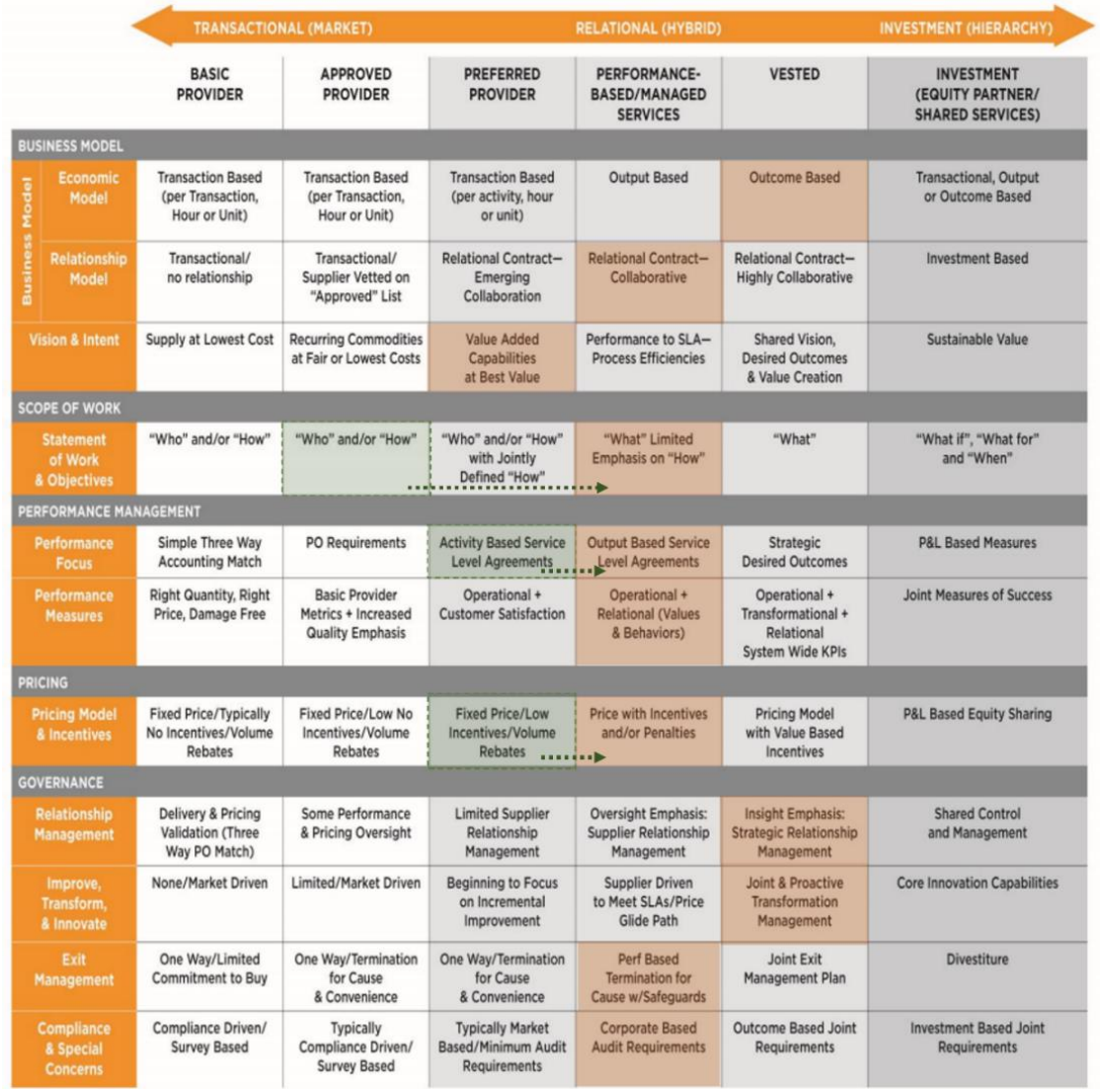
3.6 SUMMARY RESULTS

One of the most notorious things that became clear during the interviews about this project is that even though the contract itself does not particularly adhere to one Sourcing Business Model, practice showed that both parties acted more towards the performance-based model in different categories. Client and contractor used the first phase to cooperatively compose the several development items, which simultaneously resulted in the client not strictly holding on to the seemingly fixed price. Additionally, this meant that the focus on the performance became less strict and was more focused on the output of the project, instead of a narrow focus on the achievement of the predefined tasks. Visualising these shifts results in an implementation of the framework as visualised in Table 4, which shows that the parties naturally acted more according to one model.

One could ask why the characteristics of the performance-based model were not reflected in the contract in the first place. This is thought to be a result from the standardisation within the client's company: they have been using a certain model for years now, which applies to projects over a whole range of different characteristics. These contracts are then customised to fit the individual projects, but the basic characteristics of the contract stay the same. The client sees this as a positive development that benefits the contractor in clarifying what is expected from him, whereas the contractor sees this development as a restriction of his freedom of input.

What did not align between client and contractor were the expectations in the distribution of the risks. The contractor thought that, with a project that had to benefit strongly from the cooperation between parties, he would get more chance to distribute the risks between him and the client in the first phase. He did not see this reflected, however, which is possibly due to the original intent of the contract, which was very much a traditional contract.

Table 4 - Shifts in the SBM framework (green = contractual agreements, orange = practical implication)



		TRANSACTIONAL (MARKET)			RELATIONAL (HYBRID)		INVESTMENT (HIERARCHY)
		BASIC PROVIDER	APPROVED PROVIDER	PREFERRED PROVIDER	PERFORMANCE-BASED/MANAGED SERVICES	VESTED	INVESTMENT (EQUITY PARTNER/ SHARED SERVICES)
BUSINESS MODEL							
Business Model	Economic Model	Transaction Based (per Transaction, Hour or Unit)	Transaction Based (per Transaction, Hour or Unit)	Transaction Based (per activity, hour or unit)	Output Based	Outcome Based	Transactional, Output or Outcome Based
Business Model	Relationship Model	Transactional/ no relationship	Transactional/ Supplier Vetted on "Approved" List	Relational Contract– Emerging Collaboration	Relational Contract– Collaborative	Relational Contract– Highly Collaborative	Investment Based
Vision & Intent		Supply at Lowest Cost	Recurring Commodities at Fair or Lowest Costs	Value Added Capabilities at Best Value	Performance to SLA– Process Efficiencies	Shared Vision, Desired Outcomes & Value Creation	Sustainable Value
SCOPE OF WORK							
Statement of Work & Objectives		"Who" and/or "How"	"Who" and/or "How"	"Who" and/or "How" with Jointly Defined "How"	"What" Limited Emphasis on "How"	"What"	"What if", "What for" and "When"
PERFORMANCE MANAGEMENT							
Performance Focus		Simple Three Way Accounting Match	PO Requirements	Activity Based Service Level Agreements	Output Based Service Level Agreements	Strategic Desired Outcomes	P&L Based Measures
Performance Measures		Right Quantity, Right Price, Damage Free	Basic Provider Metrics + Increased Quality Emphasis	Operational + Customer Satisfaction	Operational + Relational (Values & Behaviors)	Operational + Transformational + Relational System Wide KPIs	Joint Measures of Success
PRICING							
Pricing Model & Incentives		Fixed Price/Typically No Incentives/Volume Rebates	Fixed Price/Low No Incentives/Volume Rebates	Fixed Price/Low Incentives/Volume Rebates	Price with Incentives and/or Penalties	Pricing Model with Value Based Incentives	P&L Based Equity Sharing
GOVERNANCE							
Relationship Management		Delivery & Pricing Validation (Three Way PO Match)	Some Performance & Pricing Oversight	Limited Supplier Relationship Management	Oversight Emphasis: Supplier Relationship Management	Insight Emphasis: Strategic Relationship Management	Shared Control and Management
Improve, Transform, & Innovate		None/Market Driven	Limited/Market Driven	Beginning to Focus on Incremental Improvement	Supplier Driven to Meet SLAs/Price Glide Path	Joint & Proactive Transformation Management	Core Innovation Capabilities
Exit Management		One Way/Limited Commitment to Buy	One Way/Termination for Cause & Convenience	One Way/Termination for Cause & Convenience	Perf Based Termination for Cause w/Safeguards	Joint Exit Management Plan	Divestiture
Compliance & Special Concerns		Compliance Driven/ Survey Based	Typically Compliance Driven/ Survey Based	Typically Market Based/Minimum Audit Requirements	Corporate Based Audit Requirements	Outcome Based Joint Requirements	Investment Based Joint Requirements

3.7 DISCUSSION

During the course of the interviews, both client and contractor elaborated on topics that were not directly related to the SBM framework but can still be considered as a result from the design of the contract. These results will be touched upon in this section, as they may be of relevance for future research.

Firstly, both client and contractor mentioned that they noticed the significance of the mindset of the team members. Team members, especially in management positions, that were not used to working in collaboration with the other party, could restrict the cooperation significantly. Besides, the contractor mentioned that he felt that he could be less transparent to the client than the client was to him, which was a result of internal management decisions within his own organisation.

Both parties agreed that even though they collaboratively came up with the development tasks, the number of tasks to be done had escalated. This number of tasks turned out to be way more difficult to manage than intended, and the client mentioned that this could have been prevented by less specification of the tasks in the contract. Something that the contractor noticed and that ties into this is that even though both parties collaboratively came up with these development tasks, he felt as if he had to do most of the work in executing them. He mentioned that 'cooperation is a matter of giving and taking, but I had the feeling that we were taking more work than giving it away'.

4 CASE STUDY 2 – PROJECT 'HERINRICHTING NIEUWEZIJDS VOORBURGWAL NOORD'

The centre of Amsterdam is the location of the second case study, where the redevelopment of the Nieuwezijds Voorburgwal Noord takes place. This project is part of a larger programme called the 'Oranje Loper' (translated as the 'orange carpet'), which includes the redevelopment of several streets and bridges in the centre of Amsterdam. This chapter will give further background of this project and the contract that was signed by client and contractor, followed by an elaboration on the approach to cooperation and an analysis of the results from the expert interviews.

4.1 PROJECT DESCRIPTION

The Nieuwezijds Voorburgwal is the street that runs just behind the Royal Palace of Amsterdam, which is located at the Dam Square (see Figure 7). This central location of the street makes it a natural hotspot, where many forms of traffic congregate in a limited space: there are cars, cyclists, pedestrians, and trams, to name a few. The municipality of Amsterdam (Gemeente Amsterdam) is the commissioner of this project and their main motivation to redevelop the lay-out of the street is to achieve a better traffic flow for each form of transport. An extra tram stop will be added to allow for shorter transfer times (with the aim to improve the public transport flow with 20%, compared to 2012), and priority will be given to space for both cyclists and pedestrians. Beside these traffic-related goals, the municipality aims to make the street 'rainproof' (being able to handle heavy rainstorms) and to replace the obsolete cables and pipes that are currently in place. The municipality issues the project in collaboration with Stichting Waternet (a governance institution that deals with drinking water supply, sewerage, and water management), Liander N.V. (network operator) and GVB Infra B.V. (public transport operator in Amsterdam). The contractor that takes on this project is KWS, who joined the project in the beginning of 2021. At the time of writing, the project has started the execution phase.

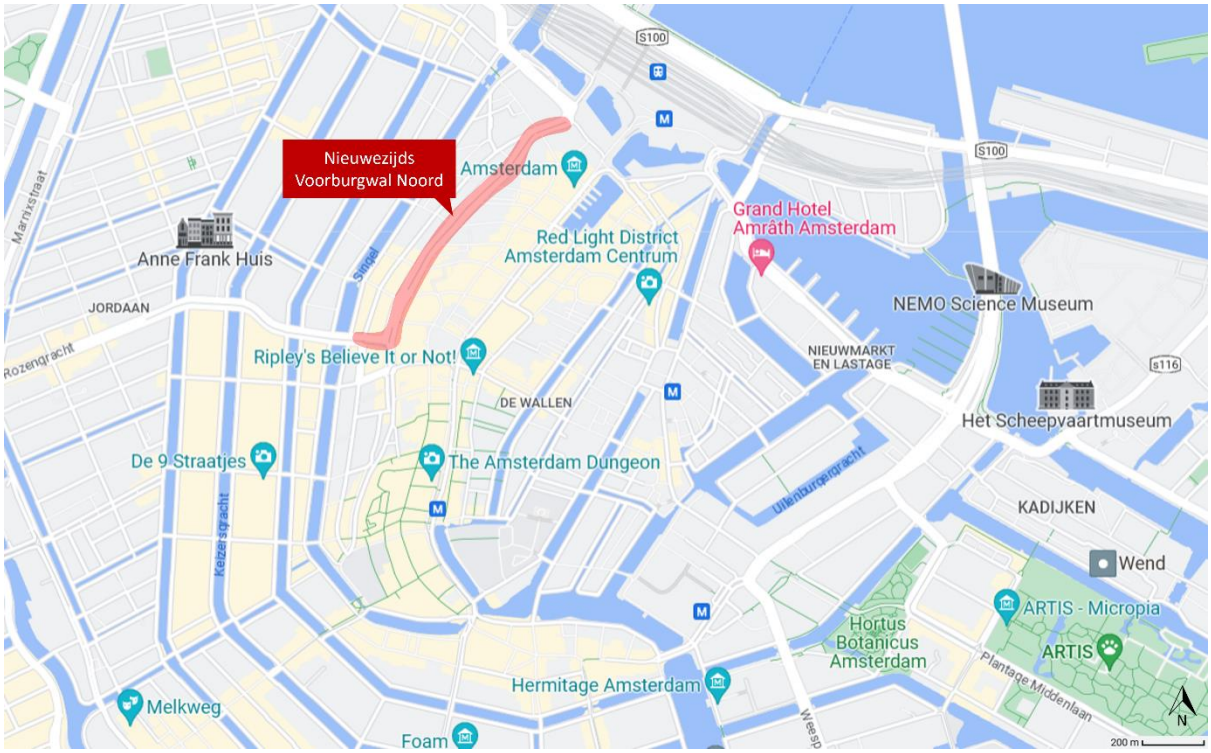


Figure 7 - Location of DNZN

4.2 CONTRACT DESIGN

The entire Nieuwezijds Voorburgwal is split into two different projects: one for the southern half of the street (De Nieuwe Zijde Zuid, DNZZ) and one for the northern half of the street (De Nieuwe Zijde Noord, DNZN). The works for DNZZ started at the beginning of 2021 and were finished around May 2022, at which time the works for DNZN started. The type of contract for both projects is significantly different: whereas DNZZ is designed as a traditional transactional contract (a so-called 'RAW-bestek'), DNZN is designed to be done under a two-phase contract, with a bouwteam. The aim is to use the lessons learned during DNZZ in the second part, DNZN.

Figure 8 gives a visualisation of the distribution of responsibilities in the various phases. The client enters the bouwteam-phase with a Programme of Requirements and some initial design choices, and based on this makes the Preliminary Design and the Final Design. The only contribution of the contractor to these stages is the review he does on both designs. The actual cooperation between client and contractor in the bouwteam-setup is focused on the approach for the execution of this project. The client needs the knowledge of the contractor about executing a project in this specific context (in central Amsterdam) and the bouwteam-phase is used to combine the expertise of both parties.

Figure 8 - Schematic overview of the different phases (DNZN)

4.3 APPROACH TO COOPERATION

The complexity of the project asks for a contract form that features Early Contractor Involvement, mainly focused on including the expertise of the contractor about the execution in the design. Early Contractor Involvement requires specific agreements on cooperation, which are captured in the so-called 'cooperation plan' ('samenwerkingplan'). Amongst others, this cooperation plan includes the formulation of a 'Mission statement', a signed vision shared by both parties, despite the acknowledgement that both act out of different interests:

> *"We collaboratively work on the project De Nieuwe Zijde Noord, to upgrade this street to a contemporary and sustainable level. In doing so, we use each other's knowledge, strength, and expertise. We respect each other's interest and serve the interests of the environment (internally and externally). We are transparent, pro-active, we can adopt a critical attitude and we celebrate our successes. We are constructive in discussions and find solutions together". [translated]*

Other agreements described in this cooperation plan are the organisational structure of the project teams and the core-team ('kernteam'), the planned activities to benefit the cooperation, the structure of the meetings, and the tasks and responsibilities per party.

Especially considering the tasks and responsibilities of each party, a broad range of tasks that are not specified in detail yet can be recognised. This includes activities such as refining designs, reviewing work, risk assessments and cost estimates. The division and responsibilities of these tasks varies between the client and the contractor, based on the expertise that is required. Many tasks related to the approach to the execution phase are the responsibility of the bouwteam itself, indicating a close cooperation between both parties.

4.4 RESULTS DESKTOP STUDY

The results of the desktop study, in which the characteristics of the contract are mapped against the SBM framework as introduced by Vitasek et al. (2016), can be found in Table 5 and are verified by the bouwteam-supervisor within W+B.

A quick glance over the SBM framework reveals that the choices made in the categories do not follow only one Sourcing Business Model, but rather a selected few of them. On the one hand, the contract and the cooperation plan express the desire for a collaborative environment (as reflected in the Mission statement). This is, however, not reflected in the pricing model (neither incentives nor penalties have been used), as well as in the Statement of Work: the contractor had little freedom in the design of the redevelopment and their knowledge was only required for a limited part in the process: the execution challenges. The biggest outlier can be found in the 'improve, transform & innovate' category: the bouwteam-phase is mainly used as optimalisation phase, and there was no explicit focus on innovation. Further insights in the choices regarding the Sourcing Business Models made for each category can be found in Appendix 2.

Table 5 - Contract of DNZN mapped against the SBM framework

		TRANSACTIONAL (MARKET)		RELATIONAL (HYBRID)			INVESTMENT (HIERARCHY)
		BASIC PROVIDER	APPROVED PROVIDER	PREFERRED PROVIDER	PERFORMANCE-BASED/MANAGED SERVICES	VESTED	INVESTMENT (EQUITY PARTNER/ SHARED SERVICES)
BUSINESS MODEL							
Business Model	Economic Model	Transaction Based (per Transaction, Hour or Unit)	Transaction Based (per Transaction, Hour or Unit)	Transaction Based (per activity, hour or unit)	Output Based	Outcome Based	Transactional, Output or Outcome Based
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SCOPE OF WORK							
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PRICING							
Pricing Model & Incentives		Fixed Price/Typically No Incentives/Volume Rebates	Fixed Price/Low No Incentives/Volume Rebates	Fixed Price/Low Incentives/Volume Rebates	Price with Incentives and/or Penalties	Pricing Model with Value Based Incentives	P&L Based Equity Sharing
GOVERNANCE							
Relationship Management		Delivery & Pricing Validation (Three Way PO Match)	Some Performance & Pricing Oversight	Limited Supplier Relationship Management	Oversight Emphasis: Supplier Relationship Management	Insight Emphasis: Strategic Relationship Management	Shared Control and Management
Improve, Transform, & Innovate		None/Market Driven	Limited/Market Driven	Beginning to Focus on Incremental Improvement	Supplier Driven to Meet SLAs/Price Glide Path	Joint & Proactive Transformation Management	Core Innovation Capabilities
Exit Management		One Way/Limited Commitment to Buy	One Way/Termination for Cause & Convenience	One Way/Termination for Cause & Convenience	Perf Based Termination for Cause w/Safeguards	Joint Exit Management Plan	Divestiture
Compliance & Special Concerns		Compliance Driven/ Survey Based	Typically Compliance Driven/ Survey Based	Typically Market Based/Minimum Audit Requirements	Corporate Based Audit Requirements	Outcome Based Joint Requirements	Investment Based Joint Requirements

4.5 RESULTS INTERVIEW

As the project of DNZN is part of the programme 'de Oranje Loper', it was predetermined that the project would be executed in a two-phase contract. Interviews with both the client and the contractor made clear that this project could have been executed with a different contract model (as had been done with DNZZ), but that collaboration in a bouwteam brought along several advantages, such as establishing a long-term relationship between the involved parties and the early involvement of other relevant organisations (GVB, Liander, Waternet). Besides, the lessons learned from DNZZ could now easily be implemented in DNZN. Defining the objectives for DNZN would be as follows:

The goal of the project is the redevelopment of the Nieuwezijds Voorburgwal Noord to make the area more pleasant to reside in by allowing more space for cyclists, pedestrians, public transport and greenery, and less for motorised vehicles.

The goal of the cooperation is to incorporate the contractor's expertise about the execution of such a complex project, in combination with incorporating his knowledge about specific engineering problems.

The engineering problems that required the knowledge of the contractor were about laying cobblestones in the area behind the Dam palace, and about making the area underneath the tram rails rainproof.

Table 5 shows a high degree of cherry-picking in the contractual characteristics and the interviews were used to obtain insights in the reasoning behind these choices and the influence these choices had on the collaboration between the two parties and thus on the achievement of the project objectives. The categories of interest are 'scope of work', 'pricing' and 'improve, transform & innovate'.

4.5.1 SCOPE OF WORK

As reflected in the goal of the cooperation, the main reason to collaborate in a bouwteam was to incorporate the client's specific expertise and knowledge concerning only a few matters. The design was and would be made by the client itself, without much contribution from the contractor beside the general reviewing tasks. This choice was deliberate and agreed upon by both parties: client and contractor collaboratively said that the knowledge needed to make a design that would meet all the requirements set for projects in the centre of Amsterdam was possessed by the client, which makes the choice to let the client make this design sensible. The contractor simply lacked the knowledge of these requirements; besides, the choice to let a contractor make the design is usually being made to give freedom to the market to deliver novel design solutions, but the degrees of freedom were heavily reduced with the aforementioned rules and regulations. Combining all, both parties agreed that letting the client design would be the most sensible choice.

4.5.2 PRICING

Both parties were content with the way the price was monitored during this project. There was, however, no full consensus on the topic of penalties and incentives: the client believed that penalties are required when the risks of time overrun are too high (in this project, he used decommissioning of the tram and metro as an example); the contractor, however, expressed a disapproval of these concepts. The reason for this disapproval found its origins in the contractor's belief that cooperation in a bouwteam-phase should stimulate to deliver the right quality at the right time, and using incentives and penalties would only obstruct that stimulant. Both parties did agree on the statement that quality is likely to be compromised by using penalties or incentives.

4.5.3 IMPROVE, TRANSFORM & INNOVATE

When asked if there was any innovation in this project, both parties mentioned the engineering of cobblestones in the area behind the Dam palace and the rainproof system underneath the tram rails. There was, however, uncertainty in whether these engineering tasks (for which the knowledge of the contractor was specifically required) could be classified as 'innovation'. To explain this statement, a distinction needs to be made between the two engineering tasks. On the one hand, the engineering of

the cobblestones does not entirely comply to the definition of innovation, but is rather a pre-defined object that will undergo some improvements. On the other hand, the rainproof system was not explicitly specified in the ITT: the contractor even mentioned that if this system proved to be too expensive, it would not be applied. Both parties agreed that innovation was not the focus of this project, which indicates that close cooperation between parties does not necessarily imply a high need for innovation.

4.6 Summary results

Mapping the contractual characteristics against the SBM framework shows a high degree of cherry-picking between the several models. Both parties, however, acknowledged that this project and the cooperation within the project team was very successful, and that this was not negatively influenced by the choice of contract characteristics. Further explanation from the contractor revealed that this cherry-picking was even preferred, because that is how you can tailor a contract to the specific project requirements. No project in the construction industry is the same, and all will require a different implementation of contractual characteristics. The client agreed with this and added that corresponding to the statement that no project will require the same contract model, no contract model requires the same degree of cooperation. Besides, no contract is completely set in stone: there is always a 10-20% leverage built in, where the relationship between the client and the contractor can flourish. As the contractor quoted: “a good contractor does not require a contract, and no contract can be written for a bad contractor”.

4.7 Discussion

Several findings were made during the interview that do not directly relate to the categories in the SBM framework, but that did influence the relationship between the client and the contractor. The most elaborately discussed findings will be presented here, as these are believed to be of most importance.

Both the client and the contractor expressed the importance of the mindset of the people involved in the bouwteam: this can make or break the relationship between parties and the effectiveness of the bouwteam itself. Not only does this apply to the mindset of the individuals in the team, but also to the organisation of the involved parties. This specific bouwteam was composed of multiple parties: the client, the contractor, but also third parties such as GVB, Liander and Waternet. Not every organisation was prepared for the intense and time-consuming nature of a bouwteam, which obstructed a smooth cooperation.

Whereas the mindset of the team players was thought to be a determining factor in the success of a bouwteam-phase, another feature that was mentioned was the time set aside for this phase. Both the client and the contractor agreed that the time allocated to the bouwteam-phase was too short and that this mainly influenced the price negotiations towards the end of this phase. An additional complicating factor was the price increases as a result from the Russian invasion of Ukraine in the beginning of 2022; client and contractor eventually got to an agreement, but allocating more time to the bouwteam-phase could have prevented matters from escalating.

Another determining factor in the success of the bouwteam is the start-up of this phase. This start-up was supported by W+B and aimed to properly introduce the involved parties to each other and collaboratively express expectations and potential pitfalls, to ensure that everyone was on the same page. Simultaneously, explicit conversations about the collaboration were held to create awareness of its importance for the team members. The client additionally mentioned that the cooperation that was established during the first phase was being continued to the execution phase, which benefitted the works being done in that phase as well.

5 CASE STUDY 3 – PROJECT 'VERVANGEN VAL NELSON MANDELABRUG'

The third and final project to analyse is the replacement of the moveable span in the Nelson Mandelabrug, a bridge situated in the city of Utrecht. This chapter will provide the necessary background information before describing the main project objectives, the cooperation that was required for achieving these objectives and the way this was reflected in the contract.

5.1 PROJECT DESCRIPTION

This project was commissioned by the municipality of Utrecht (Gemeente Utrecht) and was initiated through research into the life span of the span of the bridge, which is also defined as the moveable part of a vertical-lift bridge. This research found that the span will reach the end of its life span within 2.5 years from the moment of investigation, which resulted in an aim to replace the span before the end of 2023. One of the major challenges in this project is the connection between the steel parts of the bridge and the bridge deck made of composite. The location and details of the bridge can be seen in Figure 9.

Figure 9 - Location of the NMB

5.2 CONTRACT DESIGN

The municipality of Utrecht has divided the entire project into three separate phases, which are distinguished as follows:

Phase 1. The design phase, executed by the municipality and their advisor, in this case Witteveen+Bos. This phase will be dedicated to the design of the bridge up until the creation of the Preliminary Design (PD).

Phase 2. The 'bouwteam'-phase, which is where the contractor joins the team. The goal of this phase is to use the expertise of the contractor to develop the PD into a Final Design (FD) and the Detailed Specifications (DS). This will be done under the conditions of DNR-2011.

Phase 3. The execution phase, where the contractor will execute the works as specified in the FD and the Detailed Specifications. This will be done under the conditions of UAV-2012.

Phase 2 lasted for 7 months (from February 2022 until September 2022) and was followed by phase 3, which is being executed at the time of this writing. A schematic representation of this process can be found in Figure 10:

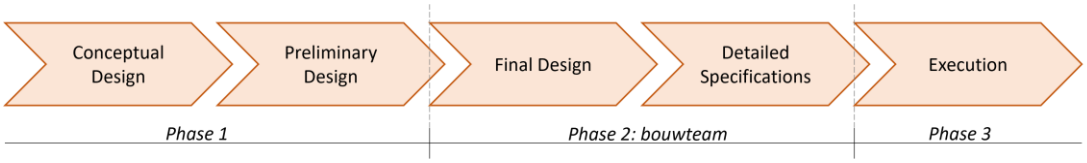


Figure 10 - Schematic overview of the different phases (NMB)

5.3 Approach to collaboration

In their Instructions to Tenderers, the municipality of Utrecht states several reasons for choosing to collaborate with the contractor in a bouwteam: this being the complexity of the work, the budget, the short timeframe, the desire for innovation and the wish for alignment between the design and the execution phase. This is reflected in the project goals as well, which are:

- The realisation of the work within budget;
- The alignment of the tasks of client and contractor in both the preparation and execution of the work;
- The realisation of the work within the allocated time.

The municipality believes that this can only be achieved with the right cooperation between client, contractor, and consulting company. Note that the consultancy company here works on behalf of the client and executes the tasks in which the client lacks sufficient knowledge. The allocation of the tasks to be executed during the bouwteam-phase is based on the expertise of the respective parties; designing, reviewing or approving can thus be done by different organisations, based on who is most qualified.

The awarding of the bid is based on three components, being:

1. Plan of Approach (weight of 70%), which needs to include, amongst others, the plan for cooperation with the client, project control elements such as costs, time and quality, risk management, achievement of Best Value;
2. The scoring of this project on the CO_2-performance scale (weight of 5%);
3. Price of the bid (25%).

5.4 Results desktop study

The contract for the bouwteam-phase will be analysed and mapped against the SBM framework, as can be seen in Table 6; this process has been verified by the project leader within W+B.

Table 6 shows that most categories follow characteristics from the performance-based model, with a few exceptions. With regards to pricing, the client has expressed the desire to obtain the most value within the budget, an approach that corresponds to the Best Value approach. This budget is predetermined and fixed in accordance with the bid of the contractor, and neither incentives nor penalties are included. Concerning the relationship management, explicit agreements regarding the monitoring of the relationship emphasise the importance of cooperation in this project. This is contrary to the degree of innovation within this project: this project is mainly focused on the technical engineering challenge and there is no mention of the desire to innovate or transform a process. Further explanation of the choices made for each category can be found in Appendix 3.

Table 6 - Contract of the NMB mapped against the SBM framework

		TRANSACTIONAL (MARKET)		RELATIONAL (HYBRID)			INVESTMENT (HIERARCHY)
		BASIC PROVIDER	APPROVED PROVIDER	PREFERRED PROVIDER	PERFORMANCE-BASED/MANAGED SERVICES	VESTED	INVESTMENT (EQUITY PARTNER/ SHARED SERVICES)
BUSINESS MODEL							
Business Model	Economic Model	Transaction Based (per Transaction, Hour or Unit)	Transaction Based (per Transaction, Hour or Unit)	Transaction Based (per activity, hour or unit)	Output Based	Outcome Based	Transactional, Output or Outcome Based
Business Model	Relationship Model	Transactional/ no relationship	Transactional/ Supplier Vetted on "Approved" List	Relational Contract– Emerging Collaboration	Relational Contract– Collaborative	Relational Contract– Highly Collaborative	Investment Based
Vision & Intent		Supply at Lowest Cost	Recurring Commodities at Fair or Lowest Costs	Value Added Capabilities at Best Value	Performance to SLA– Process Efficiencies	Shared Vision, Desired Outcomes & Value Creation	Sustainable Value
SCOPE OF WORK							
Statement of Work & Objectives		"Who" and/or "How"	"Who" and/or "How"	"Who" and/or "How" with Jointly Defined "How"	"What" Limited Emphasis on "How"	"What"	"What if", "What for" and "When"
PERFORMANCE MANAGEMENT							
Performance Focus		Simple Three Way Accounting Match	PO Requirements	Activity Based Service Level Agreements	Output Based Service Level Agreements	Strategic Desired Outcomes	P&L Based Measures
Performance Measures		Right Quantity, Right Price, Damage Free	Basic Provider Metrics + Increased Quality Emphasis	Operational + Customer Satisfaction	Operational + Relational (Values & Behaviors)	Operational + Transformational + Relational System Wide KPIs	Joint Measures of Success
PRICING							
Pricing Model & Incentives		Fixed Price/Typically No Incentives/Volume Rebates	Fixed Price/Low No Incentives/Volume Rebates	Fixed Price/Low Incentives/Volume Rebates	Price with Incentives and/or Penalties	Pricing Model with Value Based Incentives	P&L Based Equity Sharing
GOVERNANCE							
Relationship Management		Delivery & Pricing Validation (Three Way PO Match)	Some Performance & Pricing Oversight	Limited Supplier Relationship Management	Oversight Emphasis: Supplier Relationship Management	Insight Emphasis: Strategic Relationship Management	Shared Control and Management
Improve, Transform, & Innovate		None/Market Driven	Limited/Market Driven	Beginning to Focus on Incremental Improvement	Supplier Driven to Meet SLAs/Price Glide Path	Joint & Proactive Transformation Management	Core Innovation Capabilities
Exit Management		One Way/Limited Commitment to Buy	One Way/Termination for Cause & Convenience	One Way/Termination for Cause & Convenience	Perf Based Termination for Cause w/Safeguards	Joint Exit Management Plan	Divestiture
Compliance & Special Concerns		Compliance Driven/ Survey Based	Typically Compliance Driven/ Survey Based	Typically Market Based/Minimum Audit Requirements	Corporate Based Audit Requirements	Outcome Based Joint Requirements	Investment Based Joint Requirements

5.5 RESULTS INTERVIEWS

Both the client and the contractor were interviewed for this project to obtain more insight into their perspectives on the contract and how it influenced their mutual relationship. The transcripts of the interviews and the respective answers to the questions asked can be found in Appendix 5, as a separate document.

The client of this project revealed that this project was not originally intended to be executed in a two-phase contract. Renovating a bridge is usually done in a traditional way (for instance with an 'RAW-bestek', or DBB contract), but technical investigations suggested that this project would benefit from a bridge deck made of light material, for which composite seemed the right fit. There is, however, only limited knowledge about composite available and the client would need to collaborate with the market to exchange this knowledge most efficiently: cooperation in a bouwteam-phase thus seemed most suitable for this stage. The second reason for working in a bouwteam-phase was the fact that there were multiple variants for possible solutions to achieve the goal of the project. There is a small number of contractors specialised in this field and all had different opinions about which variant to use, and a

bouwteam-phase would allow the contractors to explain their motivation to choose one variant without ruling out the other parties by expressing a preference ahead of time.

Summarising this, one could say that the goal of the project is to replace the moveable span of the Nelson Mandelabrug with using composite as a material.

The goal of the cooperation is to combine the knowledge of composite, which the client lacked, with the client's knowledge of steel to come to an executable solution.

Table 6 shows that this project, unlike the previous two case studies, has the least deviating categories, but some findings that consolidate the findings of the other two case studies can be presented.

5.5.1 PRICING

Both parties mentioned that the price was not the priority during the bouwteam-phase, and that it was solely monitored to prevent unnecessary increases. Only when getting closer to the execution stage became the price more apparent, especially considering the cost increases that emerged after the Russian invasion in Ukraine. This increase of price, however, did not emerge as a significant problem, due to the fact that an atmosphere for open discussion was facilitated in the bouwteam-phase.

Both parties did agree on the statement that both penalties and incentives are not beneficial when working in a bouwteam. The client mentioned the quality that gets compromised when contractors are stimulated to deliver faster, and the contractor mentioned the loss of motivation to collaborate, since he believes that incentives and penalties stimulate opportunistic behaviour.

Considering these two topics, it becomes clear that both parties believe that non-fixed prices work in a bouwteam-setup, but only without the use of penalties and incentives. This is contrary to what the SBM framework proposes as the pricing model belonging to relational contracts.

5.5.2 IMPROVE, TRANSFORM & INNOVATE

The contract stated, very briefly, that the client wanted to 'challenge the market to deliver some form of innovation', and when questioning both parties, they explained that this clause emerged from the fact that the client lacked knowledge about combining composite with steel and needed to ask the market to find an appropriate solution. The clause did not imply a need for product-related inventions, but mainly resulted from the client's knowledge gap in this field.

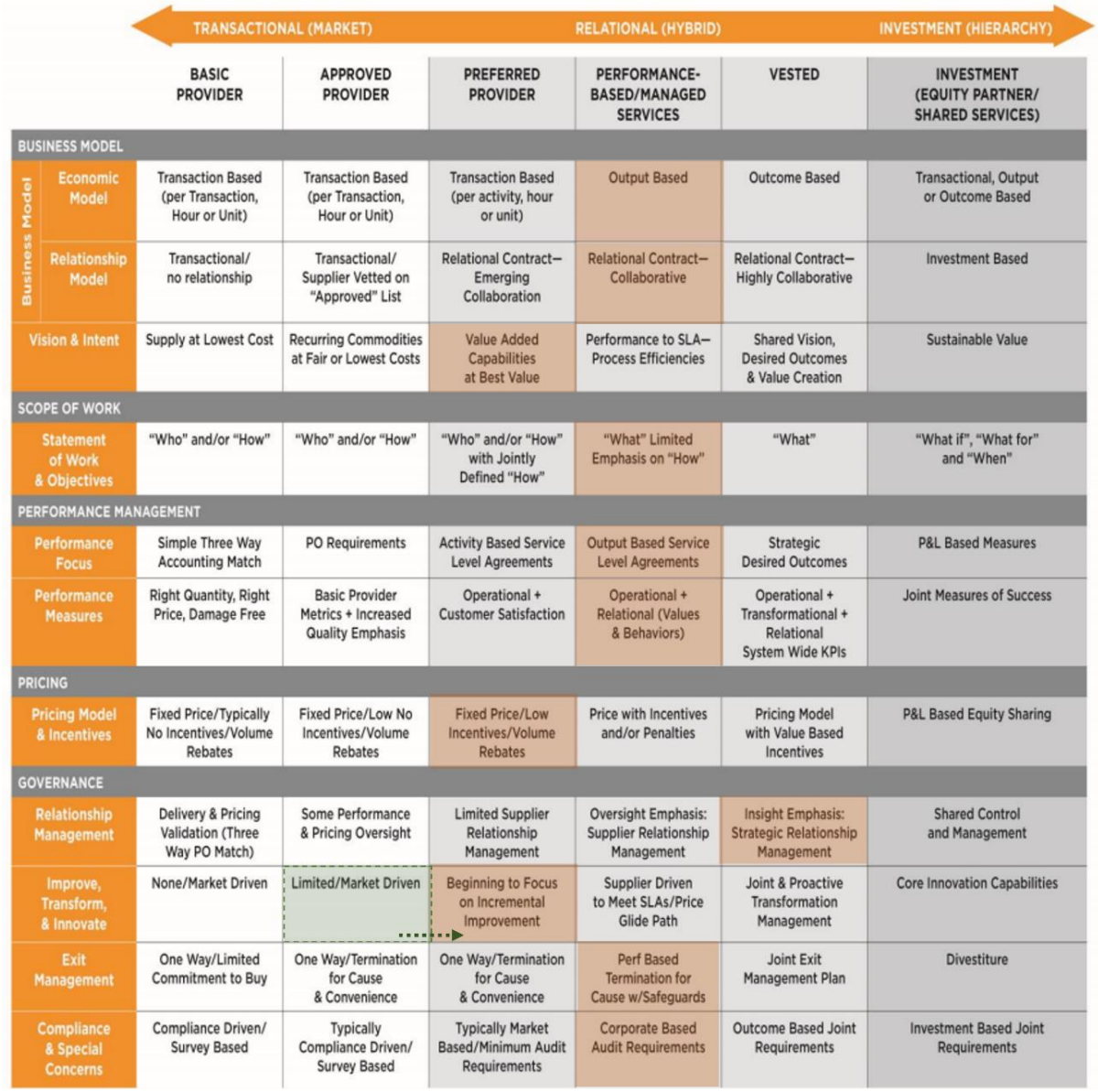
Because the client did consider the interaction between steel and concrete as a certain 'innovation', he proposed to shift the category to the preferred provider model.

5.6 SUMMARY RESULTS

When asked if they thought any changes in the contract, related to the SBM framework, would lead to a better mutual relationship, both parties answered that they did not think this was necessary. The things that did cause some discussion could not be related to the specific characteristics of the contract, at least not to those prescribed in the SBM framework – an elaboration on these additional findings will be given in the following section, 'Discussion'. The client did propose to shift the category of 'improve, transform & innovate' to the preferred provider model, which would result in an implementation of the framework as in Table 7.

Moreover, the client did propose an interesting view on the framework, as a way to implement it in daily practice. He suggested to use the framework at front, to map the relevant elements of the project and the contractual agreements that belong to it. Characteristics of different models can be chosen, based on the benefit they bring to the project. As the client stated: "no form of contract is perfect", implying that there is no model that fits a project perfectly and that tailored contract characteristics need to be chosen to diminish the disadvantages that following one specific model would bring along.

Table 7 - Shifts in the SBM framework (green = contractual agreements, orange = practical implication)



		TRANSACTIONAL (MARKET)		RELATIONAL (HYBRID)			INVESTMENT (HIERARCHY)
		BASIC PROVIDER	APPROVED PROVIDER	PREFERRED PROVIDER	PERFORMANCE-BASED/MANAGED SERVICES	VESTED	INVESTMENT (EQUITY PARTNER/ SHARED SERVICES)
BUSINESS MODEL							
Business Model	Economic Model	Transaction Based (per Transaction, Hour or Unit)	Transaction Based (per Transaction, Hour or Unit)	Transaction Based (per activity, hour or unit)	Output Based	Outcome Based	Transactional, Output or Outcome Based
Business Model	Relationship Model	Transactional/ no relationship	Transactional/ Supplier Vetted on "Approved" List	Relational Contract—Emerging Collaboration	Relational Contract—Collaborative	Relational Contract—Highly Collaborative	Investment Based
Vision & Intent		Supply at Lowest Cost	Recurring Commodities at Fair or Lowest Costs	Value Added Capabilities at Best Value	Performance to SLA—Process Efficiencies	Shared Vision, Desired Outcomes & Value Creation	Sustainable Value
SCOPE OF WORK							
Statement of Work & Objectives		"Who" and/or "How"	"Who" and/or "How"	"Who" and/or "How" with Jointly Defined "How"	"What" Limited Emphasis on "How"	"What"	"What if", "What for" and "When"
PERFORMANCE MANAGEMENT							
Performance Focus		Simple Three Way Accounting Match	PO Requirements	Activity Based Service Level Agreements	Output Based Service Level Agreements	Strategic Desired Outcomes	P&L Based Measures
Performance Measures		Right Quantity, Right Price, Damage Free	Basic Provider Metrics + Increased Quality Emphasis	Operational + Customer Satisfaction	Operational + Relational (Values & Behaviors)	Operational + Transformational + Relational System Wide KPIs	Joint Measures of Success
PRICING							
Pricing Model & Incentives		Fixed Price/Typically No Incentives/Volume Rebates	Fixed Price/Low No Incentives/Volume Rebates	Fixed Price/Low Incentives/Volume Rebates	Price with Incentives and/or Penalties	Pricing Model with Value Based Incentives	P&L Based Equity Sharing
GOVERNANCE							
Relationship Management		Delivery & Pricing Validation (Three Way PO Match)	Some Performance & Pricing Oversight	Limited Supplier Relationship Management	Oversight Emphasis: Supplier Relationship Management	Insight Emphasis: Strategic Relationship Management	Shared Control and Management
Improve, Transform, & Innovate		None/Market Driven	Limited/Market Driven	Beginning to Focus on Incremental Improvement	Supplier Driven to Meet SLAs/Price Glide Path	Joint & Proactive Transformation Management	Core Innovation Capabilities
Exit Management		One Way/Limited Commitment to Buy	One Way/Termination for Cause & Convenience	One Way/Termination for Cause & Convenience	Perf Based Termination for Cause w/Safeguards	Joint Exit Management Plan	Divestiture
Compliance & Special Concerns		Compliance Driven/ Survey Based	Typically Compliance Driven/ Survey Based	Typically Market Based/Minimum Audit Requirements	Corporate Based Audit Requirements	Outcome Based Joint Requirements	Investment Based Joint Requirements

5.7 Discussion

As stated before, the client and the contractor expressed certain discussions that had arisen during the course of the project that could not related to the choice in contract characteristics. These topics will be discussed in this section, as they do not affect the findings about the SBM framework but can give relevant insights into determining factors for the effectiveness of a bouwteam-phase.

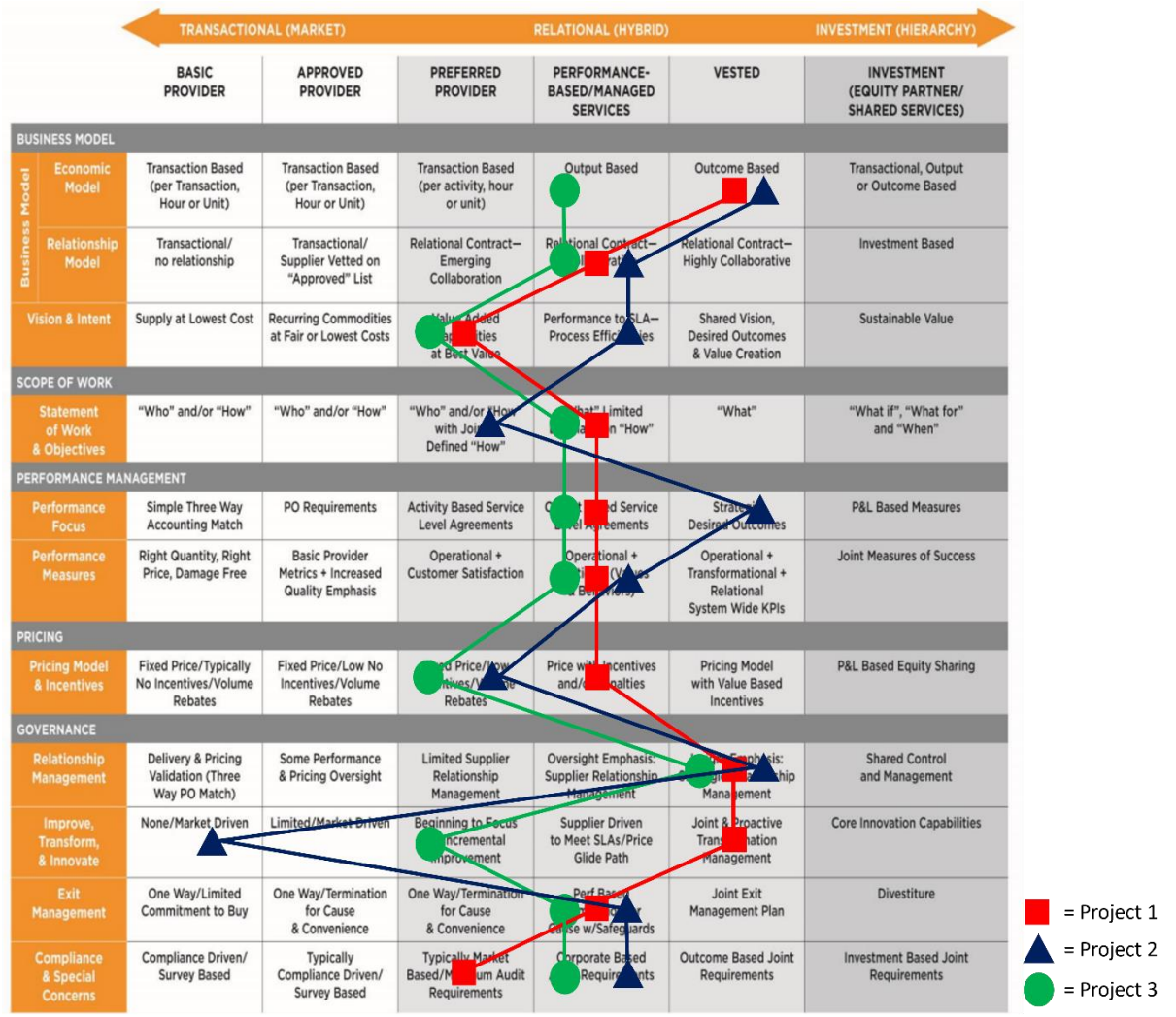
The client noticed a stark difference in cooperation between the bouwteam-phase and the execution phase, in the sense that the collaboration that was established during the bouwteam-phase did not continue to the execution phase. The client mainly contributed this to the change in team composition and the change in legal conditions (the contract for the bouwteam-phase was written under the conditions of DNR 2011, whereas the contract for the execution phase was written under the conditions of UAV 2012). A solution that was offered by the client is to work with a so-called 'umbrella agreement', such that the bouwteam-phase and execution phase are executed under the same conditions. This would prevent the negative consequences of the transition between the two phases and stimulate to continue the relationship that was built in the first phase.

The contractor did not necessarily notice any consequences of the shift between bouwteam-phase and execution phase, but he did mention the discussion that arose about the planning, and especially the delay of the planning, towards the end of the bouwteam-phase. This is a common issue in such projects and after many discussions, both parties found a solution they both agreed upon. When asked whether this could have been prevented with different contractual characteristics, the parties denied this – this was more related to the relationship and mutual willingness to discuss, rather than the legally agreed terms. They believed that the contract can, however, create an environment that facilitates these discussions.

6 ANALYSIS OF THE RESULTS

After the analysis of the individual case studies, the results can be collected and compared in a cross-case study. An overview of the contractual characteristics mapped against the SBM framework for each project, including the modifications made by the respective clients and contractors, can be found in Table 8. This figure shows patterns in the gathered data and hence supports in connecting the contractual characteristics to the achievement of the projects' cooperation goals. Additionally, corresponding statements will be collected and used to explain the found phenomena; a tabulated analysis of these statements can be found in Appendix 6.

Table 8 - Cross-case study



As Table 8 indicates, none of the contracts follow the characteristics of only one model – all three case studies feature a certain degree of cherry-picking between the characteristics of the seven Sourcing Business Models. Table 9 gives an overview of the degree of cherry-picking between the contract models: the numbers indicate how many categories in the contract follow the characteristics of that specific Sourcing Business Model. This overview reveals that project 2 features the highest degree of cherry-picking, whereas project 3 features the lowest degree of cherry-picking. Besides, it shows that project 3 leans most towards the left side of the SBM framework compared to project 1 and 2, implying that the contract of this case study features more transactional elements than the contracts of the other two case studies.

Table 9 - Number of categories within each Sourcing Business Model

	Basic provider	Preferred provider	Performance-based	Vested
Project 1	0	2	6	3
Project 2	1	2	5	3
Project 3	0	3	7	1

The goal of the cooperation for each case study can be summarised as follows:

Project 1. Exchanging knowledge about innovation and development of a new system.
Project 2. Exchanging knowledge about the execution phase.
Project 3. Exchanging knowledge about technical engineering tasks.

Beside the exchange of knowledge, other reasons that interviewees mentioned for using a two-phase contract (and committing to a high degree of cooperation) were gaining time, determining a fair price for the execution phase, and determining a fair distribution of the risks. Comparing the goal of the cooperation with the contractual characteristics as mapped against the SBM framework shows a contrast between the type of agreements made for a technical engineering challenge and those made for an innovative development challenge: whereas the former leans more towards the transactional contracts, the latter implements more characteristics of stronger relational models.

Elaborating on the concept of cherry-picking, none of the interviewees thought that this necessarily had a negative effect on the relationship between the involved parties; in fact, they thought it to be inevitable, considering the diverse nature of projects in the construction industry. The statement that 'cooperation between client and contractor will be more successful with a strong adherence to one Sourcing Business Model' is thus rejected, as a logical result from finding contradicting evidence. Nevertheless, two nuances were repeatedly mentioned:

1. Even though the agreements made in the contract follow a certain combination of characteristics, almost all interviewees mentioned that they had the freedom to deviate from these agreements in situations where this benefited the cooperation. Interestingly, mapping these deviations in the framework led to a higher degree of adherence to the characteristics of one Sourcing Business Model. This suggests that the agreements in the contracts leave room for parties to naturally adapt to a combination of characteristics required to achieve the project's objectives.
2. Secondly, it became clear that not all the descriptions in the original SBM model are applicable to the Dutch construction industry. This concerned the categories of 'pricing' and 'improve, transform & innovate', about which interviewees repeatedly asked questions concerning their relevance and applicability.
   Regarding the category of 'pricing', all the interviewees spoke negatively about the use of incentives and/or penalties: using these would compromise on the desired quality. Besides, one interviewee even mentioned the potential compromise on the motivation to prioritise cooperation between parties. Regarding the category of 'improve, transform & innovate', it was found that the need for innovation was vastly different between the three case studies. The interviewees of project 2 and 3 mentioned that innovation is not something that is related to the degree of cooperation within a project. More than once, the goal of the project was not to be innovative or to transform a process, but rather to share knowledge. Following that line of thought, a 'more relational contract' does not necessarily imply a higher need for innovation.

Summarising the findings shows that objectively mapping contractual characteristics against a framework does not necessarily give relevant results about its influence on the cooperation between client and contractor, apart from the fact that such a framework might not even be fully applicable in the construction industry. This suggestion and other findings that are not directly related to the research questions will be elaborated on and presented in the following chapter.

7 DISCUSSION

This research is based on the Sourcing Business Model theory, which was introduced in a study by Vitasek et al. (2016). The framework proposed in this theory distinguishes seven Sourcing Business Models, applicable in a wide range of disciplines, and was used to allow for easier comparison between the case studies as researched in this thesis. However, further analyses have revealed that not all elements in the original SBM framework are equally applicable to the construction industry. This chapter will thus propose an adapted framework that is targeted to this industry, resulting from the findings discussed in Chapter 6. Moreover, it will address the validity and limitations of this research, finalised by recommendations for further research.

7.1 THE SBM FRAMEWORK, ADAPTED

Table 10 shows the proposed SBM framework when targeted specifically to the construction industry. The colours in this framework represent four different categories (shown in green, yellow, light orange and dark orange), ranging from minor alterations to major alterations made in the descriptions and concepts presented in the framework. The reasoning for the choices made will briefly be explained, before elaborating on the implications of these alterations when applied in practice.

The green category is formulated exactly as in the original framework; no changes have been made. This is the case for the investment models, as these fall beyond the scope of this study and no further research has thus been done into these categories. This also applies to the category of 'exit management', where the descriptions are sensible when applied to the construction industry.

For most categories the description has been slightly changed, as is indicated with the yellow category. The origin of these altered descriptions can all be found in the research done by Vitasek et al. (2016), it is merely that the focus of the description that was chosen to be presented has shifted. In some cases, the words 'client' and 'contractor' have substituted the words 'buyer' and 'supplier/provider'.

As with the yellow categories, the descriptions in the light orange category do follow a similar concept as the one as elaborated on in the research of Vitasek et al. (2016), with slight alterations to be more applicable to the construction industry. Most alterations in this category find their origin in the interviews held with experts in this field. Based on these interviews, the relationship model, Vested model, now indicates that the two parties not only pursue their own interests, but also share a common (financial) interest. In the category of performance measures, the choice has been made to change the measures on operational tasks and three-way matching to criteria (such as price and planning) based on the bid made by the contractor; five out of six interviewees mentioned that these are used by the client to assess the performance of the contractor. In the relationship management category, these are also the criteria that are assessed by the client to monitor his relationship with the contractor.

Finally, there are two concepts that do not correspond to the original framework, as marked with the dark orange category; these have been introduced in the analysis in Chapter 6. As mentioned there, all interviewees suggested that penalties and incentives are not sensible to apply in the construction industry, since it only stimulates to compensate on quality. Instead of the original descriptions, pricing models that are commonly used in the construction industry have been used as a substitute: this is a fixed price (based on the contractor's bid) for the transactional models, and a price based on actual expenses (in Dutch: 'regie-basis') for the relational models, with the addition of shared risk and responsibilities for the Vested models. Finally, the decision has been made to omit the 'improve, transform & innovate' category entirely from the framework. Four interviewees suggested that a desire for closer collaboration does not necessarily correlate with a more innovative project. This is reflected in the cooperation goals as summarised in the preceding chapter: even though an innovative project does require a high degree of cooperation (project 1), projects featuring a high degree of cooperation do not necessarily feature a high degree of innovation (project 2, project 3).

Table 10 - The SBM framework targeted to the construction industry, alterations marked with colours

	Transactional (market)			Relational (hybrid)		Investment (hierarchy)
	Basic provider	**Approved provider**	**Preferred provider**	**Performance-based**	**Vested**	**Investment**
BUSINESS MODEL						
Economic model	Transaction based (per activity), no preselection of contractors	Transaction based (per activity), a few selected contractors can bid	Transaction based (per activity), client has chosen one preferred contractor	Output based, focused on project result	Outcome based, focused on project result and consequences for the environment	Transactional, output or outcome based
Relationship model	No collaboration, clear distinction between client and contractor	No collaboration, but potential for repeat future business	Emerging collaboration, WIIFWe-approach.	Collaborative, exchange of expertise, win-win approach	Highly collaborative, less distinction between traditional client-contractor roles	Investment based
Vision & Intent	Focused on lowest price for a bid	Use of framework agreement	Aimed to achieving Best Value	High focus on project performance, rather than on lowest price	Client and contractor formulate a mutual vision, which they are collaboratively pursuing	Sustainable value
SCOPE OF WORK						
Statement of Work & Objectives	"Who" and/or "how" (client determines who will execute his tasks)	"Who" and/or "how" (client determines who will execute his tasks)	"Who" and/or "how" with jointly defined "how"	"What" limited emphasis on "how" (client indicates the desired result, is less involved in how this is achieved)	"What" (client indicates the desired outcome and relies on the expertise of the contractor to determine the "how")	"What if", "what for" and "when"
PERFORMANCE MANAGEMENT						
Performance Focus	Does the project meet the requirements?	Does the project meet the requirements?	Does the project meet the requirements?	Is the desired output achieved?	Is the desired outcome achieved?	P&L based measures
Performance Measures	Based on the bid as made by the contractor (focused on price and planning); done by client	Based on the bid as made by the contractor (focused on price and planning); done by client	Based on the bid + customer satisfaction; done by client	Based on the bid + health of relationship; done by client and contractor	Based on the bid + health of relationship; done by client and contractor	Joint measures of success
PRICING						
Pricing Models & Incentives	Fixed price	Fixed price	Fixed price	Price based on actual expenses (regie)	Pricing model with shared risk and responsibility	P&L based equity sharing
GOVERNANCE						
Relationship Management	Monitoring of the contractor's promised planning and pricing	Monitoring of the contractor's promised planning and pricing	Regular monitoring on wider performance and pricing	Oversight emphasis, client leaves more responsibility to the contractor	Insight emphasis, client and contractor cooperate to achieve their project goals	Shared control and management
Exit Management	One way, limited commitment to buy	One way, termination for cause & convenience	One way, termination for cause & convenience	Performance based termination for cause with safeguards	Joint exit management plan	Divestiture
Compliance & Special Concerns	Market based	Market based	Market based	Tailored to project specifics	Jointly defined requirements	Investment based joint requirements

With the different formulation of the framework and the input from the interviews, a change in the application and usage of the framework will be proposed. No model is thought to be a perfect fit for any project, and customising the contract characteristics in such a way that it fits the project's specifics makes the phenomenon of cherry-picking inevitable. It can be concluded that the implementation of the SBM framework does have an influence on the cooperation between client and contractor, whether positive or negative, but not in the sense that a contract needs to follow the characteristics of one Sourcing Business Model; rather in the sense that certain combinations of characteristics within the SBM framework can create an environment in which the client and contractor can shape an optimal relationship that leads to the project's success.

Instead of regarding the SBM framework as a goal to be worked towards, it should be thought of as a starting point, a tool to critically assess what agreements the contract needs to contain. A contract facilitates an environment for discussion; even though there was a lot of cherry-picking between contract characteristics, there was room for discussion and cooperatively making decisions within all three case studies. The specific combination of contract characteristics that was chosen for these individual projects facilitated this cooperation, where especially the categories of 'economic model', 'relationship model' and 'relationship management' have the tendency to lean towards the relational side of the contract models. Even though other categories might lean more towards the transactional contracts, the conditions for the relationship are such that the cooperation between parties and the achievement of the project's objectives are not negatively affected. With the awareness that agreements within the contract should allow for freedom to shape the desired cooperation according to the project's objectives, the adapted SBM framework can guide in aligning the contractual agreements with the intended cooperation.

7.2 Validation of the research

The mapping of the contract against the SBM framework, but also the analysis of the cooperation between the client and contractor, has been done from three different perspectives: the client's perspective, the contractor's perspective, and the perspective from Witteveen+Bos as a third party. This increases the validity of the analyses, especially for corresponding statements. To validate the conclusions even further, other perspectives can be included (such as the perspectives of those who work with the day-to-day practice of the implementations), especially to get more insight into the origin of divergences between statements.

The adapted SBM framework has not been validated by the time this report is written, but an interview with the writers of the book 'Relationele contracten' (Jeroen van de Rijt and Wiebe Witteveen) has been scheduled to discuss the findings in this research. The results of this interview can be relevant for the SBM framework, especially because the statement of 'cooperation between client and contractor will be more successful with a strong adherence to one Sourcing Business Model' finds its origin in this literature. The findings of this interview will be presented during the colloquium of this study.

7.3 Limitations of the research

Due to the small sample size of analysed case studies, this research cannot be generalised to all the projects in the Dutch construction industry, especially considering the fact that only projects following two-phase contracts have been investigated. Besides, the three case studies are examples of projects that featured a successful cooperation within the bouwteam-phase, and the occasional discussions that did arise were not related to the implementation of the SBM framework. Whether unsuccessful projects would come to the same conclusion has not been analysed.

The alterations that were made to the SBM framework are not complete and require more validation; the various interviews did offer suggestions on how different models should be distinguished from one another but without considering contracts across the entire spectrum, other relevant insights might be missing. The difference between characteristics of transactional and relational models do generally

correspond with characteristics of traditional (DBB) contracts versus contracts featuring Early Contractor Involvement, respectively, but further specification was beyond the scope of this research.

Moreover, it needs to be realised that the SBM framework (both the original and the adapted one) is purely theoretical and perhaps not always realistic. This can be illustrated with application of the 'Vested' model, the most relational model: examples from contract types in the construction industry that fall within this category are alliances and DOEN-projects. Even though these projects are known for their successful results, their disadvantages are the high costs and the effort that is required to execute the project. They might seem to be the perfect solution for complex projects, but two interviewees have mentioned that it is less feasible and possibly even unrealistic to apply on a larger scale.

7.4 FUTURE RESEARCH

During the execution of this research paper, many findings and insights were obtained that were beyond the scope of the study but that can inspire future research. The concept of relational contracting is a novel one and even though the bouwteam-phases of the case studies were seen as successful, interviewees mentioned common themes that could stimulate further improvements and a higher degree of effectiveness in the bouwteam-phase. The recommendations for further research will be given in the two different ways to build upon the results as given in this report: by doing deeper research and by doing wider research.

7.4.1 SUGGESTIONS FOR DEEPER RESEARCH

The aim of doing deeper research is to find more evidence to support the results. One way to achieve this is by simply analysing more projects and interviewing more clients and contractors. Another way to achieve this is by interviewing more people related to one project: not only the client and the main contractor, but also subcontractors and team members within the project teams. This might give results that are more focused on the practical implementation of the agreements made in the contract.

This research now only focused on two-phase contracts, whilst the construction industry knows a wide range of contracts that has not been analysed. It is recommended to include other contract types in future research, such as DBB contracts, alliances, and D&C contracts, to assess whether contractual agreements and cherry-picking between characteristics has more of less influence on the cooperation than in the two-phase contracts that are considered now.

Finally, it needs to be realised that this research only covered contracts that were already made. To truly assess the influence of a contract following the characteristics of one Sourcing Business Model, it is recommended to use the SBM framework at the start of the preparation of the procurement process. A contract according to only one model can then be written and analysed on its influence on the achievement of the project objectives. This will reveal whether such approach is more of less successful compared to current practice.

7.4.2 SUGGESTIONS FOR WIDER RESEARCH

This section covers statements made by interviewees about contractual characteristics that are not included in the SBM framework, but that did affect the cooperation between involved parties and the project outcome. These statements are thought to be determining in the effectiveness of a bouwteam and might thus be of relevance when studying a rising concept such as relational contracting.

What all interviewees believed to be a crucial factor in the effectiveness of a bouwteam-phase was the composition of the team and the mindset of the team members. Several reasons were mentioned for this mindset not always being ideal: five out of six interviewees suggested that this could originate from team members not being used to working in such cooperative environments and still working with a traditional, transactional mindset, whereas two interviewees also mentioned the problem of organisations not being designed to allocating the effort that is required in a bouwteam-phase. It is recommended to not only investigate the influence of the mindset of the involved parties on the

cooperation in the bouwteam-phase, but to also analyse ways to get the mindset of the involved parties to a corresponding level.

Another recurring theme is the continuity of the cooperation, especially from the bouwteam-phase towards the execution phase. There was some controversy among interviewees about this continuity: some mentioned that the relationship established in the bouwteam-phase was continued towards the execution phase, whereas other interviewees noticed a stark difference between the cooperation in the bouwteam-phase and the execution phase. Despite their differences, these parties did indicate the importance of this continuity; one interviewee even suggested the use of an umbrella-agreement to preserve the cooperation as established in the bouwteam-phase. Retaining cooperation during the entire project and methods to ensure this continuity are topics of interest for future research.

Thus far, there is no standardised contract for the two-phase approach, but the desire for standardised contracts has been expressed by one interviewee. On the contrary, other interviewees have questioned whether this standardisation is a positive development, which they thought seems insensible given the unique nature of two-phase contracts. What ties into this topic is the matter of design freedom that the contractor gets: some contractors expressed the desire to get more freedom during the design phase because they believed that their expertise could bring a positive contribution to the design, whereas some clients did not deem this necessary and believed that their own knowledge was sufficient to make a proper design – they preferred to keep in control of the design. It is thus recommended to research whether standardisation, which would involve defining distinctive tasks and room for freedom for both client and contractor, is a logical step forward to make working in a bouwteam more effective, or whether it gets in the way of the bouwteam's most important feature: cooperation.

As a final remark, the suggestions that have been made for further research reveal that even though two-phase contracts already show successful and promising results, many improvements and nuances can still be researched to enhance their effectiveness. Clients and contractors are still exploring the concept of an ideal two-phase project and although perfect projects do not exist, this research and the proposed future research can give clients and contractors the insights that are needed to increase the added value of a two-phase approach to a project in its whole.

7.4.3 Generalisability of the research

The suggestions for deeper and wider research reveal that the results of this study can not yet be generalised to other disciplines. If these results were to be applied in a broader context, the adapted SBM framework would need to be tested for other contracts within the (Dutch) construction industry as well. This holds not only for other relational contracts, but also for transactional contracts and investment contracts. Only then can the influence of the alterations be analysed within the context of other disciplines as well, such as health care, the social domain and facility management. Up until that point, the results of this study can serve as a starting point and source of inspiration for researchers and practitioners of this theory.

8 CONCLUSION

The objective of this research was to analyse how the agreements made in a contract influence the achievement of the project objectives and how the SBM framework, as proposed in literature, can be implemented by Witteveen+Bos in the preparation of the procurement process within the Dutch construction industry. To achieve this objective, the contracts of three case studies are mapped against the aforementioned SBM framework (RQ 1.1). This was followed by interviews with both the clients and the contractors of the projects to clarify the project's objectives (RQ 1.2), the intended degree of cooperation (RQ 1.3), and their perspective on how the cooperation between client and contractor is influenced by the choices made in the contract characteristics (RQ 1.4). The results were used to answer what degree of adherence to the SBM framework is required to achieve the cooperation goals and thus the project objectives for that specific project (RQ 1.5). The answers to these questions for each project, compared to the statements made in literature, determine the applicability of the SBM framework to the Dutch construction industry (RQ 2). Collectively, these questions answer the main research question: "considering the application of the Sourcing Business Model theory, how do choices made in the contract characteristics influence the cooperation between the client and the contractor and thus the achievement of the project objectives?"

Analysis of the case studies revealed that the contracts do not follow the characteristics of only one Sourcing Business Model, but that agreements in the contract follow a combination of characteristics of multiple Models; a phenomenon that is also defined as 'cherry-picking'. Even though the behaviour of cherry-picking is discouraged in literature, clients and contractors did not find that this negatively affected the cooperation in their projects. This can be explained by the fact that involved clients and contractors found freedom within the agreements to deviate from the contract in situations where this benefited the cooperation and the achievement of the project's objectives. Additionally, the original framework featured some categories that were not applicable to the construction industry. For that reason, an adapted framework as displayed in Table 11 is proposed, which is specifically targeted to the construction industry.

Not only is a different lay-out of the framework proposed, but also a different implementation of the framework during the preparation of procurement process, guided by consulting companies such as Witteveen+Bos. Instead of aiming for a contract that follows the characteristics of one single model, the framework should be regarded as a starting point for making agreements. Combining characteristics of multiple Sourcing Business Models that are tailored to the project's specifics benefits the cooperation between the client and contractor and determines the success in achieving the project's objectives, rather than a strict adherence to the characteristics of one Sourcing Business Model. Through the awareness that the contract facilitates an environment to shape the desired cooperation, the client and contractor can set conditions for said cooperation to achieve the best project result. The adapted SBM framework then serves as a means to give insight in the wide range of contractual characteristics that can be chosen from, rather than a goal to be worked towards. After all, the construction industry is way too complex to be reduced to only seven contract models.

Table 11 - Suggested SBM framework (adapted)

	Transactional (market)			Relational (hybrid)		Investment (hierarchy)
	Basic provider	**Approved provider**	**Preferred provider**	**Performance-based**	**Vested**	**Investment**
BUSINESS MODEL						
Economic model	Transaction based (per activity), no preselection of contractors	Transaction based (per activity), a few selected contractors can bid	Transaction based (per activity), client has chosen one preferred contractor	Output based, focused on project result	Outcome based, focused on project result and consequences for the environment	Transactional, output or outcome based
Relationship model	No collaboration, clear distinction between client and contractor	No collaboration, but potential for repeat future business	Emerging collaboration, WIIFWe-approach.	Collaborative, exchange of expertise, win-win approach	Highly collaborative, less distinction between traditional client-contractor roles	Investment based
Vision & Intent	Focused on lowest price for a bid	Use of framework agreement	Aimed to achieving Best Value	High focus on project performance, rather than on lowest price	Client and contractor formulate a mutual vision, which they are collaboratively pursuing	Sustainable value
SCOPE OF WORK						
Statement of Work & Objectives	"Who" and/or "how" (client determines who will execute his tasks)	"Who" and/or "how" (client determines who will execute his tasks)	"Who" and/or "how" with jointly defined "how"	"What" limited emphasis on "how" (client indicates the desired result, is less involved in how this is achieved)	"What" (client indicates the desired outcome and relies on the expertise of the contractor to determine the "how")	"What if", "what for" and "when"
PERFORMANCE MANAGEMENT						
Performance Focus	Does the project meet the requirements?	Does the project meet the requirements?	Does the project meet the requirements?	Is the desired output achieved?	Is the desired outcome achieved?	P&L based measures
Performance Measures	Based on the bid as made by the contractor (focused on price and planning); done by client	Based on the bid as made by the contractor (focused on price and planning); done by client	Based on the bid + customer satisfaction; done by client	Based on the bid + health of relationship; done by client and contractor	Based on the bid + health of relationship; done by client and contractor	Joint measures of success
PRICING						
Pricing Models & Incentives	Fixed price	Fixed price	Fixed price	Price based on actual expenses (regie)	Pricing model with shared risk and responsibility	P&L based equity sharing
GOVERNANCE						
Relationship Management	Monitoring of the contractor's promised planning and pricing	Monitoring of the contractor's promised planning and pricing	Regular monitoring on wider performance and pricing	Oversight emphasis, client leaves more responsibility to the contractor	Insight emphasis, client and contractor cooperate to achieve their project goals	Shared control and management
Exit Management	One way, termination for cause & convenience	One way, termination for cause & convenience	One way, termination for cause & convenience	Termination for cause & convenience with safeguards, serious effort to sustain the relation must be shown	Joint exit management plan	Divestiture
Compliance & Special Concerns	Market based	Market based	Market based	Tailored to project specifics	Jointly defined requirements	Investment based joint requirements

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Appendix 1 – Elaboration on the seven Sourcing Business Models

This section will give a more elaborate explanation of every Sourcing Business Model as proposed by Vitasek et al. (2016), based upon the following set of rules:

1. Business model (what does the economical model look like, how can the relationship between parties be described and what is the vision/intention of the business model?);
2. Scope of the work (how is the Statement of Work designed and what is the goal of every party? Is the client focused on how the contractor delivers his work, what he delivers or what the effect of his work is?);
3. Performance management (which type of performance is expected and how is this being measured: a Key Performance Indicator (KPI) on how the job has been done, on service level or on the outcome?);
4. Pricing (is the work of the contractor priced per activity, for the performance, or for achieving the desired effects? Does the client work with rewards and penalties?);
5. Governance (how are relations governed, is there a potential for improvement and innovation, how is exit management designed, and how can compliance be assured?).

This set of rules allows the seven Sourcing Business Models to be distinguished from each other in such a way that they fall within the continuum of Figure 11:

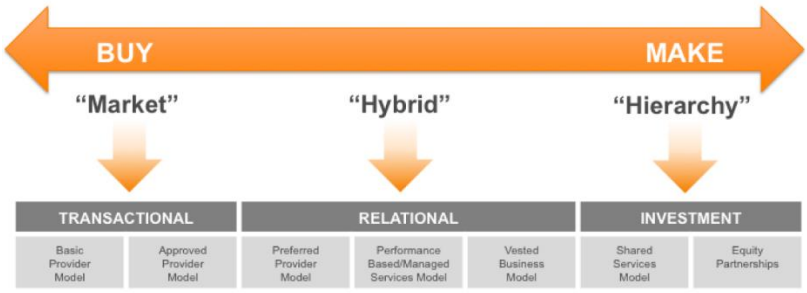

Figure 11 - Make-or-buy continuum (Vitasek et al., 2016)

Basic provider model (transactional)

The first model, which can be found on the left-hand side of the 'make-or-buy' spectrum, describes a relationship between two parties that is purely transactional. The model is very straightforward and without many negotiations: there is a homogeneous product, offered by many providers. Every transaction is regarded as an individual one, where the client will choose the provider based on the lowest price for the highest quality. When the transaction has been completed and the product or service has been provided, the relationship between provider and client is over.

Approved provider model (transactional)

The approved provider model has, as the name suggests, quite a few characteristics from the basic provider model. The main difference between the two, however, is that the client can now choose between a selection of a few approved providers (selected by himself). The product or service is still regarded as homogeneous, but the client already knows that the providers he can choose from offer sufficient quality. The main advantage of this model is the room for negotiations, such as agreements about volume discounts. This is where the so-called 'blanket purchase orders' are introduced, agreements about providing products or services on a recurring base at a fixed price.

Preferred provider model (transactional)

The first relational model has its basis in the transactional models, namely that the client is looking for someone who can provide him with the products or services he is asking for. The reason why the preferred provider model is a relational one, however, is because of the fact that the client has decided

to choose for one specific provider. This provider will be able to immerse himself into the client; he knows, after all, that the client will stay with him. Both parties can now actively work on improvement and innovation together and strive for a win-win situation. An example of this model in the civil engineering industry is the so-called two-phase contract, where all parties are concerned with the design of the project (phase 1) and subsequently decide how this will be realised (phase 2) (Van de Rijt & Witteveen, 2021).

Performance Based/Managed Services Model (relational)

Where the previous models all featured a client who knew how he wanted his products and services to be delivered, this performance-based model is the first one that lets the client define only what he wants to be provided with, allowing the provider to determine how he is going to achieve this. The relationship is output-oriented; the provider has performed his duty when he can provide the client with what he had asked for – how he does this is not up to the client to decide. What is typically seen in this type of contract is that the client transfers the risks to the provider, whereas the provider tries to get the most monetary gain for taking over these risks. An example of this model is a Design & Construct (D&C) contract (Van de Rijt & Witteveen, 2021).

Outcome-based model/Vested Business Model (relational)

The final relational model is an outcome-based model, or Vested business model. This model requires the highest collaboration between client and provider, where there is no clear distinction between what the client does and what the provider does. The focus is on the consequences of the activities of both client and contractor, not specifically on the actions themselves. Together, both parties work on their desired outcome, simultaneously transcending purely organisational goals. Both parties have shared objectives (although driven by different interests) and a shared responsibility, which translates into equally sharing all profits and losses. This model is often chosen for bigger, multi-dimensional projects, where risks cannot be mapped out beforehand.

Shared Services Model (investment)

The investment models are typically on the 'make'-side of the spectrum, indicating that a company chooses to produce a product or service in-house. When companies want to centralise part of their tasks to maximise efficiency, they can employ a Shared Service Centre (SSC): a semi-autonomous unit responsible for (a couple of) operational tasks within a company. This unit can be seen as a 'preferred provider', but an obligatory one that is part of the company. This SSC does not have the aim of making a profit but serves as the expert of a company focused on reaching the company's goal.

Equity Partnership Model (investment)

Not always does a company have the means to establish an SSC, but they do have an interest to be active in a certain field. In these cases, an Equity Partnership Model might be the right way to go. An example is a joint venture with a provider or a share in the provider's company. The client now still has significant control over the process and the risks will be shared between both parties.

APPENDIX 2 – ELABORATION DESKTOP STUDY, PROJECT 1

The choices made in mapping the characteristics of the contract for the EHT (project 1) will briefly be elaborated in this section, for each category within the SBM framework.

Economic model

Choice of Sourcing Business Model: Vested

The project of the EHT is not only specified on the renovation of the tunnel, but also on the development of the 3BT-bouwblok and its application in other projects. The focus of the client is not only on the result of this particular project, but he realises that the results of this project matter in future projects as well. Besides, Rijkswaterstaat acknowledges the impact this tunnel has on its environment and stakeholders and is thus not only focused on the output of the project, but rather on its outcome.

Relationship model

Choice of Sourcing Business Model: performance-based

Already stated in their ITT, Rijkswaterstaat aims for Early Contractor Involvement and the use of the contractor's expertise to further work out the project's objectives. This requires close collaboration between client and contractor: they formulate the activities to be done together. It does not yet fully embrace the WIIFWe-mindset, however, since RWS still has still prescribed a vast majority of the activities and responsibilities for the contractor without their input.

Vision & intent

Choice of Sourcing Business Model: preferred provider

The ITT bases the awarding of a bid to the contractor that scores best on the BPKV-criteria. With this approach, RWS tries to achieve the Best Value for this project.

Scope of work

Choice of Sourcing Business Model: approved provider

With the publishment of the ITT, Rijkswaterstaat had a clear formulation of the activities they wanted to be executed and they were looking for a contractor who could do this. Even though the project description emphasizes the need of a collaboration between both parties, Rijkswaterstaat still holds the strings and has defined the tasks they want the contractor to perform in order to achieve their desired objectives.

Performance focus

Choice of Sourcing Business Model: preferred provider

The client has formulated certain activities for the contractor to execute, and the operational performance is thus measured based on these prescribed activities.

Performance measures

Choice of Sourcing Business Model: performance-based

Besides measuring the performance based on the operational aspects, the relationship between parties is closely monitored and measured as well. The client believes that the best outcomes are achieved with good cooperation between client and contractor and to ensure good collaboration, requirements for measuring the cooperation are established in the contract.

Pricing models & incentives

Choice of Sourcing Business Model: preferred provider

The contractor gets a compensation consisting of a fixed price (based on the tasks and products as defined for the renovation phase) and a variable price (based on the spent hours in the bouwteam-

phase). There is a penalty scheme, that includes a deduction on the total sum if the contractor does not comply to the BPKV-criteria, but there are no incentives to gain for contractor.

Relationship management

Choice of Sourcing Business Model: Vested

With designing the contract, the client is aware that the relationship with the contractor is crucial for the project to be successful. Collaboration is the most important criterion in the BPKV-criteria and formal rules are established about the communication protocol and the decision-making process. The client wants to maintain a healthy relationship with this approach.

Improve, transform & innovate

Choice of Sourcing Business Model: Vested

With the desire to develop the 3BT-bouwblok, RWS has already identified the innovation they would like to see realised. In the bouwteam-phase, they will further specify the realisation of this innovation jointly with the contractor.

Exit management

Choice of Sourcing Business Model: performance-based

The contract refers to ARVODI-2018 for the standard termination clauses, but has an extra line added that states that in the case of a conflict, both parties have four weeks to come to a solution without intervention of a legal institute.

Compliance & special concerns

Choice of Sourcing Business Model: performance-based

In order for contractors to have the winning bid, they need to comply and excel on the predefined BPKV-criteria. These criteria are designed for this project specifically; the project is of such complexity that tailored compliances are a necessity.

APPENDIX 3 – ELABORATION DESKTOP STUDY, PROJECT 2

The choices made in mapping the characteristics of the contract for DNZN (project 2) will briefly be elaborated in this section, for each category within the SBM framework.

Economic model

Choice of Sourcing Business Model: Vested

The goal of the bouwteam-phase is to obtain the contractor's knowledge about the execution, not necessarily about the design tasks themselves. Besides, this project is part of the programme 'Oranje Loper', which requires a certain degree of coordination between the projects that are part of this programme. The focus of the project is thus not only on its own output, but on the consequences on the environment and related projects as well (outcome based).

Relationship model

Choice of Sourcing Business Model: performance-based

In legal terms, the client and contractor are still separated from one another. They work closely together, but there is no fusion between the parties into one party that shares both risk and reward. The client eventually pays for the project, which indicates the distinction in responsibilities between client and contractor.

Vision & intent

Choice of Sourcing Business Model: performance-based

The mission statement that was collaboratively agreed upon describes the relationship that both client and contractor commit to, but has no financial implications. There is still a distinction between the interests of both parties in terms of money, and no strategic desired outcomes are formulated. On the other hand, the focus is not solely on price (there is no distinct Best Value approach) but is more related to the performance that the contractor can deliver.

Scope of work

Choice of Sourcing Business Model: preferred provider

The client required the expertise of the contractor for the execution of the project and made the designs (Preliminary Design and Final Design) himself, with the contractor in a reviewing and advising position. The implication of the client making the designs is that many choices were already set in stone, leaving the contractor with the task to further develop this to the execution phase. The client has already defined what needs to be done and decides in cooperation with the contractor how this will be developed further.

Performance focus

Choice of Sourcing Business Model: Vested

The contract states that the quality is being measured based on the internal quality-management system of the contractor. The focus here is not only on the technical aspects, but naturally also on the price, risk management, and the environment (for instance with guidelines of a BLVC-plan). This is a natural cause of the choice of economic model.

Performance measures

Choice of Sourcing Business Model: performance-based

Whereas the quality is naturally measured on the operational tasks, there is an additional dimension in terms of performance measures on the relationship. The relationship is closely managed with help of an Engager-app, and performance is measured by periodic questionnaires for both the client and the contractor about communication, availability, and collaboration, amongst others.

Pricing models & incentives

Choice of Sourcing Business Model: preferred provider

The contractor is being paid in the bouwteam-phase based on a fixed hourly rate, without any incentives or penalty scheme. The only incentive for the contractor is the prospect of participating in the execution phase.

Relationship management

Choice of Sourcing Business Model: Vested

Because of the nature of a bouwteam-phase, the relationship between client and contractor is very strong and closely monitored, to use the strengths of both parties for obtaining the best result for the project.

Improve, transform & innovate

Choice of Sourcing Business Model: basic provider

There was no need in this project for major innovations or progressive technologies. No transformative requirements were asked for.

Exit management

Choice of Sourcing Business Model: performance-based

Besides the standard rules and regulations in terms of exit management, this project introduced so-called escalation levels that would play a role if the discussions exceeded the scope of the contract managers. The use of these escalation levels is to allow the project team to solve potential problems within the team itself, without legal implications.

Compliance & special concerns

Choice of Sourcing Business Model: performance-based

The complexity of the project resulted in the contractor needing to comply to tailored requirements, as is usual for projects of this scope.

APPENDIX 4 – ELABORATION DESKTOP STUDY, PROJECT 3

The choices made in mapping the characteristics of the contract for the NMB (project 3) will briefly be elaborated in this section, for each category within the SBM framework.

Economic model

Choice of Sourcing Business Model: performance-based

The primary focus of the bouwteam-phase is to combine the knowledge of the client (and his advisor) with the knowledge of the contractor about the materials of the bridge deck itself, and is thus merely focused on the output of the project and less on the outcome (especially compared to project 1 and 2).

Relationship model

Choice of Sourcing Business Model: performance-based

Both client and contractor agreed on a close cooperation to combine their expertise, but they are still separated in a legal sense. The tasks make clear who is responsible for what, and there is no task where they combine forces as one party to execute that task.

Vision & intent

Choice of Sourcing Business Model: preferred provider

As stated in the Instruction To Tenderers (ITT), one of the criteria that the bids will be scored upon is 'the degree to which maximum value within the budget can be reached'. This implies a Best Value approach, which has the same characteristics.

Scope of work

Choice of Sourcing Business Model: performance-based

The initial plan for this project was to design the bridge deck based on the conditions of UAV-GC, which would entail that the contractor was mostly responsible for the design. This plan then changed to a bouwteam-phase which gave less freedom (and responsibility) to the contractor, but some elements of the original UAV-GC approach are still reflected in the contract. One of these elements is the freedom that the contractor gets for designing the composite deck, something he has most knowledge about. The client defines the 'what' (design a composite deck), and the contractor defines how this will be executed.

Performance focus

Choice of Sourcing Business Model: performance-based

Resulting from the choices made for the 'scope of work', the client's focus on the performance is on output level and less on detailed task descriptions, simply because these have not been made.

Performance measures

Choice of Sourcing Business Model: performance-based

As per usual, the operational tasks are measured on the performance, but because the cooperation between client and contractor is one of the base principles of a bouwteam-phase, there were regular meetings between the two parties to discuss the collaboration within the project teams and adjust strategy if necessary.

Pricing models & incentives

Choice of Sourcing Business Model: preferred provider

With the submission of his bid, the contractor proposed a set price for which he thought he could participate in the bouwteam-phase, and he is being paid in periods of four weeks based on this fixed price. There are no incentives or penalties included in the contract: the only incentive for the contractor is the prospect of participating in the execution phase.

Relationship management

Choice of Sourcing Business Model: Vested

The bouwteam-phase naturally requires a strong collaboration between the two parties and many responsibilities are for both parties in the bouwteam, instead of one party bearing the sole responsibility.

Improve, transform & innovate

Choice of Sourcing Business Model: approved provider

There are some mentions in the contract where the client asks the contractor to implement 'innovative solutions', but does not specify the degree of innovation, the way this is being measured or the implications that the innovation should have. It is therefore mainly market driven.

Exit management

Choice of Sourcing Business Model: performance-based

Both parties can terminate the contract when this is required, but they are naturally expected to put effort in collaboratively finding solutions and solving potential conflicts.

Compliance & special concerns

Choice of Sourcing Business Model: performance-based

Just as with project 1 and 2, the contractor should comply to tailored requirements, due to the complexity and scope of the project.

APPENDIX 5 – TRANSCRIPTS INTERVIEWS

The transcripts of the interviews and the comparison between the answers of the respective client and contractor are included in a separate (confidential) document. Access to this document can be requested by contacting the author of this bachelor thesis.

APPENDIX 6 – TABULATED ANALYSIS INTERVIEWS

This section will give an overview of which interviewee made which statement, hereby giving insight into the consensus and disagreement there was on the various topics. A distinction between three topics has been made: statements related to answering the research questions, statements related to the applicability of the SBM framework to the construction industry and remaining statements that were beyond the scope of this research, but that were significant for the bouwteam-phase nonetheless. A '+' in Table 12 indicates agreement to the statement, and a '-' indicates disagreement to the statement.

Table 12 - Statements made by each interviewee

Topic	Statements	Interview references					
		IN1	IN2	IN3	IN4	IN5	IN6
	Research Question related						
RQ 1.1	Contracts are rarely implemented in practice precisely as prescribed.	+	+	+	+	+	
Aim of two-phase contract (RQ 1.2, 1.3)	The aim of using a two-phase contract is to gain time.	+			+		
	The aim of using a two-phase contract is to exchange knowledge.	+	+	+	+	+	+
	The aim of using a two-phase contract is to collaboratively determine a fair price for the execution phase.	+	+		+		+
	The aim of using a two-phase contract is to determine a fair distribution of risks.	+	+		+		+
RQ 1.4	Tailored contracts and cherry-picking between contract models benefit the cooperation between client and contractor.	+		+	+	+	+
RQ 1.5	The SBM framework can be seen as a means to achieve the project's objectives, the adherence to one Sourcing Business Model should not be seen as a goal in itself.	+				+	
	SBM framework related (RQ 2)						
Vested models	Vested models are known for the lack of distinction between the traditional client-contractor roles.	+					
Performance-management	The performance of the contractor is being measured based on the price in the contractor's bid.	+				+	
	The performance of the contractor is being measured based on the planning in the contractor's bid.			+	+	+	+
	The performance of the contractor is being measured based on the BLVC-criteria in the contractor's bid.				+		
Pricing	The use of incentives and penalties have a negative influence on the delivered quality.	+	+	+	+	+	+
	The use of incentives and penalties have a negative influence on the motivation to cooperate.						+
Relationship management	The relationship and collaboration between client and contractor are actively being monitored in the project.	+	+	+	+	+	+
Improve, transform & innovate	A necessity for close collaboration does not imply a higher degree of innovation within the project.			+	+	+	+
	Further research						
Vested models in practice	Projects following the Vested model are idealistic and often unrealistic or not feasible.	+	+				
Continuity of cooperation	The cooperation in the bouwteam-phase continues to the execution phase.		-	+		-	+
Composition team	The composition of the team determines the success and effectiveness of the bouwteam-phase.	+	+	+	+	+	+

Mindset team members	Team members' traditional mindset obstructs the cooperation between parties.	+	+		+	+	+
Mindset organisations	Organisations are not yet fully aware of the effort that collaboration in a bouwteam requires, and the lack of effort obstructs the bouwteam's effectiveness.			+	+		
Standardisation	Standardisation would be a good development for two-phase contracts.	+	-	-			
Freedom contractor	A bouwteam can be more effective if the contractor gets more freedom than the contract currently allows for.	-	+	-			+