COLLABORATIVE PROCUREMENT IN THE CONSTRUCTION SECTOR

A DESIGN TO INCREASE THE POTENTIAL OF A COLLABORATIVE RELATIONSHIP BETWEEN CLIENT & CONTRACTOR

MASTER THESIS - ANNE DE JAGER

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Colophon

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Preface

This report is the result of my graduation research which was carried out for the master program of Construction Management & Engineering at the TU Delft. By means of this research I have managed to complete my study successfully, which I am proud to announce.

During the time I spend in lectures I became acquainted with the complex practises of construction procurement. However, mainly my experience on the building site has led my interest to point out to the paradox between collaboration and the current procurement practises. For this reason, I have dedicated this research to explore possible solutions overcoming this paradox.

The time at my graduation firm, Twynstra Gudde, gave me the chance become further informed with the procurement practises and sharpen the demarcation of this research. Furthermore, the experts at Twynstra Gudde gave me direction to the practical relevancy of the research topic, of which I am confident, added to the value of this research.

I would like to express my gratitude to everyone that made this research possible. To start, I would like thank my colleges at Twynstra Gudde for providing the opportunity to conduct this research and having a great time doing so. Furthermore, I would like to thank my graduation committee at the TU Delft, Marleen Hermans, Leentje Volker and Leon Hombergen for providing me with the tools and necessary critism to perform this research. I would like to thank Dik van Manen as well, for giving his constructive feedback, needed to guarantee the overall value, correctness and completeness of the research. A special thanks goes out to Roel Reuser for being so enthusiastic and motivating throughout the course of this research, and for the great amount time that you put into the shaping and execution of this research.

Last but not least, I would like to thank everyone that participated in the research.

The only thing that remains is for me to wish you a pleasant read,

Anne de Jager
Delft, December 2016

Executive Summary

Introduction

There are multiple requirements to a successful construction process, a collaborative client-contractor relationship being one of them. Collaboration has proven to positively influence the qualitative performance and decrease the costs and duration of the project.

The client-contractor relationship starts during the procurement procedure. Procurement is the process of finding a suitable contractor for the execution of a desired product, delivery or service, finalized in a contractual agreement. Products, deliveries and services exceeding the European threshold, are required to be procured following the regulations of the European Procurement Directive. This directive obliges to guarantee competition, non-discrimination and transparency throughout the procedure.

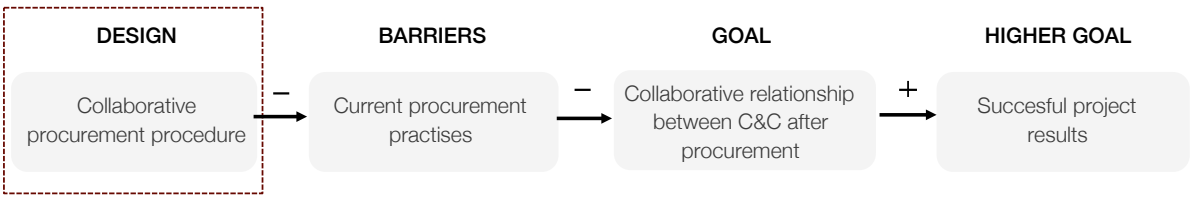
Problem Definition

The European Procurement Directive, the conservative culture within the construction sector and past events which have put pressure on the sector, have led to the existing procurement practises. In these practises, the client and contractor (C&C) are stuck in a culture in which the use of strategic behaviour, like unreasonable pricing or withholding of relevant information is no exception. This behaviour leads to a feeling of mistrust triggering more dishonest behaviour. These practises have started a vicious circle which is very challenging to escape. Additionally, this culture continues to facilitate formal and risk-adverse behaviour during the tender procedure and a persistent use of traditional forms of procurement. Consequently, the current procurement practises often result in the development of adversarial relationships rather than collaborative relationships. This paradigm is translated in the following problem definition;

The current procurement practises create barriers for the development of a collaborative relationship between C&C after procurement

Research objective & research question

There is a growing need for collaborative relations in the constructions sector, to comply with integrated or life-cycle contracts covering projects with a long duration and a high complexity. The concept of collaborative procurement, aiming to increase collaboration between C&C throughout the procurement procedure, has been introduced in a few researches. However, most of these researches are directed towards the problem and lack insight into possible solutions. Therefore, the goal of this research is to provide a design for a collaborative procurement procedure that increases the potential of a collaborative relation between C&C after procurement. This design will be developed to limit the barriers for collaboration, that occur during the current procurement practises. Consequently, this design will contribute to the increase of the potential of a collaborative relation between C&C. Finally, this improvement is perceived to have a positive influence on project results.



The scope of the design is directed to the formulation of process measures that can be used to construct a collaborative procurement procedure, applicable for procurement within the construction sector, exceeding the European threshold. The following research question is answered;

How can the potential of a collaborative relation between client and contractor be increased throughout the procurement procedure of a construction process?

Execution of the research

Before creating the design, the design starting point, -restrictions and -requirements are addressed in an analysis and diagnoses phase. In this phase, a literature study was conducted on the available procurement procedures, the restrictions described in the European Procurement Directive and the existing problem within the current practises. Thereafter, the research input was gathered by means of four focus groups, each existing of three to four procurement experts. Lastly, this input was evaluated by an expert panel, composed out of six participants from the focus groups.

Analysis and diagnosis

A procurement procedure that is directed to increase the potential of collaboration, should be constructed within the procedures described in the European Procurement Directive, following the provided regulations. The basis of a procurement process is determined by the Open- and Restricted Procurement Procedure and can be extended with dialogue- or negotiation rounds. Additionally, the principles within procurement law define certain implications to a collaborative procurement procedure. The most essential implications are; a continuous guarantee of a level playing-field and the restriction to make essential changes to the contract, during or after the procurement procedure.

Comparison of multiple researches concentrated to the defined problem definition, has resulted in the identification of seven barriers, that obstruct the potential of collaboration during the procurement procedure;

(1) A persistent focus on own objectives, based on economical drivers;
(2) A lack of commitment to the project and mutual specification of the project;
(3) A feeling of inequality between the involved parties;
(4) An unclear definition of the partnering objective;
(5) No relational fit between the parties (and no selection on this aspect);
(6) No selection on collaborative competences;
(7) A lack in expertise within the teams to perform a collaborative procurement procedure.

Design input

During the focus groups, brainstorming sessions were held to formulate measures that would limit the identified barriers. However, the results cover more general measures as well, as the participants were aware of the goal of the research. Based on a clustering of all formulated measures, seven design themes are identified. These themes define the most relevant topics that should be invested in during a collaborative procurement procedure. Within this clustering, a distinction is made between fundamental themes and directed themes.

The fundamental themes have an indirect contribution to a collaborative procurement procedure but are essential to make a collaborative procurement procedure work. Furthermore, investment in these themes can help to address the other themes. This fundamental themes include;

(1) Honest, reasonable and convincing behaviour
This theme underscores the fact that a collaboration starts with ‘honest work for an honest price’. Setting a fair price range, actively demotivating withholding of information, and considerable weights on relational criteria are required to make a collaborative procurement procedure work.

(2) The creation of a more informal atmosphere
The formal and legalistic environment within the procurement procedure obstructs a process in which parties can trust each other and behave authentically. Facilitation of an informal contact route, training or limitation of juridical actors can contribute to the creation of a more informal atmosphere.

(3) Relationship building
Investment in creating more interaction, providing informal excursions and focus on the perspective and underlying thoughts of the opposite party is valuable to a solid fundament of the procedure. A collaborative procedure can work considerably better when parties know and understand each other.

The directed themes are focussed to the limitation of one or more of the barriers, and give direction to the steps of a procurement procedure. Therefore, these themes actively facilitate a certain element of collaboration.

(1) *Alignment of the contract & desired relationship*
To increase the level of trust and feeling of equality among the actors, the contract conditions like risk allocation, foundation of the price or definition of the remuneration scheme, should be discussed more transparently during the tender procedure. Furthermore, the absence of the incentive to win on lowest price creates room to award on other criteria, which can be used to define the future relationship. This theme is perceived to limit persistent barriers like unbalanced compensation or transfer of unmanageable risk (barrier 1 & 3).

(2) *Co-creation of the project*
Formulation of open contract specifications offers the possibility for contractors to come up with smart solutions. Investment in active involvement of the contactors in the specification of the project, or co-creation of the project, contributes to the contractor's commitment towards the project and feeling of acknowledgement (barrier 2). Finding opportunities for the contractors can contribute to this topic as well.

(3) *Definition of the partnership*
The definition of a substantive partnering objective, or collective shaping of a partnership, are essential to give meaning to the collaboration. This investment is helpful to create a well-working and committed partnership (barrier 4).

(4) *Composition of a team based on relation fit & -competences*
Investment in selection and training based on team-assessments focussed on soft competences and chemistry between C&C can create a valuable contribution to a well-working future team (barrier 5 & 6). This relational focus contributes to the 'soft expertise' of the parties as well (barrier 7).

Evaluation
The potential of the themes is evaluated by an expert panel based on three criteria; effectivity (towards the formulated goal), feasibility and preference.

The overall effectivity of each theme is highly valued. The expert panel has underscored the fact that investment in a collaborative procurement procedure should always start by the limitation of the most persisting barriers within the current practises; distrust between the client & contractor and strategic behaviour. Furthermore, the panel recommends the use of more facilitating measures, which are named in the directed themes, if you really want to launch a collaborative relationship. Addressing the fundamental themes is essential, but has a very indirect contribution to the facilitation of collaboration.

Feasibility concerns are mostly directed towards the required investment, existing culture and implementation in procurement law. Mostly the last topic is complex, as there exist a blurred line between the impossibilities within procurement law and the unrightfully perceived limitations of procurement law. Better recognition of this line and a good preparation concerning issues like information asymmetry, objective motivation and contract change are essential. Concerning preference, investment in the full range of fundamental and directed themes is positively assessed by the expert panel to be used within a collaborative procurement procedure. However, it is accentuated that it is required to make choices when making an investment.

Research results

Based on the results of the literature study, the focus groups and the expert panel, a design is developed that provides all choices that can be made in a collaborative procurement procedure. The seven themes derived in the execution phase form the building stones. This design is described in chapter 6. Following, the overall conclusions of the research are provided, thereby answering the research question.

Conclusion

This research has identified multiple measures that can be utilized to enhance collaboration throughout the procurement procedure. Overall it is concluded that this enhancement entails two main requirements.

First, the chance of future conflicts developing between C&C should be limited, as these conflicts directly ruin the potential of collaboration. In the current practises, these conflicts mostly derive from strategic behaviour caused by the definition and acceptation of unreasonable conditions like transfer of unmanageable risks or unreasonable expectations concerning the quality that is delivered for a certain price.

It should be emphasized that contract conditions like risk allocation, remuneration scheme, price range and contract specifications, are set by the client before the procurement procedure starts. This research gives insight in the fact that a collaborative procurement procedure should use the opportunity to talk about these conditions more frequently. A real change can be made when these conditions are not seen as a fixed fact, but a topic that is collectively and transparently discussed and defined within the procedure. This opportunity can improve the level of trust between C&C and demotivate strategic behaviour.

Secondly, the procurement procedure should facilitate a process that actively addresses elements that are necessary for a collaborative relationship, which is beyond the technocratic and conservative culture within the construction sector. To actively enhance the potential of collaboration, the client should pursue the opportunity to involve the contractors in the development of the project throughout the tender. Furthermore, the procurement procedure facilitates the opportunity for the client to connect with the contractors, which in a collaboration-focussed procedure, should be used to talk about relational topics that define the future partnership. Complementary, the selection- and award criteria should be used to evaluate the contractors based on relational proposals, collaborative competences or chemistry.

Overall, it is concluded that the opportunities to enhance collaboration throughout the procurement procedure are there. However, the extent to which investment in this opportunities is actually made is limited, as the profit gained by this investment is always uncertain. While the post-procurement phase offers a more convenient way to enhance collaboration, current practises show that by then, it is already too late. Therefore, the most essential aspect to enable change in the current practises is the recognition of the necessity to invest in collaboration throughout the procurement procedure. A convincing attitude is required when constructing and executing a collaborative procurement procedure, as an apparent contrast should be made with the current practises and existing culture.

In constructing a collaborative procurement procedure, the following principles are recommended;

1. A collaborative procurement procedure starts by investing in the motivation of trust and demotivation of strategic behaviour.
2. The construction of a collaborative procurement procedure requires a fundament to enable the procedure to work and more facilitative measures to directly enlarge the potential of collaboration. Investment should be made in the fundamental and directed themes described in the design input.
3. Collaborative procurement can be performed by a wide range of options. For an effective and feasible procedure, founded selection is required based on the characteristics of the project and wish of the client.
4. The construction of a collaborative procurement procedure should be embedded in the existing procedures, and therefore requires dealing with the comprehensiveness to combine qualitative-, financial- and relational criteria. Additionally, the procedure requires good preparation to guarantee the principles of the European Procurement Directive.
5. A daring and future-focussed behaviour is vital to make a collaborative procurement procedure work. This starts by constructing a congruent, on collaboration focused procedure, in which openness and recognition of the other party is central.

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Abbreviations

BVP	Best Value Procurement
C&C	Client & Contractor
CV	Curriculum Vitae
CSF	Critical Success Factor
FPS	Field Problem Solving
KPI	Key Performance Indicators
MEAT	Most Economical Advantageous Tender
PIPS	Performance Information Procurement System
PPP	Public Private Partnership

PART ONE
INTRODUCTION

1. Introduction to the subject

There are multiple requirements to a successful construction process, a collaborative client-contractor relationship being one of them. This relationship starts during the procurement procedure. Consequently, this procedure has an extensive effect on the development of this relation.

However, the public procurement practises are influenced by the implications of both the European Procurement Directive and the conventional culture in the construction industry. These implications, combined with the pressure that was put on the market during the building crises, has led to corruptive- and strategic behaviour during the procurement procedures, damaging the level of trust between the parties. These practises have started a vicious circle which is very challenging to escape. Additionally, this culture of distrust continues to facilitate formal and risk-adverse behaviour and a persistent use of traditional forms of procurement, which do not motivate collaboration. Consequently, the current procurement practises create barriers to develop a collaborative relationship between the client and contractor. The necessity to change this practises can be seen within the 'Marktvisie', an initiative that gathers all parties within the construction sector to actively improve the level of collaboration, respect and equality among actors, to comply with the increasing complexity in the sector (Rijkswaterstaat, 2016a).

Therefore, this research aims to identify how the procurement procedure can be constructed to change the current practises and enlarge the potential of collaboration between the client & contractor during the construction process. In this chapter the subjects of collaboration and procurement are introduced. Thereafter, the problem analysis is described. Finally, the window of opportunity, collaborative procurement, is introduced, going into the applicability of this concept.

1.1. Collaboration within the Construction sector

Although a collaborative relationship between the project's client and -contractor cannot guarantee a positive project outcome, several researches have shown collaboration has a positive influence on project results (Bresnen & Marshall, 2000; Cicmil & Marshall, 2005; De Ridder, 2015; Dorée, 2001).

Effect of collaboration

Following De Ridder (2015), the scope of a construction project consists of the 'triple constraint'; cost, time and (qualitative) performance, see figure 1. In a contract these three constraints are determined in respectively the budget, the time schedule and the normative performances. A successful project result should be within the boundaries of the budget and time schedule and exceed or meet the normative performance requirements. Unfortunately, projects often exceed the cost and time limit while reaching under the normative performances, illustrated in figure 2.

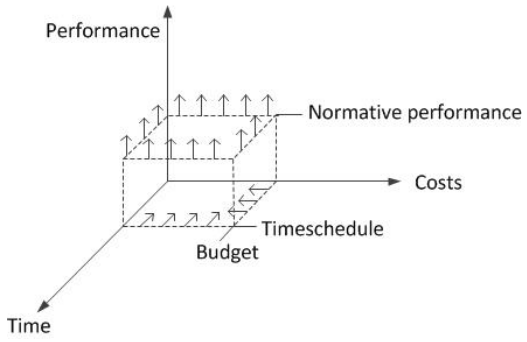

Figure 1: Triple constraint (De Ridder, 2015)

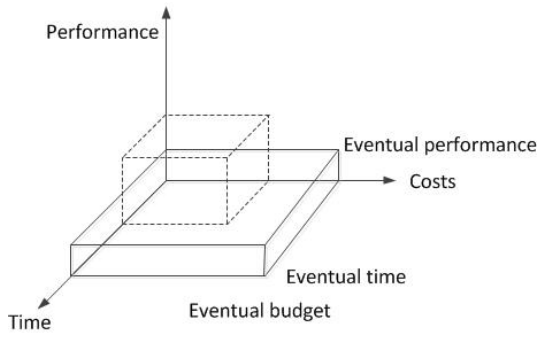

Figure 2: Unsuccessful triple constraint (De Ridder, 2015)

Collaboration within the construction process, which in literature is also often referred to as cooperative relationships or partnering, is defined as “a management approach used by two or more organizations to achieve specific objectives by maximizing the effectiveness of each participant’s resources” (Rolingson & Cheung, 2004, p. 2). The most important relationship within a construction project is the client-contractor relationship (Dorée, 2001). A comparative research into the effects of client-contractor collaboration, performed by Akintan and Morledge (2013), identifies the eight advantages that directly or indirectly contribute to the maximisation of quality performance and minimization of cost and time within the triple constraint.

“A client-contractor collaboration;

1. Delivers lower building cost for the client and higher profits for the contractor;
2. Improves the chance of capturing client’s expectations and their eventual satisfaction;
3. Recognizes and protects the main contractors’ profit margin, making them better able to deliver on the quality requirements of projects;
4. Increases value and predictability of work;
5. Reduces the number and severity of contractual disputes;
6. Creates an enabling environment for innovation and technical development;
7. Encourages continuous improvements;
8. Results in shorter overall project time” (Akintan & Morledge, 2013, p. 3).

1.2. Procurement within the construction sector

The relationship between the client and contractor (C&C) commences in the procurement (tendering) procedure. Procurement is the process of finding a suitable contractor for the execution of a desired product, delivery or service, finalized in a contractual agreement. In order to provide an equal chance between providers and optimize the functioning of the construction sector, procurement is regulated by European Procurement Law. The essence of procurement law is to guarantee transparency, non-discrimination and competition to find an optimal provider for the procured assignment. The obligation to tender within the boundaries of the European Procurement Directive is determined by the procurement entity and the value of the product, delivery or service that is procured (Chao-Duivis, Koning, & Ubink, 2013).

Firstly, European Procurement Law is solely obliged to public procurement entities. These entities are defined by governmental parties (state, provinces, municipalities and water boards) or other public entities who are partly or fully owned or managed by governmental parties (Rijkswaterstaat, Rijksvastgoedbedrijf, Universities etc.) Private parties have the freedom to procure without the use of European Procurement Law (Pianoo, 2016a). Secondly, procurement entities are obliged to procure following the European Procurement Directive when the tender value exceeds the threshold values for public contracts, see table 1. Below these thresholds, procurement entities are free to use the procurement procedures; the National Procurement Procedure with Announcement, the Single Negotiated Procedure or Multiple Negotiated Procedure. These procedures are still regulated by National Procurement Regulations, but are less intensively directed to a transparent and non-discriminatory character (Pianoo, 2016a). Finally, some products, services or deliveries are excluded from European Procurement, like employment contracts or assignments for safety and defence.

Directive 2014/24/EU	
Works	€ 5.225.000
Deliveries	€ 209.000*
Services	€ 209.000*
* €135.000 for central governments	

Table 1: Threshold values for public contracts 2016-2017 (based on (Pianoo, 2015))

Characteristics of a European Procurement Procedure

Following the described rules, publicly tendered construction projects above threshold are characterized by a formal and competitive European Procurement Procedure (Chao-Duivis et al., 2013). Within this procedure, equality, objectivity and transparency should be guaranteed at all times. While these regulations offer constructive tools for the execution of a tendering process, they also create limitations within the procedure. Additionally, the client and contractor have contradictory interest concerning a considerable scope of the contractual arrangement; price, allocation of risk and possibly the contract specifications (De Ridder, 2015). At the end of the procedure a compromise concerning these interests has to be defined in the contract. Consequently, these topics can create conflicts during the procedure. As projects from this size always have a unique set of characteristics, the contractual agreement and procurement procedure cannot easily be standardized.

Current procurement practises

The European Procurement Directive, the conservative culture within the construction sector, combined with past events putting pressure of the market, have led to certain implications within the procurement practises.

The first implication is the fact that European procurement procedures create a power shift between client and contractor. The client has the power during procurement, as the contractors have to fight in a competitive procedure. However, at the moment of award, this power position shifts as the client becomes dependable on the contractor. Additionally, the public construction procurement regulations provide no motivation for project-exceeding relationships, as a satisfying performance cannot be awarded with future work. Both implications cause undesirable practises to be constant and imminent danger (Dorée, 2001).

In 2002, major investigations were performed by the cabinet and department of justice on Dutch public procurement practises. These investigations discovered a large amount corrupt practising by Dutch contracting parties. In most cases contractors had been making fraudulent deals, in which one party compensated the other ones to win the tender. Additionally, agreements were made to collectively raise prices or reduce the qualitative performance in the tender proposals, in order to increase the profits of the contractors (Dorée, 2004). On the other hand, public client were often accused of motivating aggressive competition on price, compensating low profit margins and granting a thrifty compensation for tender cost (Dorée, 2001).

A following event, the building crises that commenced in 2008, put great pressure on both public and private parties. The necessity to acquire work led contractors to make price-proposals under the cost-price and accept unmanageable risk, which caused a one third of the fifty biggest contractors within the construction sector to obtain financial problems (Doodeman, 2014). The expectance of this unrealistic tender proposals ultimately led to fight contracts in which public clients served big losses as well, leading to a great image deterioration, especially the infrastructural sector (Rijkswaterstaat, 2016a). The hard and technocratic sector does not talk with each other about the impact of this practises, which contributes to a persistent making of the same mistakes.

Traditionally, the clients already feel restricted by the obligation to guarantee equity, transparency and objectivity during the procedure. The damage in the trust-relationship between the public clients and contractors further contributes to risk-adverse procurement procedures, leading to a formal and stringent behaviour during the procedure and hesitation towards the use of subjective award criteria. Furthermore, the conservative construction sector is traditionally orientated to procurement of closed contracts, lacking opportunities for the contractors to win based on qualitative proposals offering creativity and innovation (Dorée, 2001). Although procurement practises are changing toward more integrated and quality orientated contracting, the current culture is persistent in its old habits.

Ultimately, all implications, have led to a culture of strategic behaviour and distrust between the client and contractor. This culture continues to facilitate formal and risk-adverse behaviour during the tender procedure and a persistent use of traditional forms of procurement.

1.3. Problem Analysis: Paradigm between Collaboration & Procurement

Due to the implications of the European Procurement Directive, the conservative culture within the construction sector and the pressure that was put on the sector during the building crises, there exist a paradigm between the current procurement practises and the wish to develop collaborative relationships between the client and contractor after the procurement phase.

Pesämaa, Eriksson, and Hair (2009) literally describe client-contractor relationships in a construction process as adversarial and maintaining an arms-length distance, as a result of competitive procurement procedures. Rahman and Kumaraswamy (2005) state the traditional orientation of 'legalistic and static' procurement and 'price-only' selection does not fit the development of harmonious relationships. The combination of this kind of procurement procedures and the use of traditional contracts, which hold little flexibility to change, has led to short-term oriented and adversarial relationships that are focused on contractual rules instead of collaboration (Dorée, 2001).

Contradiction to a 'human-based process'

Several studies have shown that the traditional way of procurement is in contrast with the human-aspect of the construction sector. Palaneeswaran and Kumaraswamy (2000, p. 552) state "The straight-forward selection of a contractor on price alone is based on the assumption that the specifications used in the contract clarifies the product that will be delivered, that all contractors are the same and that they will deliver similar outcomes in all circumstances". As the construction industry is based on human-performance, this assumption is misleading.

The need for improvement

Even though the paradigm between the procurement procedure and collaboration is strongly supported by literature there are several researches that discuss whether changing this process would be preferable. To effectuate a 'paradigm shift' between procurement and collaboration, a fundamental change in attitude and behaviour is required (Eriksson & Atkin, 2009). Research by Eriksson (2010) has pointed out that procurement in the construction industry still facilitates high levels of collision between client and contractor, even though the client is aware of the effects on cooperation. Implementing change does not entail a straightforward process, especially in a phase based on contractionary interests.

However, the procurement procedure determines the composition, responsibilities and functioning of the future relationship. Therefore, improvement should be made during this process (Eriksson & Westerberg, 2011). The early stages of the construction process hold more opportunity to effect the collaboration than later on in the process, and offers more flexibility to new solutions (Mosey & Wiley, 2009).

The necessity to change the Dutch procurement practises can also be seen in the introduction of the 'Marktvisie'. The 'Marktvisie' is an initiative developed by Rijkswaterstaat, the biggest infrastructural client in the Netherlands, to change the ongoing culture within the sector. One of the goals is of the 'Marktvisie' is to increase collaboration, respect and equality among actors to comply with the increasing complexity in the sector. Five leading principles have been developed describing the required change, which relate very closely to the described paradox;

(1) Human factors; Creating trust and empathy for each other's interest & intentions;
(2) Tendering; Using the tender to emphasize on a future collaboration and discuss limitations for this collaboration;
(3) Most Economical Advantageous Tendering (MEAT); Creating the opportunity for the contractor to distinguish themselves based on a combination of quality and price;
(4) Risks; Risk management is based on trust, transparency and open communication;
(5) Price-formulation; both parties are responsible for a reasonable price, -profit margins and -risk division.

Based on all grounds, the necessity of improvement in the current procurement practises is supported. Therefore, this research will investigate the opportunities to increase the potential of a collaborative relation between C&C during the procurement procedure.

1.4. Window of opportunity: Collaborative Procurement

In the last decade, the influence of procurement on the collaborative environment of a construction process gained increased focus. Innovative contracts that aim for a more integral approach of construction processes have been introduced. These contracts increase the need, but also the opportunity, to develop increased collaborative relationships between C&C (Cicmil & Marshall, 2005). Furthermore, a new form of tender evaluation, Most Economical Advantageous Tendering (MEAT), was introduced in the Netherlands. This evaluation method motivates to award on qualitative criteria (like collaboration or organization) in relation to price criteria (Rijkswaterstaat, 2015).

Collaborative Procurement

While there are many studies performed on collaboration, it's facilitators and it's barriers, there are only few studies available on the optimization of collaboration throughout a procurement procedure. The available studies introduce the concept of 'collaborative procurement'. Several researches by Eriksson (2008, 2009, 2010) and Eriksson and Laan (2007) describe a potential shift from competitive to collaborative procurement by implementing incentives during the procurement procedure such as limited invitation and selection of soft parameters. Miller, Furneaux, Davis, Love, and O'Donnell (2009) describe collaborative procurement as relational based procurement that distinguishes itself from traditional procurement by focussing on joint specification, creating compatible key relationships, equal risk division, information sharing and a focus on the combined cost for all parties.

1.4.1. Applicability of collaborative procurement

Collaborative procurement has the goal to optimize future collaboration throughout the procurement procedure. The benefit gained from this goal is dependent on the project. Subsequently, the applicability of a collaborative procurement procedure is determined by this aspect as well. The extent to which a collaborative procurement procedure is beneficial to acquire better project results dependent on the balance between investment in collaboration and the benefit gained form the collaboration. Following Eriksson (2010) this balance is determined by two criteria;

1. *The type of project*
   Collaboration is proven to have increased effect in projects characterized by high customization, -duration, -time pressure, -uncertainty and -complexity (Eriksson, 2008; Pesämaa et al., 2009). Investment in collaboration within projects with these characteristics are therefore more important.

2. *The governance form*
   The facilitation of collaboration is more significant in projects that use a more cooperative form of governance, meaning the contractor and client have a more intense relationship. The form of governance is mostly defined by the type of contract that is used within the project. Therefore, the investment in a collaborative procurement procedure is more important in integrated-, life-cycle- and alliance contracts. However, informal agreements can also determine part of the governance form.

It should be noted that the type of project and governance form are often interrelated. For effective use of collaborative procurement, an optimal ration between the initial investment and eventual profit should be realized.

2. Research Design

In this chapter the research will be explained throughout the problem definition, research objective, research question and scope definition. Secondly, this chapter will explain how the research is conducted by means of the research approach and the research methodology. Lastly, the relevance of the research is discussed.

2.1. Problem definition

Concluding from an elaborated literature study, *the current procurement practises create barriers for the development of a collaborative relationship between C&C after procurement,* see figure 3. This problem definition applies to projects within the Dutch construction industry that are procured following the European Procurement Directive.

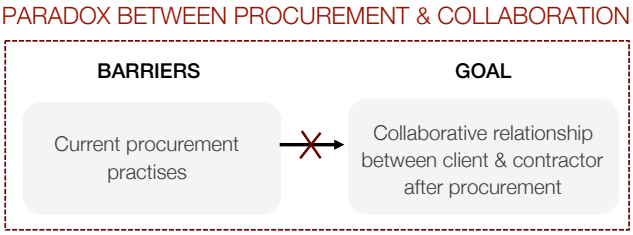

Figure 3: problem definition

There is a great quantity of literature available concerning factors that facilitate or obstruct a collaborative relation. However, there is little literature available on how to facilitate the potential for a collaborative relationship during the procurement procedure, the process in which the defined problem arises. As a result, it is perceived there is a lack of concrete tools to overcome this problem.

2.2. Research objective & Research question

The goal of this research is to *provide a design for a collaborative procurement procedure to increase the potential of a collaborative relation between C&C during the construction process*.

Based on the defined problem definition, this research assumes the current procurement practises creates barriers that have a negative influence on the development of the collaborative relation between C&C after the procurement phase (research goal). Therefore, this research aims to identify a design that will decrease these barriers and thereby enhance the potential of a collaborative relation after the procurement phase. Multiple studies state a collaborative relation is positively related to achieving successful project results, the higher goal of this research (Bresnen & Marshall, 2000; Cicmil & Marshall, 2005; De Ridder, 2015). The assumed relations are shown in figure 4.

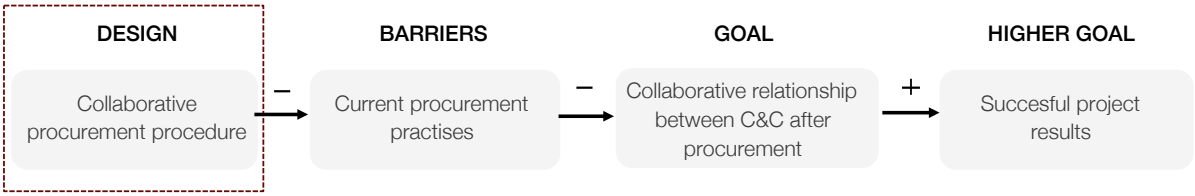

Figure 4: Conceptual research model

This research will use a step-by-step approach to define concrete measures to overcome the defined problem. To increase the usefulness and relevance of this research, these measures will be translated into a design of a collaborative procurement procedure. It should however be emphasised that the design is a choice model, as the process of a procurement procedure cannot be standardized. The following research question will be answered by means of the design and some overall conclusions;

How can the potential of a collaborative relation between client and contractor be increased throughout the procurement procedure of a construction process?

2.3. Scope definition

In order to make the research feasible, the exact content of the research is determined in a scope definition. This definition states which concepts are within or beyond the barriers of the research.

This research aims to formulate the design of a collaborative procurement procedure. The procurement procedure is defined as the period ranging from the start of the definition of the tender procedure to the final signing of the contractual agreement (further explained in chapter 3.1). This research will only focus on solutions during the procurement procedure, though it should be emphasized that the enhancement of a collaborative relation between C&C should be facilitated and maintained during the whole construction process. As the design of a procurement procedure is made by the client, this research is written from the client-perspective. However, it should be emphasized that the defined problem is created by both the client and contractors. Therefore, the process that the contractors define for their tender submission is relevant is well. This research will address how contractor can be motivated to focus on collaboration throughout the procedure.

The design of a collaborative procurement procedure will be developed within the scope of (1) the public construction sector, (2) procurement procedures above European threshold and (3) defined in process design (figure 5). The limitations of this scope is addressed in the discussion. Following, each part of the scope definition is explained.

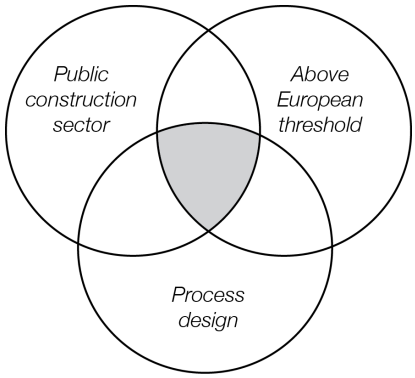

Figure 5: Scope definition

Public construction sector

This research will focus on the public sector of the construction industry as this is the environment to which the problem definition applies.

Above European threshold

This research will focus on procurement procedures above the European threshold. These procedures imply a competitive environment in which a level playing-field must be guaranteed, based on the principles of the European Procurement Directive. Although these procedures only apply to a small part of all procurement procedures within the construction industry, these are the procedures to which the defined problem definition is most applicable.

Definition of a process design

This research aims formulate a design for the process of a collaborative procurement procedure. Currently there is little research available on this topic. That is why this research will focus on identifying new and existing process measures that create a higher potential for collaboration after the procurement procedure. These measures should;

(1) Describe concrete steps that extend the basic design of a procurement procedure or that define a certain implementation of existing steps;
(2) Define general ideas instead of project-specific ideas;
(3) Define how strategic choices like contract choice or risk allocation can be addressed within the procurement process. The research does not focus directly on these choices as this is a widely discussed and very complex topic on its own.

2.4. Research approach

This research aims to develop a design to overcome the defined problem definition. The research applies to 'Field Problem Solving' (FPS) research which Aken, Berends, and Bij (2012) describe as a study that tries to discover how the current situation, which in the view of some stakeholders can or should be improved, can be translated towards the preferred situation. This field of research distinguishes theory-informed- and design-orientated problem solving. This research utilizes a design-oriented approach in which a problem solving cycle is used.

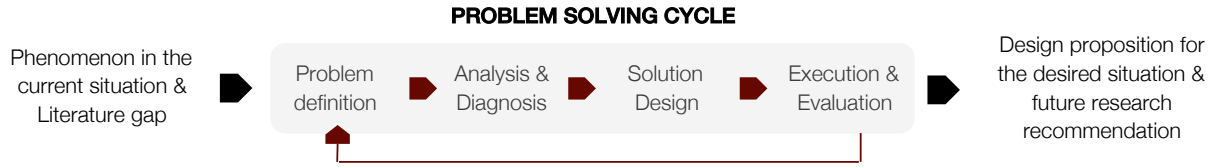

Figure 6: Design-oriented FPS research (based on Aken et al. (2012))

In a FPS-research the researcher works in dialogue with the experts to develop a design. This research's client is Twynstra Gudde, a consultancy firm focussed on solving complex organizational problems. This research is conducted for the division Tendering and Contracting in particular. This division contributes to the development of procurement and contracting strategies, mainly in the construction sector. Though, this research's target audience are al experts interested and invested in procurement strategies in the construction sector. The direct stakeholders of this research are the clients within the Dutch construction sector as they design the procurement procedures.

2.4.1. Phases & Sub-questions

As this research aims to develop a design for a collaborative procurement procedure, the problem solving cycle creates the basis for the research approach, illustrated in figure 7. Although a problem solving cycle can be repeated multiple times, this research will only conduct one full cycle given the time limitation.

The problem definition, based on the perceived phenomenon and literature gap, has been defined in the research design. Hereafter, the research will be executed following three phases. First of all, the existing procedures and the restrictions within these procedures will be analysed to understand the 'environment' in which the design is constructed. Furthermore, all barriers that occur in the current procurement practises, that obstruct the development of a collaborative relation between C&C, are identified (phase 1). Thereafter, this identification will be used as the basis to define measures which limit these barriers and therefore create input to a collaborative procurement procedure (phase 2). Sequentially, this input will be evaluated to acquire an opinion on the potential of this input. This will contribute to the validity, reliability and generalizability of the design input (phase 3).

The results of each execution phase will be used to develop a design for a collaborative procurement procedure. Together with some overall conclusions, this design will be used to answer the research question. Furthermore, a discussion and recommendations for further research will be provided.

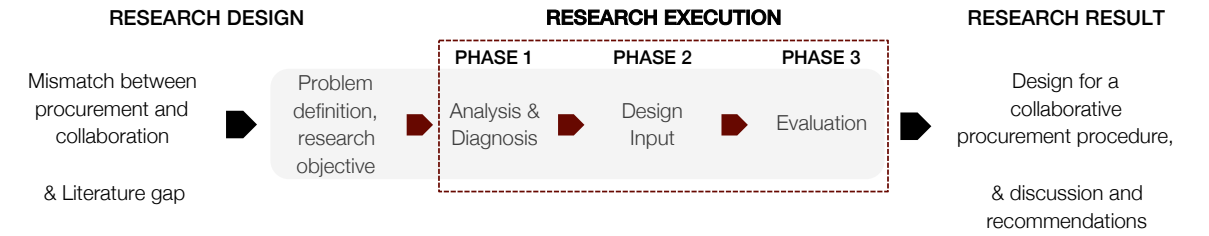

Figure 7: Research approach

Following, all steps are explained, providing the sub-questions and structure that leads to the answer to the research question.

Research execution

Phase 1: Analysis and diagnosis

Before gathering the design input, the design requirements are formulated to define the focus of the desired design. These requirements refer to the barriers, obstructing the potential development of collaboration, occuring in the current procurement practises. These barriers should be limited in the design. Furthermore, the design starting point and -restrictions define the existing procedures and boundary conditions in which the design has to be developed. This content will be based on an elaborate research into procurement law and -procedures. Furthermore, the concept of collaborative procurement is described. The following sub-questions are answered;

Input for	Sub-questions
Design starting point & -restrictions Design requirements	1a. What are the characteristics and boundary conditions of a (collaborative) procurement procedure? 1c. Which barriers, occurring in the current procurement practises, obstruct the potential for a collaborative relation between C&C?

Phase 2: Design input

After the definition of the design starting point, -requirements and -restrictions, input towards the design is gathered. Following the research objective, this input is directed towards the design requirements only. This approach emphasizes an open view on what is possible rather than a closed view on what procedures are yet available and what restrictions should be considered. This input is given in process measures for a collaborative procurement procedure. A clustering of the different design measures results in design themes, defining the most important elements of a collaborative procurement procedure. These themes will serve as the substantive basis of the final design. The following sub-questions are addressed;

Input for	Sub-questions
Design measures	2a. Which measures can increase the potential for a collaborative relation between C&C?
Design themes	2b. Which themes should be addressed within a procurement procedure to increase the potential for a collaborative relation between C&C?

Phase 3: Evaluation

The design themes are defined by an explorative form of research. Therefore, an evaluation of the potential of these themes is relevant. Given the time limitation of the research, a collaborative procurement procedure cannot be executed and evaluated in a real construction process. Subsequently, within this research, the design themes will be evaluated based on expectations. This evaluation is directed to the perceived potential of the design themes, based on effectivity, feasibility and preference. Within the aspect of feasibility, a specific focus is put towards the implementation within the European Procurement Directive, which is essential for the use of a collaborative procurement procedure. The following sub-question is answered;

Input for	Sub-question
Validation of potential	3a. How do the users perceive the potential (effectivity, feasibility & preference) of the design themes of a collaborative procurement procedure?

Research Result

During the course of the research execution all input will be gathered to formulate a founded design for a collaborative procurement procedure that facilitates a higher potential of collaboration between C&C after the procurement procedure. This design;

(1) Will offer concrete measures;
(2) Will be embedded in the existing procedure and fit to the restrictions with the procedures;
(3) Recommends the most effective & feasible approach to acquire the formulated goal.

It should be notified that the design is a (comprehensive) choice model as a collaborative procurement procedure can utilize various approaches and cannot be standardized for different projects.
By means of the design and some overall conclusions, the research question will be answered.

2.5. Research Methodology

This research will use a design-approach to formulate a design to achieve the formulated goal. This approach requires a flexible, creative and open character (Aken et al., 2012). The participants and methods are selected based on these characteristics.

2.5.1. Research Typology

Lancaster (2005) states the typology of the research is defined by three choices, influencing the selection of research methods and type of analysis. The following choices are made for this research;

(1) Use of primary (empirical) or secondary (existing) data;
This research aims to explore measures for a collaborative procurement procedure, which have not yet been described in literature. Therefore, the design- and evaluation phase require primary data collection. Secondary data, available in literature, will be used in the analysis and diagnosis phase.

(2) Use of qualitative of quantitative data;
Based on the research' 'soft'- and explorative character the decision was made to focus on qualitative data.

(3) Form of data collection;
Based on the flexible and open character of a design-approach it is chosen to use action research, a type of research in which several data collection methods are used. This approach will create the flexibility to acquire the right form and extend of data for all steps within the design cycle (Lancaster, 2005). Interviews, focus groups, and observation are defined as fitting methods for a qualitative design-approach in particular (Aken et al., 2012).

Additionally, the methods for each phase are chosen and constructed to optimally guarantee the validity, reliability and generalizability of the research.

2.5.2. Methods & Analysis

Based on the different goals applicable to each phase, three different methods are selected, all fitting to the pre-defined criteria. The chosen method and form of analysis is described for each phase.

Research execution

Phase 1: Analysis & Diagnosis

As the problem definition and existing practised are well described in literature, this phase uses existing scientific and non-scientific literature to provide the basis for the design; the design starting point, -restrictions and -requirements (sub-question 1a and 1b). Content analysis is used to interpret the data, ultimately using matrices to compare and cluster the collected data.

Phase 2: Design input

Based on the qualitative and explorative character of this phase, focus groups were selected as fitting method. To address an open and creative process to define the design measures (sub-questions 2a), the focus groups are shaped as brainstorming sessions. These sessions are focussed on the formulation of measures that fit the design requirements and thereby provide substance to a collaborative procurement procedure. The data collection will be acquired through four focus groups composed of three to four participants. The composition of these groups consists of procurement experts from different backgrounds. The brainstorming process is designed to motivate creativity and synergy among the experts, using various brainstorm techniques. Furthermore, the process is set up to gradually increase the level of detail in which the measures are described. Hereby, the focus groups aim to utilise the full potential of the group setting. A protocol of the focus groups is provided in appendix B.1.

The transcriptions of the focus groups, including the mind-maps created during the focus groups, provide the basis for analysis. This data will be clustered and coded to interpret the results; the design measures. Cross-analysis between the different sessions leads to the definition of design themes (sub-question 2b). These themes identify the most relevant topics in a collaborative procurement

procedure, which can be addressed by using different measures. A protocol of the analysis is given in appendix B.2

Phase 3: Evaluation
In the last phase, the potential of the design themes is evaluated based on expectations of the future users. Therefore, an expert panel, composed out of six experts that participated in the focus groups, is consulted for this evaluation.

During a presentation of the design themes, the participants will be asked to give their opinion concerning the potential of each theme. The potential is derived by ranking three criteria; (1) effectivity, (2) feasibility and (3) preference. Furthermore, the panel is asked to give additional notes on their opinion, possibly concerning the different measures within the themes. The opinion of the group is addressed in an open discussion. The ranking, notes and discussion of the expert panel are put in a transcript. The protocol of the expert panel is provided in appendix D.1.

Research results
The themes and measures, defined in the design input phase, define the substantive input for the design. The themes are translated into check-lists and process-models, collectively providing a comprehensive choice model for a collaborative procurement procedure. However, the design will also be developed by relating this input to the existing procedures and limitations within procurement law (design starting point and -restrictions). Furthermore, the evaluation of the potential of the design themes is used to provide a sharper recommendation within the design.

An overview of the execution- and result phase, and the developed methodology, is illustrated in figure 8.

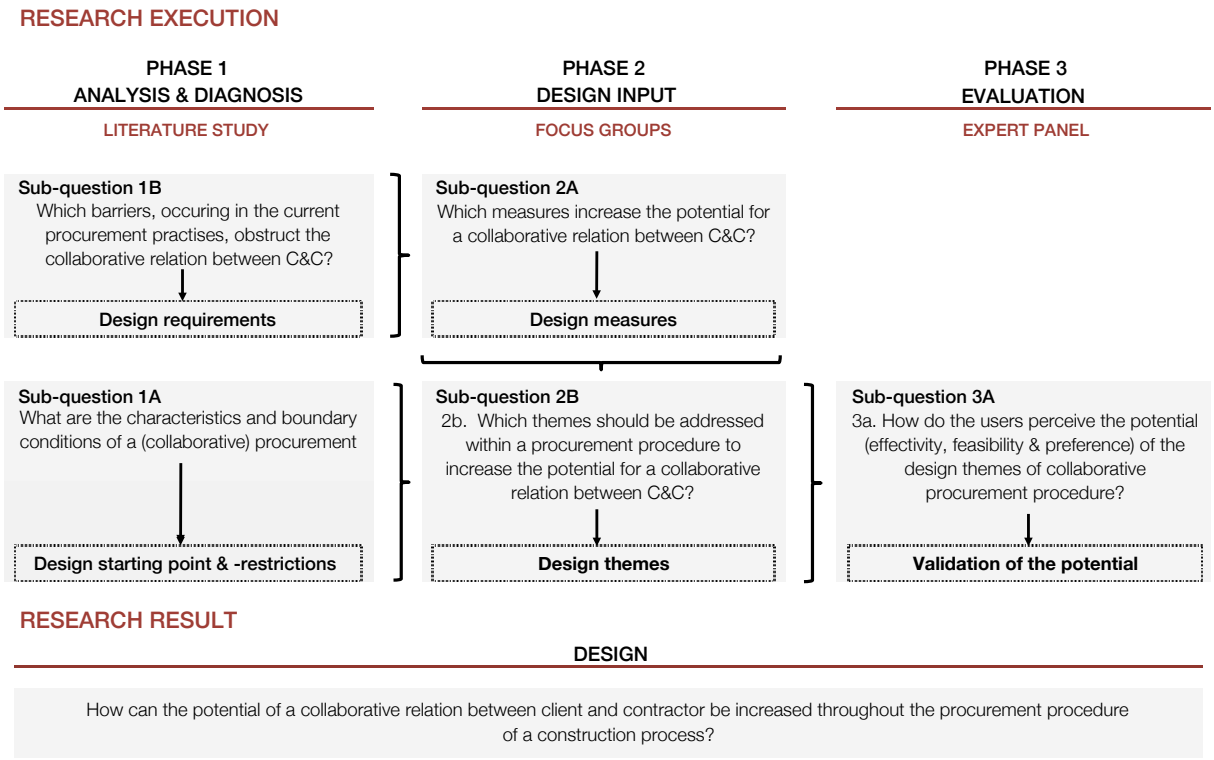

Figure 8: Overview research methodology

2.6. Research relevance

This research is selected on both the topicality in practise as a defined gap in scientific literature. Both topics are described.

2.6.1. Scientific relevance

The scope of the research is selected based on a defined literature gap. There is a vast amount of research conducted on collaboration, procurement and the paradox between both (Eriksson & Westerberg, 2011; Kadefors, Björlingson, & Karlsson, 2007).

While this problem is well established in scientific literature, only a few researches have investigated possible solutions to this problem. The available studies only provide conceptual ideas such as rational contracting (Plane & Green, 2012; Rahman & Kumaraswamy, 2005), collaborative procurement (Eriksson & Atkin, 2009; Walker, Schotanus, Bakker, & Harland, 2013) and relational- or competence-based tendering (Ivanova, 2016; Kadefors et al., 2007). However, these concepts lack insight in their practical implementation and effect (Eriksson & Atkin, 2009; Ivanova, 2016; Kadefors et al., 2007).

This research aims to provide a concrete design to enlarge the potential of a collaborative relationship between C&C. The key additional value is that this research will therefore provide tools to implement collaborative procurement measures within the available procedures.

2.6.2. Practical relevance

The selection of the subject of this research is based on the topicality in the Dutch construction industry. Collaboration is one of the eminent topics in this industry which is pointed out in the 'Marktvisie'. Furthermore, the current trends in procurement law and contracting shows increased focus on collaborative forms of procurement. Both trends are elaborated.

The 'Marktvisie'

Various events in the last decade have influenced the current relationships in the construction sector. Corruption activities around 2002 and the building crisis, commenced in 2008, have led to a disruptive culture of strategic and dishonest behaviour. Subsequently these events have resulted in a deceased level of trust between the clients and contractors, affecting current procurement practises (Dorée, 2004). Therefore, the defined research topic gained increased focus in the last years. An example of this is the development of the 'Marktvisie' since January 2016 (Rijkswaterstaat, 2016a).

The 'Marktvisie' is an initiative developed by Rijkswaterstaat, the biggest infrastructural client in the Netherlands, to change the ongoing culture within the sector. An open dialogue between the clients, contractors, suppliers, advisors and end-users within the sector is created to develop a future vision for the construction industry (Rijkswaterstaat, 2016a). One of the goals of the 'Marktvisie' is to increase collaboration in the sector, based on five leading principles. One of these principles is tendering, which emphasizes on achieving more collaboration throughout the tendering procedure. (Rijkswaterstaat, 2016b). This research creates concrete tools that can contribute to the realization of this principle.

New procurement law

This research is focussed on creating a more collaborative procurement procedure, which is relevant to the current changes in procurement law. Since July 1st 2016, the new Procurement Directive offers increased freedom in the use of both the Competitive Dialogue Procedure and the Competitive Procedure with Negotiation. Additionally, the Innovative Partnership procedure has been introduced (Partners, 2016). All three procedures emphasize the use of joint specification, open dialogue or negotiation during the procurement phase, which are defined as positive factors for collaborative procurement (Eriksson & Atkin, 2009). Furthermore, this directive obliges the use of MEAT, motivating award on qualitative criteria next to price.

PART TWO
EXECUTION

3. Phase 1 - Analysis and Diagnosis

In the Analysis & Diagnosis phase a literature study is conducted to define the core concepts that create the focus for the design input phase. To begin, the concept of construction procurement, together with the concept of collaborative procurement, is discussed as this defines the starting point and -restrictions for the design. Sequentially, research into the concept of collaboration and the barriers for collaboration occurring in the procurement phase are translated into the design requirements.

3.1. Design starting point & -restrictions

This research aims to design a collaborative procurement procedure. This design should provide concrete measures that contribute to an enlarged potential of the collaborative relation between C&C and exceed the current procurement practises. To create insight in the current practises, formulated as the 'design starting point' and 'design restrictions' of the research, sub-question 1a is answered;

What are the characteristics and boundary conditions of a (collaborative) procurement procedure?

To start, the definition of the different procurement procedures is explained, discussing the core elements and restrictions within these procedures. Subsequently, the concept of collaborative procurement is introduced and related to these elements. Lastly, some influential decisions related to the procurement procedure are discussed.

3.1.1. The procurement procedure(s)

The term procurement procedure involves the entire process of finding a suitable contractor to execute the desired product, delivery or service, finalized in a contractual agreement. Previous to the procurement procedure, the client determines his question towards the market. Herein, he formulates the required distribution, planning, duration and form of the desired contract(s). Thereafter, the procurement procedure covers the definition of the tender procedure and the execution of the tender, resulting in a signed contract between the client & contractor, see figure 9.

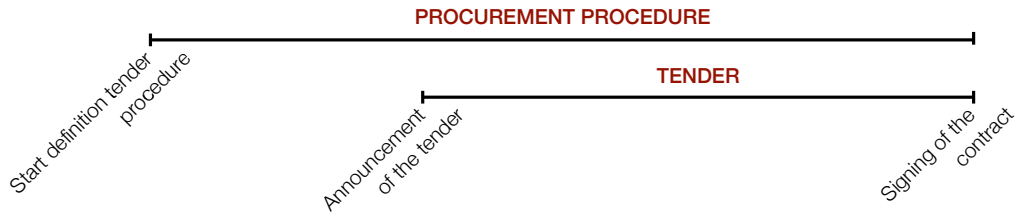

Figure 9: Scope procurement procedure

Definition of the tender procedure

The tender procedure defines the process of awarding a contractor, ranging from announcement of the tender until signing the contractual agreement. Following Chao-Duivis et al. (2013) a public tendering procedure is roughly divided over the following steps;

Step 1: The tender is announced and the documents are published by the client;
Step 2: Information rounds are held by the client (can be in written form);
Step 3: (Possible) pre-selection of the participants;
Step 4: Submission of the tender proposals by the participants;
Step 5: Evaluation and award of the proposals by the client;
Step 6: Period of 20 days in which participants can object the award decision;
Step 7: Possible signing of the contract between C&C.

There are multiple tender procedures described in procurement law, all going through the defined steps. In practise, the Open- and Restricted Procedure are the most frequently used procedures and form the basis for the additional (extended) procedures (Chao-Duivis et al., 2013; Pianoo, 2016g).

1. Open Procedure

During an Open Procedure, there are no restrictions to the participation of the tender procedure. Therefore, all willing contractors can submit a proposal. The advantage of this procedure is the possibility to assess the participants and proposals simultaneously. The assessment of a large number of participants can be a disadvantage of this procedure (Chao-Duivis et al., 2013).

2. Restricted Procedure

The Restricted Procedure is often framed as an Open Procedure with prior selection. In reference to the Open Procedure, the Restricted Procedure involves an extra step of limiting the number of participants based on previously announced selection-criteria. This procedure offers the advantage of pre-selecting a number of qualified participants before assessing the proposals (Chao-Duivis et al., 2013).

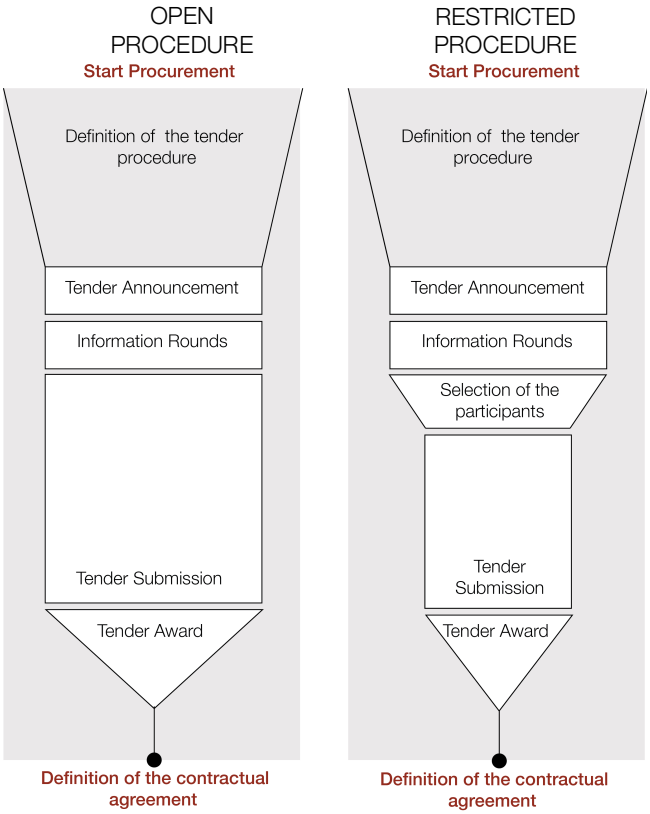

Figure 10: Open- and restricted tender procedure (based on (Chao-Duivis et al., 2013))

Additional tender procedures

Three additional procedures are defined in the Dutch procurement law each providing an extension to the open- or restricted procedure (Chao-Duivis et al., 2013);

3. Competitive Dialogue Procedure

A Competitive Dialogue Procedure is a tendering procedure intended for more complex projects, in which certain topics are still unclear and in need of further exploration. A Competitive Dialogue Procedure is mostly used after making a selection of suitable participants. The procedure is build up out of various rounds of dialogues, in which a specific problem is discussed. After each round, the client can disengage a participant on the basis of pre-defined award criteria. The advantage of this procedure is the possibility to invent solutions for uncertain requirements. After the previously determined set of dialogue rounds, the participants that are still in the running, compete in a normal tender procedure (Aanbestedingswet-2012, 2016; Pianoo, 2016g).

4. Competitive Procedure with Negotiation (with or without prior notification)

A Competitive Procedure with Negotiation is similar to a restricted procedure with the exception of the negotiation phase that is incorporated. A negotiation phase can be used after assessment of the proposals in a situation in which the bids do not fit the expectations of the client (within a certain aspect). In the negotiation phase the client discusses the improvement of the proposals with each individual participant. Thereafter, altered proposals can be developed. This procedure can be repeated several times, and provides the possibility for a knockout system (Aanbestedingswet-2012, 2016; Pianoo, 2016g).

5. Innovative Partnership

One newly defined procedure in the new Procurement Directive, announced in July 2016, is the Innovation Partnership, which is developed to increase innovation. Formerly, it was very challenging to implement innovative measures in a traditional contract, as it holds to much risk for the contractors.

In this new procurement procedure this risk is divided. The procedure works as follows; the procedure starts with an announcement of the project and selection of the participants. The competitive phase is directed to the award of the contractor based on their proposals for the development phase. One or more contractors become part of the Innovation Partnership (temporary contract). The development phase exists out of different rounds, synchronic with a research and development process, that are used to develop the required innovation. After each round (temporary contract), each participant provides a proposal which determines if the contract is continued or not. The participants are paid with a set amount for each round of the Innovative Partnership. After several rounds, a final commercial bid is made by the participants, following a normal tender procedure (Aanbestedingswet-2012, 2016; Pianoo, 2016d).

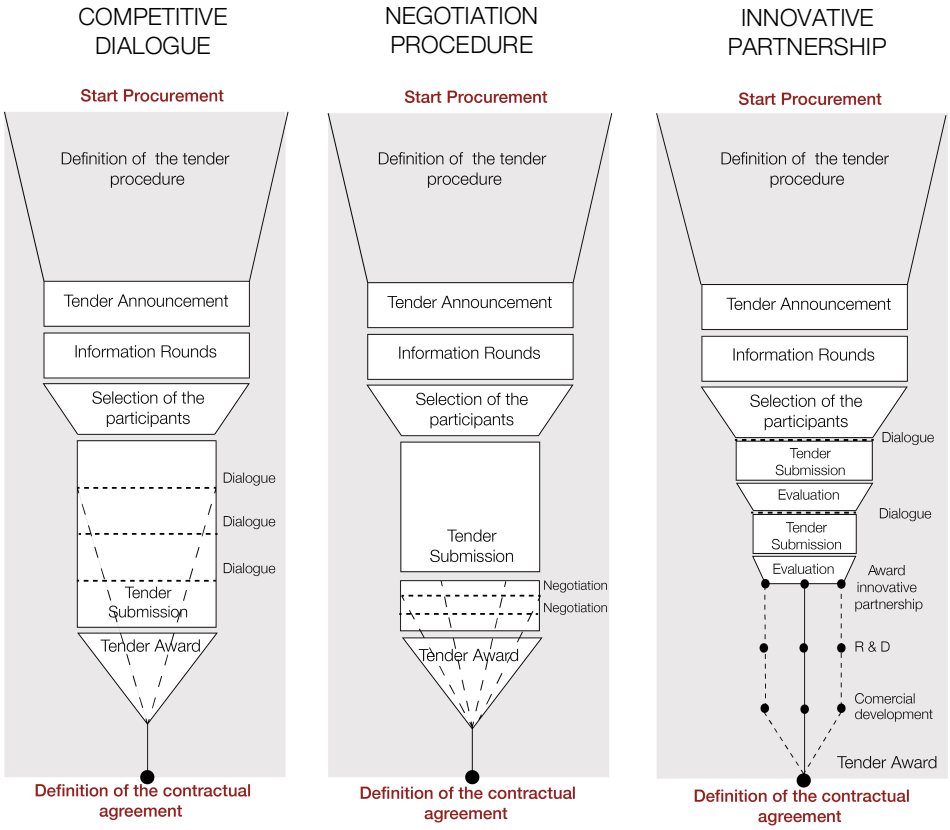

Figure 11: Additional tender procedures (based on (Chao-Duivis et al., 2013)

Furthermore, Chao-Duivis et al. (2013) names four extra procedures; (1) procedure with selected parties/private invitations to the tender procedure, (2) concessions procedure, (3) framework procedures, and (4) competition for services. This research will not elaborate on the pre-mentioned procedures as they are either used infrequently or are less important to the research scope.

3.1.2. Boundary conditions of the procurement procedure

Procurement law aims to provide an equal chance for every willing participant during the selection of a provider (contractor). Procurement law therefore defines certain boundary conditions that should be incorporated within a procurement procedure. While this regulation provides tools to execute a procedure it creates limitations as well, which are referred to as the design restrictions of this research.

Principles of procurement law

All processes and decisions within a tendering procedure should be executed in coherence with the principles of the European Procurement Directive;

1. The equality principle obliges contracting parties to treat each citizen equally under equal circumstances.
2. The transparency principle states it must be possible to test the decisions taken by the contracting authorities.
3. The proportionality principle requires the procedures and requirements of the tender to be in proportion to the assignment.
4. The competition principle obliges the invitation of a tender to attract competition, though it is possible to limit the selection of participants.
5. The motivation principle defines that all contracting authorities have to substantiate the decisions made in the procedure.
6. The principle of legitimate expectations state that justified expectations deserve protection (Chao-Duivis et al., 2013).

The implementation of the different principles results in two practical implications. These implications are important in the design of a collaborative procurement procedure.

Information symmetry and unambiguousness

One important implication of the equality and transparency principle is that during the course of the tender, each contractor should be provided with the same information to guarantee a level playing-field between the different contractors. Furthermore, based on the principle of objectivity and motivation, all criteria and specifications should be defined as unambiguous as possible, as the client should be able to objectively motivate their selection- and award process (Pianoo, 2016b).

Restriction of essential change

Additionally, no essential changes can be made in the contract specifications during and after the tender procedure. Whenever essential changes are made, the tender procedure has to be repeated from the start. Essential changes are;

(1) Considerable alterations to the specifications in which the physical state or application of the assignment changes or expands;
(2) Amendments that make the participation of excluded contractors possible;
(3) Amendments that change the economical balance of the assignment positively for the contractor in an unforeseen matter;
(4) The contractor is replaced (without special circumstances taking place).

Change within 10% or 15% of the original value in respectively services and works, is not perceived to be essential. Alterations initiated by the contractors or the client itself can be permitted when the changes are not essential. The process of addressing changes can be described in the contract specifications. The use of specifications with an open character can decrease the change of essential changes (Pianoo, 2016j).

3.1.3. Core elements of the procurement procedure

All European Procurement Procedures are shaped by one of the available procedures given in procurement law. However, each unique project designs their own tailored version of one of these procedures. The formation of a tendering procedure is determined by the following elements; the contract specification, consultation of the contractors and the definition of the tender selection- and award- criteria. Following, each element is explained.

Contract specification

The contract specifications describe the technical or functional boundaries of the tendered product, delivery or service. These specifications are published during the tender announcement and explained in the information rounds. The specifications should guarantee transparency, non-discrimination and proportionality. Furthermore, the contract specifications can be described in different levels of detail. This determines the level of freedom that is provided to the contractors in their tender proposals, and later on in the execution of the project.

1. In (strict) technical specifications a detailed shaping of the assignment is formulated by the client.
2. Performance- or functional specifications are intended to provide freedom to the contractors to specify solutions during and after the tender.

Consultation of contractors

Clients can choose to involve the contractors in the further definition of the tender assignment or contract specifications. Market consultation before the start of the tendering procedures is often used to scan the possibilities, or discuss elements, of the assignment. As the consultation does not take part in the formal tendering procedure, the client has to guarantee full information symmetry between the parties who did and did not participate in the consultation and eventually subscribe to the tender. Involvement of the contractors can also befall during the tender in the Competitive Dialogue Procedure and Negotiation Procedure (Pianoo, 2016f).

Tender Selection

The selection procedure within the tendering process is directed to the election of the most suitable and experienced participating organizations, named shortlisting. Within an Open Procedure, firms can only be excluded based on the grounds for exclusion or a qualification beneath the minimum-requirements. These requirements concern technical, financial or professional capacity. Within the Restricted Procedure, an extra selection of contractors can take place after exclusion of non-qualified contractors, in the case too many participants subscribe. This selection takes place based on pre-defined selection criteria. These criteria do often describe technical, financial and professional fitness as well, but can also address other (qualitative) aspects. The selection phase concludes in the selection of three to five participants. There are strict rules applied to the use of minimum requirements and selection criteria. Evidently, the criteria should warrant transparency, non-discrimination and proportionality. Additionally, both criteria should be directed to the capacity or quality of the organizations in relation to the assignment (Pianoo, 2016h) (Aanbestedingswet-2012, 2016).

Tender Award

Finally, the award of the tender is used to select the contractor that provides the best tender submission. All tender proposals that meet the contract specifications are measured by pre-defined award-criteria. These criteria are set in the Most Economical and Advantageous Tender (MEAT) criteria. This method provides three possibilities;

1. Price-Quality Ratio,
   Both price and qualitative scores are measured against each other;
2. Total Cost of Ownership/ Cost effectivity,
   The effectivity of the price against the lifetime of the assignment is measured;
3. Lowest price (can only be used with motivation),
   Only the price component of the assignment is measured.

Within these MEAT variants, sub-award criteria on financial and/or qualitative aspects are created. These criteria are mostly derived from Key Performance Indicators (KPI's) related to the specifications of the assignment. The weights of the criteria and score-definition should be determined as well. The MEAT variant, sub-award-criteria, the weights and score definition is described in the announcement of the tender and cannot be changed during. The client should be able to make an objective and motivated evaluation of the tender proposals based on this definition. The award-criteria are always directed to the proposal of the desired product, service or delivery, not on the organization itself. Furthermore, performance incentives can be added to the award-criteria to motivate contractors to increase the value of the assignment (Aanbestedingswet-2012, 2016; Pianoo, 2016i).

3.1.4. Collaborative procurement

Research into the facilitation of collaboration through the procurement procedure is rather slim. Though the concept of collaborative procurement has been introduced in some researches (Eriksson & Westerberg, 2011). Different studies by Eriksson (Eriksson, 2008, 2010; Eriksson & Atkin, 2009) have identified and verified how the shift from competitive to cooperative procurement can be designed. Furthermore, several researchers have performed complementary studies on parts of the concept of collaborative procurement. A comparison of these studies is shown in in appendix A.1. Summarized, these studies name several incentives for collaborative procurement procedures relating to the core elements of a procurement process, illustrated in table 2. It should be noted that these incentives stay rather conceptual and are frequently not validated, as most research is focused on the problem rather than the solutions. Following, a short description how literature has described the concept of collaborative procurement so far is described per element.

Core Elements	Aspects related to competitive procurement	Aspects related to collaborative procurement
Procurement procedure	Open procedure (focus on competition)	Limited bid invitation Dialogue or negotiation procedures Tailored procedures
Contract specification	Specification by the client only, Strict contractual specification	Joint specification of the contract Best Value Procurement
Consultation of contractors	No freedom for the contractor to show expertise	Market consultation/ participation/ scans Seeking input from contractors during tender. Interweaving planning & procurement Early Design Contest
Tender selection	Open procedure (no selection)	Limited bid invitation Selection on references
Tender awarding	Price-only awarding	Award on soft parameters Focus on chemistry/cultural fit Focus on partnering characteristics in award criteria
Further partnering implementation	No focus on partnering in procurement	Describing partnering model/attributes/norms in notifications Investment collaborative training and resources. Broad partnering, joint selection of sub-contractors

Table 2: Collaborative procurement in relation to the core elements of procurement

Procurement Procedure

Compared to the Open procedure, the Negotiation- and Competitive Dialogue Procedure, both involving a restricted amount of contractors, increase the flexibility to focus on relational aspects within the procedure (Cicmill & Marshall, 2005; Lenferink & Hoezen, 2011; Marique, 2013). The use of dialogue procedures has proven to increase trust within the project environment. However, the use of a dialogue procedure remains complex due to the competitive and juridical factors that are incorporated. Furthermore, reserved attitudes during the procedure, effective use of the procedure and limitation of transaction cost remain difficult implementation issues (Lenferink & Hoezen, 2011).

Contract specifications

Eriksson and Atkin (2009) argue that joint specification creates an enhanced collaborative environment in contrast to strictly specified traditional contract forms. Joint specification can also be applied through dialogues and negotiation during the tender procedure or through Best Value Procurement (BVP).

BVP, often referred to as the Performance Information Procurement System (PIPS), is a relatively new procurement method developed by Dean Kashiwagi. BVP distinguishes itself by the philosophy that the suppliers are the experts in the process, where clients are the non-experts. Based on this assumption, the client cannot be fully aware of his exact preferences. Therefore, during BVP, the project specifications determined by the client do not describe the desired level of performance. During the tender phase, contractors are asked to set their performance level against their price. After intentional awarding a concretization phase is utilized to further elaborate this performance proposals (collectively), before signing the contract (Santema, Van de Rijt, & Witteveen, 2011).

Consultation of contactors
Consultation of contractors, which is closely related to the level of contract specification, is stated to positively affect the commitment towards the tender and future contractual relation. Apart from the contractor involvement during the tendering procedures three types of incentives have been used in the Dutch construction industry during the pre-competitive stage;

- Market scans or consultation;
- Early Design Contest or Market Reconnaissance aiming to use private parties to generate innovative solution on the basis of a problem definition and some specifications, respectively with a price competition and engineering compensation (Leendertse, Lenferink, & Arts, 2012);
- Interweaving of planning and procurement can be used to create a more valuable level of contractor involvement during the competitive phase (Kadefors, 2011).

Tender Selection
The selection phase can be used to acquire a limited amount of participants which makes it more feasible to perform more comprehensive procedures. Furthermore, selection on the 'partnering potential' of the contractor can be performed by evaluating organizational references (Kadefors et al., 2007).

Tender award
Eriksson (2010) states the use of soft criteria in the award of tenders to be a valuable incentive for enhanced collaboration. Examples of these soft criteria could involve evaluation of partnering criteria or proposals.

Further partnering implementation during procurement
Several partnering incentives are identified to increase the extent to which partnering is achieved during procurement. Cheung et al. 2003a. Bayliss et al. 2004 and Eriksson and Laan, 2007 name the use of 'collaborative tools' or team-building activities to create shared values and trust. Furthermore, broad partnering, which implies the involvement of major suppliers and sub-contractors in early stages of the project, is perceived to improve collaboration (Eriksson, 2010; Rahman & Kumaraswamy, 2005).

3.1.5. Choices influencing the procurement procedure

Apart from the essential elements of the procurement procedure, three contractual choices, determined before the procurement procedure, are strongly related to the figuration of this procedure. The type of contract, risk allocation and remuneration (compensation) of the contract define how the (financial) responsibility is divided among the client and contractor. Hence, these elements are influential to the intensity and execution of the procurement procedure. Furthermore, these aspects are essential part in shaping the relationship between C&C. Subsequently, these topics should be discussed between both parties during a collaborative procurement procedure.

Contract type
A projects lifecycle consists out of several phases; initiation, design, construction, exploitation (which exist out of operation and maintenance) and lastly transfer. The execution of these phases is performed by the client itself or contracted out to a fitting contractor (Prins, Heintz, & Vercouteren, 2005). This division is determinded by the type of contract.

- In traditional contracting, solely the execution phase is contracted out to the contractor, using strict contract specifications. Traditional contracting can also take form in contracting different parties for the design- and construction phase, who work together in a building team.
- Integrated contracting combines both the design- and the construction phase (possibly even the operation and maintenance phase) in one contractual arrangement. An alliance contract entails a traditional or integrated contract in which a specific part is performed collectively.
- In lifecycle contracting, the responsibilities of the design phase until the exploitation phase is fully put in the hands of one contractor. Even part of the initiation phase or transfer of the project can be added into the contract, see figure 12 (Moonen, 2016).

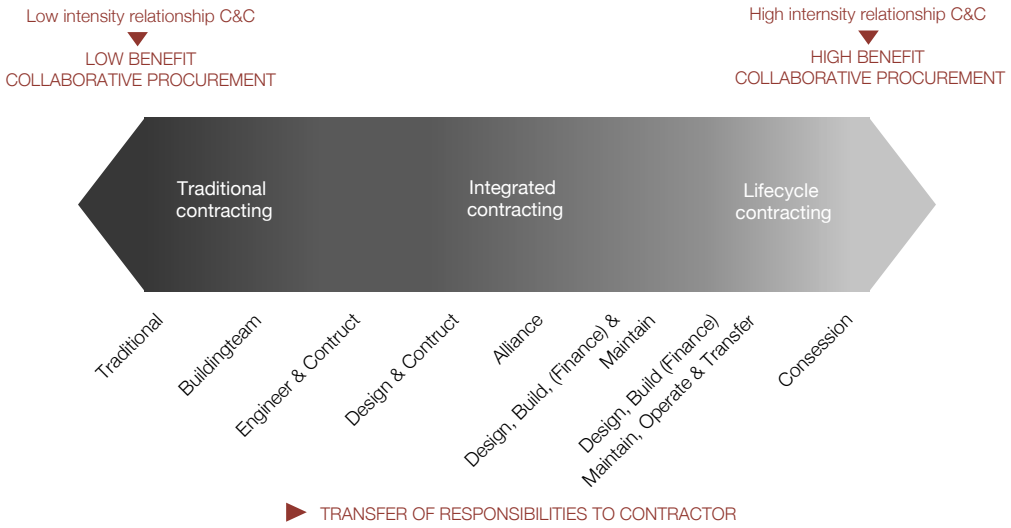

Figure 12: Contract types in relation to collaborative procurement (based on (Moonen, 2016))

The extent to which the responsibilities are transferred to the contractor determine the length and therefore the intensity of the relationship between client & contractor. Integrated and life-cycle contracts are for this reason often referred to as Public Private Partnerships (PPP) (Pianoo, 2016e). Investment in the relational aspects within these contracts is therefore more relevant. In principle, collaborative procurement therefore gains more benefit in these forms of contracting than in traditional forms of contracting (Cicmil & Marshall, 2005). Additionally, the extend of freedom which is provided to the contractor in integrated and lifecycle contracts should also reflect on the procurement procedure.

Risk allocation

The allocation of project risks is dependent on the division of responsibilities within the contract. However, it is emphasized that there is always a grey area concerning this aspect, as risk should be allocated to the party who can control it most efficiently. Unequal allocation of risk is often identified as an important cause for conflict in a construction process, and can therefore be a suppressive factor on client-contractor collaboration within the construction process (Rose & Manley, 2010). Hence, addressing this topic in collaborative procurement is essential.

Remuneration

The form of remuneration (compensation) that is defined in the contract can differ from fixed price to total cost reimbursable. The form of compensation of a contract has effect on the commitment of the contracting party. The use of monetary reward incentives can be applied in the contract to promote the client's goals. Examples are; profit sharing arrangements or performance bonuses exceeding the standard performance levels (Volker & Rose, 2012). The formulation of remuneration of the contract is therefore an important topic within collaborative procurement (Eriksson & Westerberg, 2011), Eriksson (2010), Pesämaa et al. (2009).

3.2. Design Requirements

The design requirements define the focus of the design input. Because most literature is directed towards the problem of this subject instead of the solutions, an outlay of the problem will be used to define the design requirements (in the form of barriers). In order to define the design requirements for this research sub-question 1b is addressed;

Which barriers, occurring in the current procurement practises, obstruct the potential for a collaborative relation between C&C?

To answer this question, the definition of collaboration is derived. Thereafter, the barriers within the current procurement practises, obstructing a collaborative relation between C&C, are identified and related to the concept of collaboration.

3.2.1. Definition of Collaboration

This research aims to optimize the potential of a collaborative relation between the client and contractor within the construction sector. The issue with the term collaboration, often used interchangeably with the terms cooperation or partnering, is the ambiguity of the universal definition (Eriksson, 2010).

Many definitions of collaboration are quite broad and lack insight to the core concept. Chan et al. (2004, p. 189) frames collaboration as “the simple process of establishing good working relations between project parties”. A definition of collaboration referring to the goal of the concept states collaboration is “a management approach used by two or more organizations to achieve specific objectives by maximizing the effectiveness of each participant’s resources” (Rolingson & Cheung, 2004, p. 2). In reference to the construction sector, collaboration is often linked towards formal settings like alliances or Public Private Partnerships (PPP) (Eriksson, 2010).

In this study it is aimed to facilitate collaboration in each form possible, whether formal or informal. Due to the ambiguous character of the definition of collaboration, a literature study is conducted on the facilitating factors for collaboration. This study aims to create a better overview on the definition and related aspects of collaboration.

3.2.2. Facilitating factors for collaboration

Many studies have tried to identify which Critical Success Factors (CSF’s) are related to the concept of collaboration within the construction sector. A comparison matrix, added in appendix A.2, shows the comparison of eight literature sources on this topic. Figure 13 shows the result of this comparison, defining the scope of collaboration.

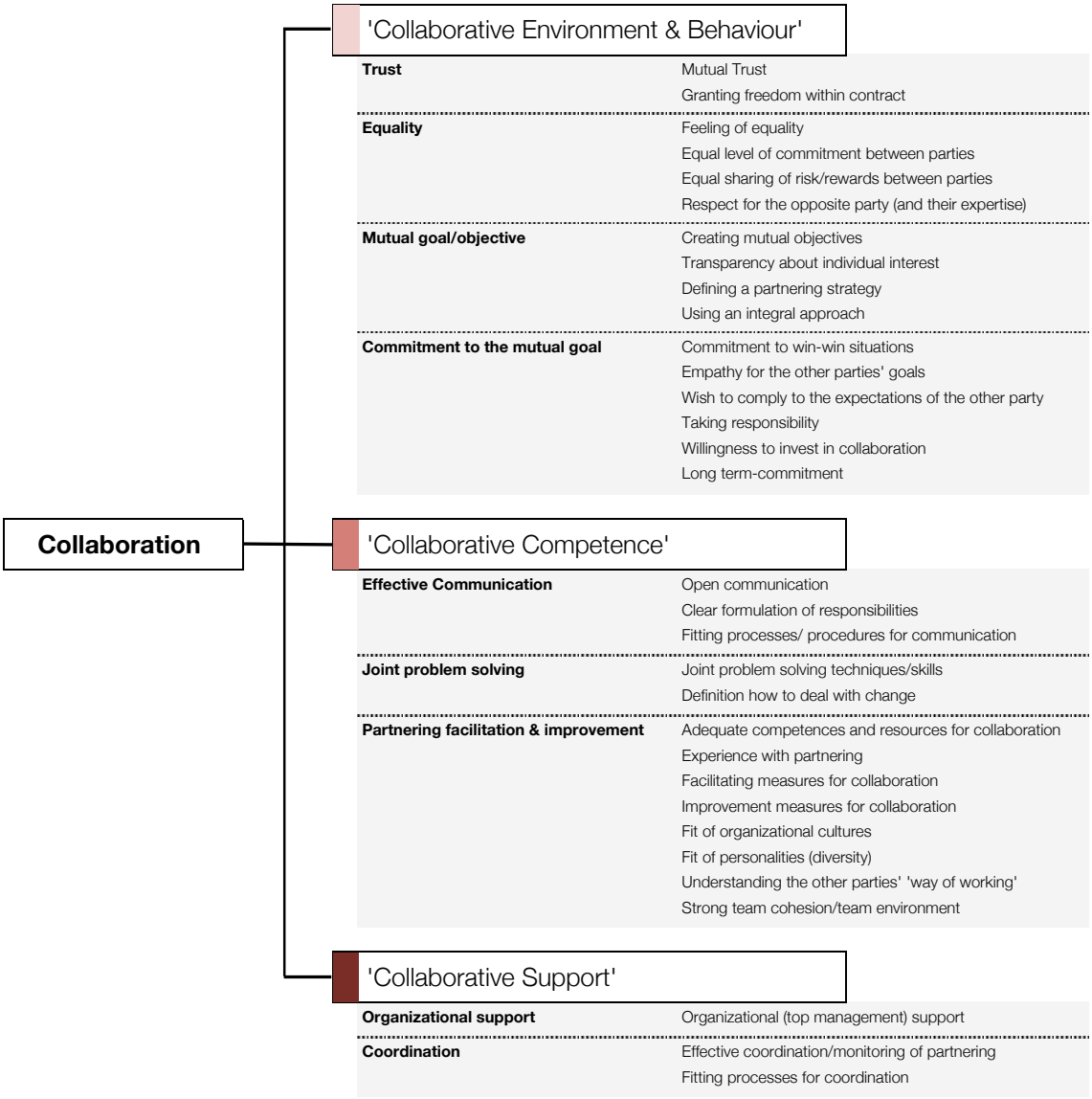

Figure 13: Scope of collaboration

Figure 13 shows nine facilitating factors for collaboration. It should be emphasised that all factors have overlapping identities and therefore serve different interpretations, which is confirmed in literature. Therefore, each factor is elaborated trough the (sub-)factors named in literature.

The scope is diversified in three main clusters. A ‘collaborative environment & behaviour’ exist of the CSF’s; trust, equality, mutual goals and commitment to the mutual goal. This cluster refers to the necessity of a collaborative atmosphere and a fitting commitment to the collaboration. The cluster ‘collaborative competence’ is defined by the CSF’s; effective communication, joint problem solving and partnering facility and -improvement. This cluster can be identified as the required qualities, experience and resources to collaborate. Lastly, the theme ‘collaborative support’ is composed out of the CSF’s; organizational support and coordination. These factors have a key role in maintaining a collaborative relation.

3.2.3. Barriers for collaboration occurring in the procurement phase

In this research it is assumed that the current procurement practises have a negative effect on the development of a collaborative relationship after the procurement phase. To get insight into this problem definition, the barriers occurring in the procurement practises related to the concept of collaboration are identified in Appendix A.3. A comparative research has been performed on five studies and formulated in groups of barriers described in table 3.

Main Barriers	
Persistance of own objectives (based on economical drivers)	Commercial pressure on contractors/ oppertunistic behaviour Emphasis on economical drivers instead of relational drivers by the client (price-only selection methods)* Aggressive negotiation Emhasizing competition by the client (open procedure) Lack of trust towards public clients Non-open and -honest communication Resistence/unwillingness to change
Lack of commitment and mutual specification	Strict contractual clauses are enforced (inappropirate contract strategy) Project specification is only performed by the client Absence of scope for innovation Lack of attention to contractor resistance Lack of consideration of contractor Lack of team working attitude Lack of initiative/commitment client Lack of commitment contractors
Feeling of inequality	Uneven commitment Unequal diversion of risk and rewards Unrealistic expectations (from one party) Persistence of hierarchy between C&C
Unclear definition of partnering objective	No agreed goals/performance measures Misalignment and/or unclearity about the definition of collaboration Exclusion of major sub-contractors in the tenderphase
No (selection on) 'relational fit'	Cultural clash on team/individual level Resistance to integrate cultures Different 'way of working' between parties Use of E-tools instead of face-to-face interaction during procurement
No (selection on) collaborative competence	Traditional procurement procedures (price-only) Focus on project instead of process Inapproropriate procurement strategy (hard focus) Emphasis on economical drivers instead of relational drivers by the client (price-only selection methods)*
Lack of expertise in perfoming collaborative procurement procedures	Communication leads to misunderstanding Lack of (relational) procurement skills/resources Lack of use of collaborative learning techniques Improper knowlegde or unclear definition by the client Client is dependable on suppliers for required data Lack of procurement credibility, los of status Ambiguous/unclear contract clauses Inappropriate planning (of the tender) Lack of standardized procedures
Other (Lack of support)	Bureacratic client organization Neglected interest of own organization Geograpic distance
Overlapping Barrier	
Rules & Regulations	Stringent/incompatibel public sector rules and regulations Potential legal liabilities in resolving non-contractual issues Inability to focus on a continued relation between C&C (due to public procurement law)

Table 3: Barriers collaboration, occurring in the procurement phase

Based on the content of the different studies, seven clear barriers are defined. To start, a 'persistence of own objectives (based on economical drivers)' is shown in strategic behaviour by both contractors and clients, leading to dishonesty and distrust between the actors. This behaviour is frequently shown in opportunistic pricing by the contractors due to commercial pressure, and unrealistic expectations for the provided compensation by the client. The extensive focus on price is shown in price-only selection methods, aggressive negotiation and use of open procedures that facilitate a high level of competition.

The barrier ‘A lack of commitment and mutual specification’ mostly applies to procurement using strict contract specification, in which the contractor cannot show his expertise, which demotivates innovation and creativity. This unilateral form of project specification by the client only, shows a lack of consideration to the contractor and demotivates commitment and a team-working attitude towards the project. The barrier ‘a feeling of inequality’, is mainly caused by transfer of unmanageable risks, unrealistic compensation or the hierarchy that exist between client and contractor during the procurement phase. Additionally, ‘an unclear definition of the partnering objective’ is perceived as a barrier for collaboration as well, which can arise because of misalignment or uncertainty about the definition or perceived value of the collaboration.

The barrier ‘no (selection on) relational-fit’ is shown in tenders that mainly revolve on paper rather than by face-to-face interaction. In the current practises there is a lack of acknowledgement of the value of a good chemistry between client & contractor. Therefore, this theme is almost never addressed in the award criteria. This counts for collaborative competences as well as the award criteria often define financial or qualitative qualities, such as technical competences. Therefore ‘no selection on collaborative competence’ is perceived as a barrier as well. Finally, the barrier ‘a lack of expertise in performing a collaborative procurement procedure’ describes the inability of the technocratic actors within the construction sector to perform a collaborative procurement procedure.

Apart from this main barriers, some sub-factors can be related to a ‘lack of support’, though this aspect is not strongly motivated in literature. A possible reason might be that this topic is perceived as a barrier for collaboration, but not clearly occurring in the procurement phase. Lastly, the rules and regulations in procurement law are often framed as a barrier to commence a collaboration(Eriksson & Atkin, 2009; Rahman & Kumaraswamy, 2005). Though, Dorée (2001), De Ridder (2015), Plane and Green (2012) state that it is the perception of procurement law that results in an overall adversarial, formal or competitive attitude. For this reason, this factor is interpreted as an overlapping barrier for the other barriers.

3.2.4. Relation between barriers and facilitators

This chapter is addressed using a comparative literature study on both the scope and barriers of a collaborative relation. The factors identified in literature are clustered and the relation between both the scope and barriers is analysed. This analysis has been translated into a detailed research model (figure 14), fitting to the originally perceived conceptual model (figure 4).

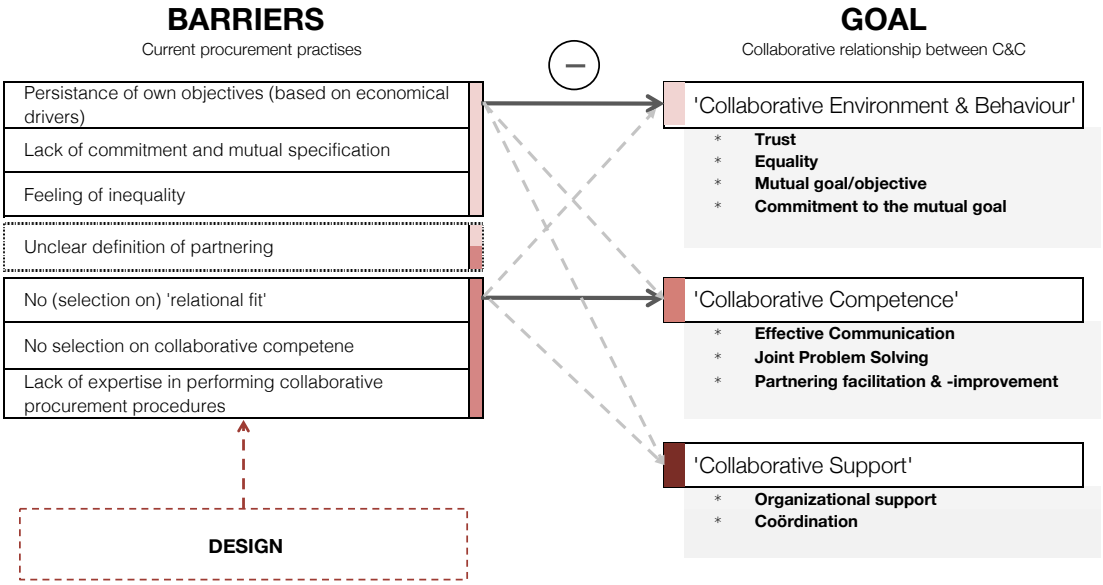

Figure 14: Detailed research model

Figure 14 illustrates the seven main barriers for developing a collaborative relation occurring during the procurement phase. The barrier ‘lack of support’ is intentionally left out of the model as it does not refer to procurement practises in particular. Furthermore, the barrier ‘rules and regulations’, resulting from procurement law, is left out of this model as this barrier refers to the perception of these rules and regulations. This aspect should be seen as a boundary condition and is therefore addressed in the design restrictions. Subsequently, the seven identified barriers form the focus of the design input, the design requirements.

Additionally, the model shows the negative relationships between the barriers and a collaborative relationship supported by literature. Three of the main barriers; ‘persistence of own objectives (based on economical drivers)’, ‘lack of commitment and mutual specification’ and a ‘feeling of inequality’ are perceived to negatively influence the collaborative environment of a project and the behaviour of the future team. The barriers; ‘no (selection on) relational-fit’, ‘no selection on collaborative competence’ and ‘lack of collaborative skills of the involved parties’ are assumed to have a negative influence on the collaborative competence of the future project-team. The barrier ‘unclear definition of partnering objective’ is presumed to negatively contribute to both of these elements, as this barrier obstructs partnering facilitation but also the definition of clear mutual goals. There is no strong relation found between the main barriers and the facilitator ‘collaborative support’. Although, it should be taken into account that the factors within the scope of collaboration are interrelated. Therefore, there exist a relationship between each factor.

4. Phase 2 - Design Input

This chapter addresses the collection of the design input. Four focus groups are utilized to formulate measures that contribute to a collaborative procurement procedure. These measures are clustered into design measures and eventually into design themes. These design themes are translated into concrete check-lists and process-models, which will eventually form the substantive input of the design.

4.1. Introduction to the focus groups

The data collection for this phase consist out of four focus groups, each containing three to four participants. The focus groups are used to brainstorm process measures that will contribute to a limitation of the defined barriers (the design requirements). During the course of the focus groups, a selection of measures was elaborated. Due to the wide focus range, two different sessions (A & B) are held, each covering a different part of this focus, shown in figure 15. Both sessions are held twice. An elaborate protocol of the focus groups and elaboration of the focus groups compositions is added in appendix B.1.

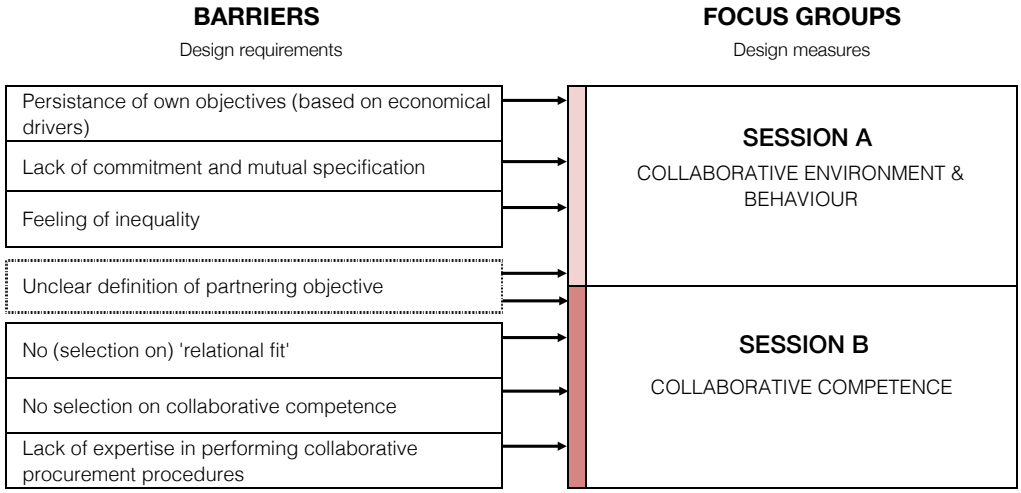

Figure 15: Scope of the focus groups - session A & B

The analysis of the focus groups

The analysis of the focus groups will first address an analysis between the two similar sessions; defining the design measures. Thereafter, a cross analysis will be performed, resulting a clustering of the most important topics that should be addressed during a collaborative procurement procedure, the design themes. All measures that contribute to the design theme will be placed into a check-list or process-model.

Each analysis starts with the transcription of the focus groups, including a mind-map defining different categories within all formulated ideas. The clustering of all categories leads to the definition of the design measures. The categories that were elaborated during the focus groups, play an important part in this clustering process. The design measures are used as codes for a coding process of the transcriptions. Based on the codification, the main content of each design measure is interpreted. Furthermore, some general codes are used, addressing some overall important topics within the focus groups. Sequentially, the cross-analysis follows the same process, clustering the design measures into design themes. The overall findings of focus groups are used to make this clustering. The interpretation of the themes is translated into check-list or process models provided in the final design.

This chapter commences with the overall conclusions of the focus groups. Thereafter, the design measures are described. Lastly, it is explained which themes form the most important topics within the design of a collaborative procurement procedure.

4.2. Design measures

The design input is formulated in design measures. The design measures are derived answering sub-question 2a;

Which measures can increase the potential for a collaborative relation between C&C?

All ideas derived in the focus groups are categorized in mind-maps. These mind-maps are the direct results of the focus groups. Some small changes have been made for structural purposes. The mind-maps underscore which categories were elaborated during the focus groups, and can be found in appendix C.1. All categories are clustered into design measures, which are translated into codes (illustrated in appendix C.2).

A codification process is used to interpret all the following topics for each design measure;

1. All ideas that contribute to this measures;
2. The direction of these measures;
   Some measures are directed to the design requirements (barriers), while others create a general contribution to a collaborative procurement procedure.
3. The perceived effectivity of the design measures;
4. Possible liabilities towards implementation of certain measures within the European Procurement Directive or the existing culture.

An overview of this interpretation is given in appendix C.3.

To start, some overall conclusions of the focus groups are summarized, providing insight to the overall results. Thereafter, the design measures are described based in the interpretation provided in the appendix. A distinction is made between measures that have a more general nature to the entire process and measures that are specifically directed to one of the identified design requirements.

4.2.1. Overall conclusions of the focus groups

During the focus groups multiple ideas were formulated, existing and new, more and less concrete, from quick tools to extensive methods. However, during each focus group, the participants were convinced about the need and realistic opportunity to improve current practises.

Overall, the presence of unrealistic compensation, transfer of unmanageable risk allocation and withholding of relevant information is perceived as biggest cause for a conflicting environment of corruption, strategic behaviour and distrust. Therefore, a collaborative procurement procedure starts with the principle ‘honest work for an honest price’. Participants agree that the client is the role-model concerning this aspect.

It is emphasized that the contract type and risk allocation, which are often defined before the tender procedure, are an important influence on the relationship between C&C. Hence, the contractual agreement has to be aligned with the desired relationship. When a conflicting alignment is present, it is necessary to redefine these agreements during the tender procedure. Overall, it is recommended to always address contractual choices like risk allocation and remuneration schemes during the tender, as a definition of this by the client alone is perceived to increase the chance of conflicts.

Furthermore, the participants underscore the fact that collaboration on its own does not create a valuable contribution. Therefore, the definition of collaboration should always refer to the project and should be beneficial to both parties.

Lastly, the participants of the focus groups clearly emphasize that the execution of a collaboration focussed procurement procedure is beyond the hard culture persisting within the construction sector. Consequently, the client should be willing to invest and in a convincing execution. This requires award or selection on relational criteria. These criteria should have a considerable weights within the MEAT-system to make sure enough effort is put into these elements.

4.2.2. Interpretation of the general design measures

While the focus groups were directly focused on formulating measures that would limit the defined barriers, some topics were named very frequently in relation to almost all barriers. These measures are perceived to create an overall contribution to a collaborative procurement procedure. A compromised list of these measures, extracted from appendix C.3, is provided in table 4. Following, the most important measures are explained.

SESSION A	SESSION B
Honest compensation * Budgeting of the client: An honest price for honest performance * More detailed elaboration of costs in the proposals or interviews * Reasonable tender compensation	
Motivation of obligation to warn/improvement proposals * Active discussion of impossibilities and imperfections in the contract * Extra tendercompensation for improvement proposals	
Facilitation of an informal process * Informal contact route next to a formal one	***Creation of an informal atmosphere*** * No lawyers and negotiators active during the tender procedure * Providing dialogue training for each contractor * Creating freedom for (informal) contact
Focus on values behind actions * Conversation about underlying thoughts (culture, norms, values, intuition, history, interests & expectations)	***Personal contact/ relationship building*** * More contact: Presentation, interviews, dialogues * Informal project excursions * Explicating history and cultural differences

Table 4: General design measures

Honest compensation & motivation of the obligation to warn

To make a collaborative relation work, the procurement procedure should start with the principle 'honest work for an honest price'. Therefore, strategic behaviour concerning unreasonable pricing by the contractors should be demotivated by a realistic price range set by the client and a better elaboration of the costs within the contractors' tender proposals, using interviews or presentations. Additionally, the participants of the focus groups described multiple measures directed to the demotivation of withholding of relevant information.

> *"It is no exception that conflicting contract specifications are identified and notified by the contractors, but neglected by the client during the tender. On the other hand, when profit can be gained from the contractor side, these errors are often only revealed by the contractor after award, when the power position has shifted".*

This form of strategic behaviour should be limited by taking the time to discuss the impossibilities and imperfections in the contract. Motivating the contractor in his obligation to notify these errors and provide improvement proposals can be achieved by granting extra tender compensation for the effort.

Increase of contact & informality

Named in all focus groups sessions, two other general measures were acknowledged as essential fundaments of a collaborative procurement procedure. To start, it is underscored that is necessary to facilitate more interaction between C&C during the procedure.

> *"The only way to be able to perform a procedure that focusses on collaboration and award on this criteria as well, is to create more interaction during the procedure. Individual information rounds, presentations, excursions or informal gatherings, make sure enough time is spent between the client and contractors to get to know each other"*

It is emphasized that contact moments should focus on the underlying values of the parties as well, like culture, history, interest and expectations. Additionally, informal excursions or gatherings can contribute to a more relaxed atmosphere.

The participants acknowledge that the combination of distrust, and the perception of the restrictions within procurement law, often creates a stringent and formal atmosphere during the procedure. This obstructs the actors to behave and perform authentically. Consequently, an effective execution of the procedure, requires the facilitation of a more informal atmosphere throughout the procedure.

> *"The current culture in which the contractors are perceived to be corrupt and client are perceived to be untrustworthy, creates a formal and anxious atmosphere during the tender. However, in principle, 95% of the actors involved in the tenders simply want to contribute to a successful project. If you want this mind-set during your tender, lawyers and negotiators should be banned from the process".*

4.2.3. Interpretation of the directed design measures

Next to the general measures, the focus groups mainly identified measures that directly limit the described barriers for collaboration. A compromised list of this measures are provided in table 5. Following, the measures are explained.

BARRIERS	SESSION A	SESSION B
Persistence of own objectives (based on economical drivers)	***Absence of lowest price incentive*** * Small weight on financial criteria * Minimum and maximum price, fixed price, fixed % * Award on qualitative criteria, price formulation after award	
Lack of commitment and mutual specification	***Pro-active contractor involvement*** * Market consultation * Open contract specifications * Client proposes opportunities for contractors * Further detailing of project after award ***Collective determination of dialogue-schedule*** * Schedule of dialogues is determined collectively * Slow building of dialogue process	***Collective definition of the tender procedure*** * Contractor consultation ***Co-creation of the tender*** * Concretization of project by C&C after award * C&C develop tender submission collectively
Feeling of equality	***Collaborative division/ management of risks*** * Assistance in risk management * Collective division of risks * Discussing the preconditions of the risk allocation	
Unclear definition of the partnering objective	***Collective definition of the formation & attributes of the collaboration*** * Collaborative vision as MEAT-criteria * Evaluating collaboration during dialogues (monitor) * Creating a partnerschip development process * Scheduling a partnerschip development period post-tender ***Definition of the substantive significance of collaboration*** * Conversation about mutual objectives * Collaborative goal as MEAT-criteria * Definition of a partnering objective bigger than the project	***Award on a definition of a partnering objective*** * Inspiring introduction of the clients dream/ambition * Collective definition of a partnering goal * Partnering goal as a contractual incentive
No (selection on) 'relational fit'		***Adaptation of teams on 'relational fit'*** * Focus on training & selection in individual project-teams * Focus on formation of the collective project-teams
No selection on collaborative competence		***Team-assessments*** * Award on interviews, CV's and team references * Team-assessments between C&C
Lack of expertise in performing a collaborative procurement procedure		***Experiencing the opposite perspective*** * Serious gaming used to learn the opposite perspective * Practice and reflection ***Appointing a 'collaboration-functionary'*** * Appointing a functionary to train and reflect on collaboration

Table 5: Directed design measures

Limitation of the lowest price incentive
The persistent practises of procurement on economical drivers rather than relational drivers can be seen in procedures that facilitate a high level of competition solely on price. The chance to win solely on lowest price should minimalized to create room to award on qualitative or relational criteria instead, which is essential for a collaborative procurement procedure. The absence of a lowest price incentive can be created by using a minimum and maximum price, a fixed price or a fixed price margin. Additionally, the price can be formulated after award on quality only (with certain boundaries). Lastly, a small weight can be put on price in the MEAT-criteria. However, this should be done convincingly.

> *"Even in tenders that set a price-quality ratio of 20-80%, contractors are prone to propose extremely low prices for poor qualitative proposals".*

Active involvement of the contractors in the specification of the project
Even though, only session A was directed to formulate barriers to limit the lack of commitment and mutual specification in the current procurement practises, both sessions underscored the necessity to involve the contractor in the specification of the project.

To start, contractors can be consulted on their knowledge and wishes concerning the procurement procedure before the tender start, which is essential for the client to gain the relevant knowledge to define the right procedure. The most direct way to achieve collaboration in the tender procedure is to co-create the tender proposals during the tender, or co-create the project after award, in a development or concretization trajectory. Furthermore, specific solutions can be co-created throughout a dialogue procedure with the contractors. Both measures require an open contract specification that gives flexibility for the contractors to provide innovative solutions. Finding extra opportunities for the contractor can contribute to this aspect as well.

It is underscored that these measures require time, investment and trust in the competence of the contractors. The guarantee of transparency can be difficult in this process. Lastly, it underscored that the definition of the dialogue topics by the client alone is perceived as a non-efficient, demotivating and can possibly cause a feeling of inequality among the contractors. Collective development of the dialogue agenda can possibly improve the commitment of the contractors and contribute to the quality of the tender submissions.

> *"A dialogue process must fill the wishes of a contractors. You start off with a '0-dialogue' to get to know each other. Thereafter, you collectively define the agenda of the other dialogues within a scope set by the client. It is important that the client takes effort to contribute to the process of the contractors".*

Collective risk division & risk management
The most commonly formulated measure to decrease the feeling of inequality relates a fair risk division. The risk allocation of a project is a complex task involving enormous financial consequences. Therefore, it is underscored this allocation should be discussed or even collectively developed in the tender. It is possible to collectively develop a risk division by exchanging and discussing risk-files with the contractors.

> *"In previous tenders, risk-files were exchanged in confidential dialogues between the client and each contractor. This exchange gave a feeling of equality between the parties. Based on a comparison between all risk-files a final risk allocation was presented by the client and discussed with each contractor".*

At a certain point in the tender this division should be fixed, as it should be the same for all contractors. Based on the final risk division, the conditions of this division should be discussed and defined collectively. Furthermore, mutual assistance can be provided in the development of a risk-management plan.

> *"There are risk that are clearly classified under the client's responsibility and risk that classify under the responsibilities of contractor. The grey area in between should be discussed. Although the financial consequence is allocated to one party, delays and repair work necessary to fix a risk event often confronts both parties".*

Giving definition to the collaboration

Additionally, it is indicated that the meaning and value of collaboration has to be defined to achieve the necessary commitment and acknowledgement towards the collaboration. The meaning of collaboration can be defined in one of two ways', by linking collaboration to a substantive significance of the project or to shape the formation and attributes of a collaboration.

All participants agree, the formulation of a partnering objective should be described in a tender product and evaluated in the award criteria. It is underscored that a partnering objective should be found with the mutual objectives between the parties derived after a collective dialogue process. A collaborative goal can be put into a contractual incentive to maintain commitment to the collaboration during the entire process.

> *"In the tender proposal of a DBFM contract for a museum a 'hospitality concept' was designed by the contractor to collectively enlarge the amount of visitors during the exploitation of the building. When successful, the contractor would gain more compensation for the maintenance phase".*

Secondly, it is recommended to collectively shape how the future relationship is organized, who is part of the relationship and which resources contribute to the collaboration. Dialogue on partnership visions or consulting of objective monitors can be used to design how the partnership should be shaped and developed. The development of the collaborative relationship should be realized during a development process after the tender.

> *"In a procurement procedure the client and contractor can never achieve the full potential of a collaboration. Before the project starts and the first conflicts arrive, take a period to develop this relation. The value of this period is often overlooked".*

Team assessments and adaptation

Willingness to assess, change or train a team based on relational competences and -fit is perceived as a relatively underexposed measure within the technocratic construction industry. Facilitation of this process starts by putting more focus on the internal formation of project teams, possibly using tests, assessments, or relationship building activities can make an immense improvement in the potential of a collaborative relation, especially in relatively large teams like consortia.

Chemistry and collaborative competences are almost never used within the award criteria as well. It is acknowledged that the aspects relational fit and collaborative competences can best be evaluated collectively, as they are interwoven. Different forms of assessment can be used evaluative teams based on CV's, references, interviews or tests. A more intensive form of evaluation can be performed during team-assessments during games or actual work-shops, in which teams are assessed on chemistry with the client and collaborative skills. The transaction cost of collaboration assessments is an issue. A limited amount of contractors is therefore desired. However, this form of assessment is not recommended to be used as the only award criteria. An assessment can therefore be used as one of the knock-out rounds during a tender procedure.

> *"Assessments should entail games or work-shops connected to project related-topics, involving real interest, as this challenges the most authentic behaviour".*

It should be realized team assessments cannot only be used as award method, but mostly gain relevant information to shape and train the collective team as well. A further step in shaping the collective team is therefore a valuable next step.

Gaining the expertise to collaborate

Lastly, it is emphasised that a lack of soft expertise within the contractor- and client-team requires investment in training and evaluation. To start, it is acknowledged a collaborative procurement procedure should focus on explication of cultural differences, responsibilities to the mother organization and history. Serious gaming can also be used to learn the opposite perspective. Furthermore, increased effort should be put in evaluation during the tender process. As a concrete measure, this could mean two actors from both the client- and contractor-team are appointed to reflect on collaboration during workshops or dialogues, perform feedback-rounds in their teams and take action to train the actors and maintain a well working collaboration within and between the teams. In the last case, interaction between the two internal functionaries is desired and is perceived to have extensive value to the execution of a well-working collaborative procurement procedure.

4.3. Design themes

The design themes define the most relevant topics that require investment within a collaborative procurement procedure. The following sub-question is answered;

Which themes should be addressed within a procurement procedure to increase the potential for a collaborative relation between C&C?

A cross-analysis of the design measures has resulted in the clustering of seven design themes, illustrated in appendix D.1. During the clustering process, some overall conclusions within the focus groups were taken into account. These design themes describe the most relevant topics or processes that should be facilitated during a collaborative procurement procedure. In the interpretation of these themes, derived by using a coding process, it is acknowledged that a collaborative procurement procedure can be built by one, two but also by all seven themes, using various measures, and performing them in different intensities. Therefore, the design will not illustrate a standardized procedure, but a choice model, in which various approaches can be chosen.

For this reason, the themes will be translated into check-lists and process-models, which describe all different measures that can be used to address that theme. This models form the substantive basis of the design.

4.3.1. Interpretation of the design themes

Most ideas formulated in the focus groups are developed to limit one of the identified barriers (design requirements). However, it is analysed that some design measures are closely related and contribute to the limitation of more than one barrier. Additionally, the focus groups have identified measures that are not directly related to the barriers, but play a fundamental role in performing a collaborative procurement procedure. For this reason, the two types of themes are distinguished;

1. *Fundamental themes;*
   These themes are constructed based on the design measures that create general contribution to a collaborative procurement procedure. They are identified to be essential to the performance and effectiveness of the other measures.
2. *Directed themes;*
   The four directive themes are specifically focussed to one or more of the barriers. These themes provide different measures in the preparation-, selection-, award- and post-award phase of the tender, which thereby steers the procedure.

The design themes, and their relation to the barriers, are shown in figure 16.

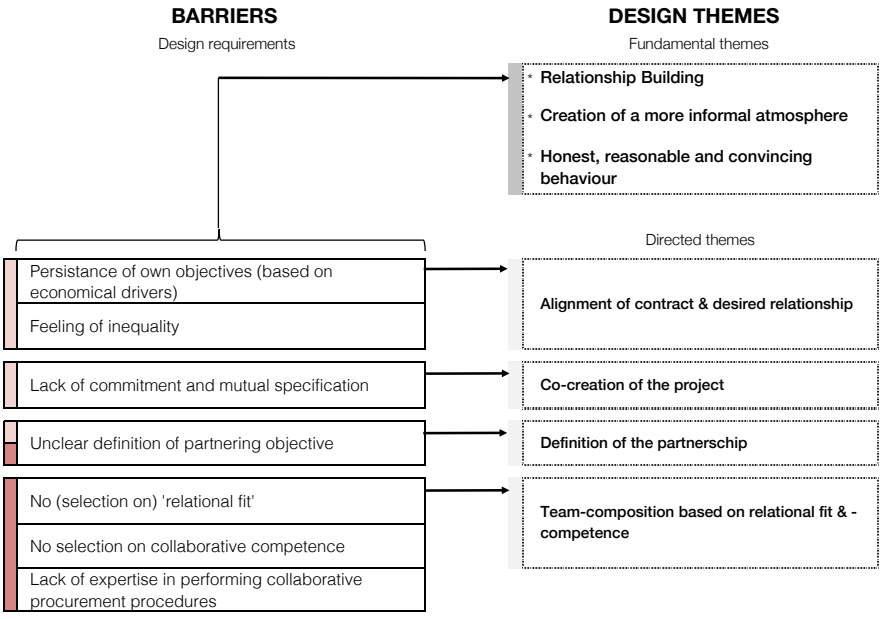

Figure 16: Design themes

Following, both the fundamental- and directed themes are elaborated, focussing on their perceived contribution to a collaborative procurement procedure.

Fundamental themes
Concluding from the focus groups, the general measures that are clustered within the fundamental themes do not directly relate to the identified barriers form literature, but do relate to the implications of the technocratic culture, the limited perceptions of possibilities within the Procurement Directive overall environment of distrust and strategic behaviour. Three themes are identified;

- The theme 'relationship building' describes facets like increased contact moments between C&C, experiencing the perspective of the opposite party and explication of underlying values. Named in both sessions, these measure are perceived as an essential part, you can't escape when performing collaborative procurement.
- Formal and preserved behaviour due to an exaggerated perception of the limitations of procurement law is acknowledged to obstruct the effectiveness of other collaborative measures. For this reason, the theme 'the creation of an informal atmosphere' is essential to make a collaborative procurement procedure work. Informal contract moments and limitation of juridical actors is recommended.
- Another recurring topic within the focus groups is that such a new form of procurement requires a convincing performance to succeed, as existing habits are persistent. Therefore, 'honest, reasonable and convincing behaviour' is required. This theme involves measures like motivation of the obligation to warn, honest (tender) compensation and convincing weights on relational award criteria.

Directed themes
Concluding from the focus groups some measures are identified that are clearly directed towards one or more of the identified barriers. Thereby, they cover the facilitation of a certain element of collaboration. These measures are clustered in four directed themes.

- The persisting focus on own (economic) objectives, prone to result in unbalanced compensation and risk-allocation, is acknowledged as the most destructive basis for a relation. These aspects lead to a feeling of inequality and strategic behaviour. The theme 'alignment of contract and desired relation' addresses measures like collective risk allocation and absence of the lowest price incentive. This last measure offers room to award on other (relational) criteria instead. Therefore, this theme is perceived to complementary with the other themes. The focus of this theme is to make sure that the procurement procedure is used to collectively discuss the contractual agreements made in the tender.
- The barrier 'lack of commitment and specification' can be limited by performing different forms of co-creative measures before, during and after the procedure, described in the theme 'co-creation of the project'. Participants perceive these measures to be an effective tool to increase the contractors' commitment and a feeling of acknowledgement. The combination of the collaboration and substantial development of the project is perceived to fit the hard character of the building sector.
- The theme 'definition of the partnership' can be accomplished by shaping the form and attributes of the partnership or by defining a substantial goal for the partnership. These measures limit the appearance of the barrier 'an unclear definition of the partner objective'. While this theme is perceived as important, convincing utilization might be difficult and requires collective decision-making. The pitfall of this theme is the development of standard proposals that are forgotten after award.
- It is perceived that possession of relational fit, -collaborative competences and -the expertise to perform a collaborative procurement procedure are interrelated and cannot be easily addressed apart. The theme 'composition of a team based on relation fit & -competences' describes the use of assessments, monitors or training to select and develop a well-functioning team. However, relational competences should be balanced against technical competences. Therefore, implementation might be difficult or ineffective.

Translation of design themes
The fundamental themes are translated into check-lists providing measures in different levels of intensity. The directed themes are translated into process-models providing measures within different approaches and different intensities, during the different phases of a procurement procedure.

-The check-lists and process-models are described in the design in chapter 6 for structural purposes-

5. Phase 3 - Evaluation

During the evaluation phase, an expert panel is consulted to validate the design themes, and the measures they describe. First, an introduction to this expert panel is given. Secondly, the results of this panel are discussed.

5.1. Introduction of the expert panel

The design themes including the check-lists and process-models describing all applicable measures, are evaluated by means of an expert panel. This expert panel exists out of six participants, previously engaged in the focus groups.

During a presentation the panel is asked to formulate their opinion on each of the design themes. Two panel rounds are performed; the first referring to the three fundamental themes, the second to the directive themes. The participants are asked to formulate their opinion on three criteria;

1. The effectivity of the themes concerning the research goal; increasing the potential of collaboration between C&C after the procurement phase;
2. The feasibility of implementing the themes;
3. Their preference in applying the themes.

These criteria are selected to respectively enhance validity, reliability and generalizability of the design.

The opinion of the participants is gathered by means of a scoring form, including the ranking of each criteria. Furthermore, a notification of this opinion, improvement points or opportunities concerning the themes, or specific measures within the themes, are acquired. On the basis of this scoring form, a discussion is held. An elaborate explanation of the expert panel is added in appendix D.1.

Analysis of the expert panel

The ranking scores are added in appendix D.2. The notes and discussion is put into a transcript for analysis. A summary of the most important topics is provided in the next paragraph. An important note is that the ranking, elaboration and discussion do not contribute to a full validation of the themes as the amount of participants is too small. The expert panel is therefore not consulted to transform the themes, and developed check-list and process models. However, the panel is used to validate the interpretation of these results and define the critical points concerning the effectivity, feasibility and preferences within a collaborative procurement procedure. These two aspects will contribute to a sharper recommendation within the design.

5.2. Evaluation of effectivity, feasibility and preference

An evaluation of the design themes and the constructed check-list or process-models validate the interpretations that are made and grant insight in their perceived potential. Sub-question 3a is answered;

How do the users perceive the potential (effectivity, feasibility and preference) of the design themes for a collaborative procurement procedure?

The most important findings concerning all three criteria are discussed.

5.2.1. Effectivity

The effectivity describes the extent to which the design themes contribute to the defined goal; increase of the potential of a collaborative relation between C&C after procurement. A positive perception of this criteria contributes to the validity of the design.

Most effective themes & sequence of the procedure

The overall effectivity of each theme is highly valued. It is perceived that the worst and most persistent barriers within the current tender practises are unbalanced compensation and –risk allocation. These barriers should be addressed first, to enable a collaborative procurement procedure to be successful. Strong economic interest will always be essential within a client-contractor relationship. Therefore, a contractual agreement provoking strategic behaviour concerning these interests cause all other measures to lose their effectivity.

> *"There are projects that address almost all topics that result from the research in their procurement procedure, but get into conflicts anyway due to the risk allocation. Therefore, all themes are 'nice-to-have' but fair conditions, and talking about this conditions, is a must-have"*

Therefore, the themes 'honest, reasonable and convincing behaviour' and 'alignment of contract & desired relationship' are acknowledged to be most effective. The measures within the themes 'relationship building' and 'creation of an informal process' are acknowledged as essential elements to achieve a convincing behaviour. The participants acknowledge investment in the three other themes should be utilized as additional measures. Between all three, 'co-creation of the project' is valued most effective. This incentive can directly pursue a collaborative environment and create a different positioning between the parties.

Indirect and direct themes

The panel accentuates that the fundamental themes have an indirect contribution to the research goal. This observation is in coherence with the interpretation of these themes. They form the basis of a collaborative procurement procedure. The panel has underscored that it is necessary to use the directive themes as well, as they create a direct improvement of the collaborative potential.

Loopholes

'Team composition based on relational fit and -competences' is mostly effective when applied to both the contractor and client, preferably in the collective team as well. Furthermore, investment in teambuilding activities with multiple parties seems rather inefficient. Intelligent utilization of contact moments is therefore significant. Additionally, these themes are only effective when the tender teams continue in the execution phase. Overall, the effectivity of each themes increases when applied in tenders for contractual relationships with a longer lifespan or a more intense form of partnership.

5.2.2. Feasibility

The criteria feasibility defines the extent to which it is possible to implement the measures within the design themes. This knowledge contributes to the extent to which the design can be perceived as reliable in all circumstances. Overall feasibility can relate to various topics;

- Feasibility concerning the required investment (money, time and energy);
- Feasibility concerning the capabilities and culture of the performers;
- Feasibility concerning the implementation within procurement law.

The last topic will be discussed separately as this topic is perceived to be one of the main barriers to implement a collaborative procurement procedure. Further research was performed to define the critical issues and key improvement areas within this topic.

Overall feasibility

The overall feasibility of the measures named in the fundamental themes is perceived positive as are the additional measures named within the directive themes 'definition of a partnership' and 'matching the contractual agreement'. Though the other two themes offer some loopholes. Overall, there is more criticism concerning this criterion in comparison to the effectivity.

Investment

The required investment concerning the theme 'relationship building' is a critical issue. Conversation about underlying thoughts and values is perceived as important but requires some preconditions and time-investment to avoid inducing unwanted effects. Most measures within the theme 'co-creation of the tender' require a large amount of time, money and energy from both parties. 'Team-composition based on relational fit and -competences' does probably only work in specific collaboration-oriented contracts. Even in these forms of partnerships, the willingness to replace or shift employees based on chemistry will be little, as this action will result in information loss (especially at the clients' party).

Culture

The most critical feasibility issue is caused by an existing culture of closed behaviour and a lack of trust between the client and contractors. A convincing performance of a collaborative procurement procedure cannot only be achieved with a higher compensation and award on relational criteria. It also requires a convincing behaviour and believe in the procedure. This obliges a considerable shift within the openness and attitude of the executors. Furthermore, it is emphasized that procurement will always have a hard and competitive side as well. An optimal balance between these contradictions is difficult to find.

5.2.3. Implementation in the European procurement directive

The design of a collaborative procurement procedure is created for utilization within European Procurement Procedures in the construction sector. Therefore, the measures described within the themes should be in coherence with the laws and regulation of the European Procurement Directive. Concluding from the focus groups and expert panel, the following measures create conflicts concerning this directive;

1. **The creation of informal contact creates conflicts with the equality and transparency principle.**

Hoezen (2012), and the participants of the focus groups have emphasized that while informal contact is certainly possible within a tendering procedure, risk-adverse parties are often reluctant to use it. The boundaries of procurement regulations are perceived as more severe than the actual implications of them. The acknowledgment this misperception is required for better effectuation of informal processes.

Hoezen (2012) has done extensive research on the linkage between informal and formal processes within the Competitive Dialogue Procedure. The results of this study state an informal and formal process should serve as complements and cannot be used as substitutes within a tender process. Informal contact serves to sense the environment and form expectations. Formal contact serves to translate this observation and expectation in a common consensus and eventually a formal agreement. Implementing a constant linkage between the informal and formal process provides that formal agreements can be used to guarantee the level playing-field. The client should be well aware of this step and effectuate it to provide information symmetry among the different parties. Furthermore, it is notified that a more effective linkage in informal and formal processes can be achieved can be achieved in concretization phases after award, often used in BVP (Hoezen, 2012).

2. **Evaluation on relational fit create liabilities concerning the principle of objective motivation**

During the focus groups it was acknowledged that award on relational fit is prone to create problems in providing an objective motivation. However, there are plenty of possibilities described to make an objectified evaluation on less concrete criteria, such as assessment panels or validated tests. Therefore, it is acknowledged that this concern is mostly applicable to the uncertainty on how relational fit can be measured. Following Kadefors et al. (2007) it is recommended that selection or award on relational fit requires experts in this area to prepare but also perform these forms of evaluation, as this should not be done by the client itself. It is perceived that these evaluations create a double benefit, as the involved parties gain awareness of their own behaviour in reference to certain strategies. However, it is also stated further research is required on this topic.

3. **The use of co-creative measures creates issues concerning the equality and transparency principle.**

Because co-creation always involves substantial development of the project, this measure inevitably develops information asymmetry between the different parties. To guarantee a level playing-field, all information sessions need to be translated in process transcription, which makes this measure very inefficient (Pianoo, 2016c). The most convenient solution is to perform co-creation outside of the competitive tender procedure. However, co-creation before the tender is prone to commitment issues as the contractors have only limited interests in the process. Co-creation after the tender requires trust in the expertise of selected the contractor.

Another solution can be found in using procurement as a development procedure, as is the case in an Innovative Partnership Procedure. In this procedure, the competitive phase is used to determine the framework of a development phase and select one or more contractors that provide the best business case for this development. Thereafter, a co-creative development phase takes place under temporary contracts with a limited amount of contractors. At the end of the contract (which can be divided in different parts), all parties can decide to continue or not. The final selection is based on a project proposal (Pianoo, 2016d). However, this form of procedure creates new liabilities concerning flexibility in stepwise selection, contractual change and intellectual property rights. Therefore, this topic requires more support within the Procurement Directive.

4. **(Re)definition of the contract specifications or during the tender, or price after the tender, can result in essential change.**

Essential change is a crucial topic within collaborative procurement, as multiple measures refer to the (re)definition of contract specifications. There are strict rules to the tolerance of change during or after procurement (described in paragraph 3.1.2.). However, it's possible to create flexibility by defining rules and processes for this foreseen change or using flexible contract specification in the first place. Consequently, to overcome this liability, a good preparation of the tender procedure, concerning the flexibility of the contract, is essential.

5.2.4. Preference

The potential of the design themes is not only defined by the effectivity and feasibility of the design. The preference in utilizing the measures defined in the themes within a collaborative procurement procedure is an important criteria for the potential of the design. A positive preference adds to the generalizability of the design.

The preferred implementation

The full range of fundamental and directed themes is positively assessed by the expert panel to be used within a collaborative procurement procedure. It is accentuated that it is required to make choices between all measures in each theme. However, next to the fundamental themes, more than one of the directed themes should be used at the same time when the goal is to make a real difference. After the utilisation of the most preferred theme 'Alignment of contract & desired relationship', 'co-creation of the tender' is preferred most within the directed themes.

PART THREE
THE RESULT

6. The design

This chapter reveals the design of a collaborative procurement procedure, the objective of this research. To start, a conclusion of the execution phases is given, proving insight to recommendation of the construction of a collaborative procurement procedure. Thereafter, the design is introduced relating this recommendation to substantial themes and measures that can be utilized. These measures are provided in check-lists and process-models and explained per design theme.

The research objective describes the formulation of a concrete design for a collaborative procurement procedure, as the absence of tools on this particular topic is part of the defined problem definition. By providing the design of a collaborative procurement procedure, the research question is answered;

How can the potential of a collaborative relation between client and contractor be increased throughout the procurement procedure of a construction process?

The recommendation for the construction of a collaborative procurement procedure will be based on an overall conclusion of the execution phase; the literature study (the design starting point, -restrictions and -requirements) the focus groups (design measures and design themes) and expert panel (validation). This recommendation is translated into the design.

The design is structured as a comprehensive choice-model, as a standardized procedure does not fit to project-specific procurement practises. Therefore, the design offers multiple approaches which will all be explained.

6.1. Conclusions execution phase

On the basis of the literature study, the focus groups and the expert panel, the following conclusions have been derived, recommending how a collaborative procurement procedure should be constructed.

1. **A collaborative procurement procedure requires a certain fundament to enable the procedure to work, and more facilitative measures to directly enlarge the potential of collaboration;**
   - Measures within the fundamental themes; informal gatherings, limitation of lawyers during the procedure, or fair tender compensation, are perceived to be essential tools to enable the performance of a collaborative procurement procedure. Hence, they have a very indirect contribution to the facilitation of collaboration. The use of more facilitating measures like for example; defining partnership objectives, assistance in risk management or co-creation of the tender proposals, have a more direct contribution to the goal. For an effective collaborative procurement procedure, the construction of a procurement procedure requires both types of measures.

2. **A collaborative procurement procedure starts by increasing trust and demotivating strategic behaviour;**
   - Within the current practises it is indicated, that a collaborative procedure has to start with the limitation of the most persisting barriers for collaboration; distrust between the client & contractor and strategic behaviour. Distrust and strategic behaviour are mostly caused by unfair conditions like unreasonable expectations for the given price (range) or transfer of unmanageable risks. The themes ‘honest, reasonable and convincing behaviour’ and ‘alignment of contract & desired relationship’ relate most strongly to the limitation of these causes. Therefore, it is recommended to invest in these themes first.
   - However, it is emphasized that a collaboration is not created by solely limiting these barriers. To really launch a collaboration, focus on factors like team composition, definition of the partnership and collective development of the project is relevant as well.

3. **The design should be seen as a range of options, in which a tailored and founded selection is required;**
    - The use of collaborative procurement measures should fit the project characteristics, the wish of the client and the situation.
    - The measures that are provided in the design should always be tailored into the context of the project, as this is still the main focus of the tender procedure.
    - An equilibrium should be found between the initial investment in collaborative procurement and the profit gained from the future collaboration. This does not only imply the compensation of transaction costs within the procurement procedure. It also refers to the balance that should be found between the relational-, technical- & financial criteria within the tender selection and -award (Pesämaa et al., 2009). Collaborative procurement can only work when the client is willing to invest (Eriksson, 2010).
    - The possibilities within collaborative procurement are broad. Some ideas contribute to one another, some ideas rule each other out. Though in all cases, not all ideas should be used in one procedure. A more directed choice of measures can contribute to the effectivity and feasibility of the procedure.

4. **The construction of a collaborative procurement procedure should be embedded in the existing procedures following the regulations of the European Procurement Directive;**
    - The design should be seen as a pallet of measures that can be chosen from. When chosen, this measures should be embedded in the existing procurement procedures.
    - The measures must be executed in coherence with the European Procurement Directive. Multiple measures create liabilities concerning the guarantee of this regulation (which will be notified in the design). In this case, a good preparation can limit this liability.
    - In dealing with the comprehensiveness of executing multiple measures in the award phase, it should be emphasised that different criteria can be used next to each other. However, collaborative procurement might benefit from using more award steps, using knock-out systems. Evaluation on too many criteria can cause the least important criteria to lose their effect. When using multiple award rounds, these criteria can be addressed in different steps. This facilitates the possibility to decrease the amount of participants as well, which is relevant for measures that require high investment.

5. **The use of collaborative procurement requires a daring, congruent and future-focussed behaviour to be effective;**
    - Collaborative procurement does not directly increase collaboration during the procurement procedure. Although, it is not impossible to create some form of collaboration during the procurement phase, the key improvement area is to facilitate this after the procurement phase. The client should dare to invest in future profits (Eriksson, 2008).
    - All measures should formulate a congruent ensemble to prevent inducing undesired behaviour.
    - A collaborative procedure obliges a considerable shift within the openness and attitude of the executors. The involved parties should be willing and daring to let go of the existing culture and perception of law and regulation.

6.2. The design of a collaborative procurement procedure

The design offers a choice-model (existing out of several themes), which can be used to create a collaborative procurement procedure. Based on the design themes and overall conclusions, the following overview model is derived, giving a recommendation to how a collaborative procurement procedure should be constructed. Thereafter, this model is explained. Subsequently, all choices within the design are elaborated.

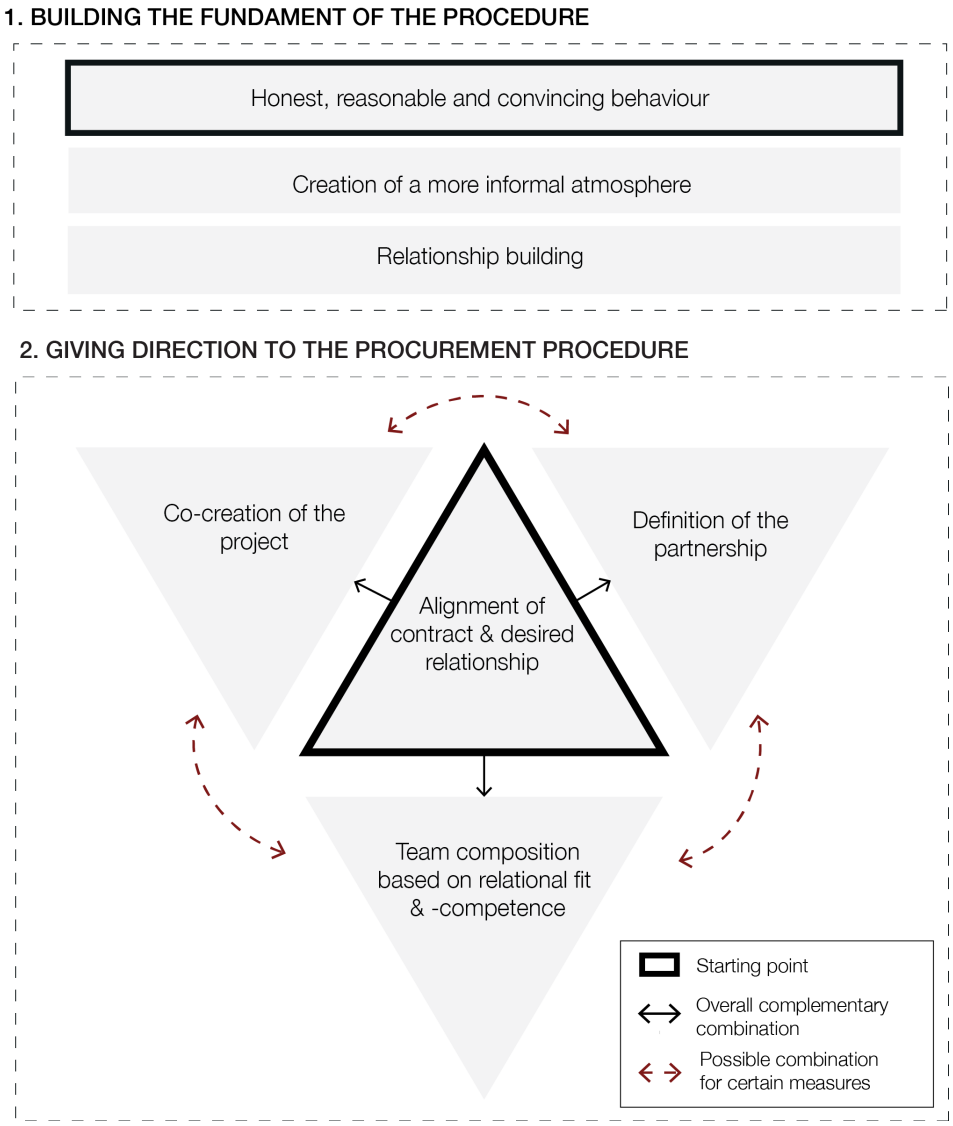

Figure 17: Overall design for a collaborative procurement procedure

A collaborative procurement procedure can be constructed by performing extra measures throughout the existing steps of a procurement procedure. Following figure 17, this construction should be performed in two steps; (1) building a solid fundament to enable the procedure to work effectively, and (2) giving direction to the steps of a procurement procedure with measures that cover the facilitation of a certain element of collaboration.

Step 1: Building the fundament of the procedure

The composition of a collaborative procurement procedure starts by building a fundament of increased trust and demotivation of strategic behaviour. Illustrated in figure 17, this starts by investing in measures that fit a 'honest, reasonable and convincing behaviour'. This involves measures that motivate transparency about errors in the contract and convincing weights for relational criteria. However, this behaviour should also reflect to the conditions that are set in the tender, like an honest

price range in which the contractor can make their proposals. As collaboration can never work in an environment of unreasonable expectations or dishonesty, investment in this theme is most essential.

Next to this a solid fundament should be built by investing in relationship building and the creation of an informal atmosphere. A more informal setting, in which the parties know and recognize one another, facilitates more intensive measures like dialogue processes or even co-creation to work considerably better.

Although these themes have a rather indirect effect on the enlargement of the collaborative potential of the future relationship, they enable other measures, that do create a direct effect, to work.

Step 2: Giving direction to the procedure
A collaborative procurement procedure also requires measures that give direction to the procedure during the preparation-, selection-, award- and post award phase. During this phases, consultation, dialogues and the post award phase can be used for the client to connect with the contractors on certain topics. Furthermore, the selection- and award criteria can be used to evaluate on relational criteria. Four themes have been derived that directly improve the potential of a specific element of collaboration throughout the procurement phases.

The first theme describes a collective 'alignment of the contract & desired relationship' during the tender procedure. It is perceived that a definition of the contract type and risk allocation by the client alone, and high competition on price, is prone to attract strategic pricing and transfer of unmanageable risks. These are the most common conflicts within the construction sector. Investment in this theme, in which collective definition of contractual conditions and award on quality instead of price is central, can create a great contrast with the current procurement practises. Increase of transparency about the conditions and price, can effectively motivate trust and demotivate strategic behaviour. Therefore, investment is in this theme is highly recommended.

Investment in this theme is recommended to be combined with one or more of the other themes;
- Investment in 'co-creation of the project', entails involvement of the contractors in the specification of the project, which can enlarge the contractor commitment to the process.
- Measures within the theme 'definition of the partnership' can be used to give meaning to the collaboration, which can improve the value and functioning of the partnership.
- The theme 'team-composition based on relational-fit & -competences' addresses measures that facilitate the selection and training of teams based on soft competences and chemistry between the client and contractor.

These themes can be used to further shape the process and create a valuable contribution to elements of collaboration as well. The perceptions of effectivity, feasibility and preference are diverse, resulting in an overall similar potential.

All themes can be addressed by different measures, in different levels of intensity. It is essential to make choices between the different measures and between the different themes, based on the provided recommendation, the project characteristics, the preferred intensity and goal of the procedure. A focussed choice can increase the effectivity and feasibility of the procedure.

The following paragraph provides an elaborated description all the choices provided in the design.

6.3. Choices within the design

For each theme the following topics will be discussed, providing tools for the construction of a collaborative procurement procedure;

1. The perceived effect of the theme;
2. Elaboration on the measures that can be chosen from;
3. Reflection towards the perceived design starting point and -restrictions, discussing the feasibility of the measures.

6.3.1. Building the fundament of the procedure

Three themes are perceived to be essential to a solid fundament of a collaborative procurement procedure. Overall, these themes provide measures that can be applied in all procedures, without the exclusion of certain other themes or measures.

1. Honest, reasonable and convincing behaviour

Following the participants of the focus groups, a convincing collaborative procurement requires two minimum conditions. Firstly, both parties should show reasonable, respectful and honest behaviour, in which the clients serve as role-model. Unreasonable pricing, -tender compensation or -expectations can immediately result in a conflicting relationship, in which the opposite party is prone to compensate his disadvantage by strategic- or claiming behaviour. Secondly, the relational measures that are taken during the procurement procedure require investment and a convincing attitude.

Reasonable and respectful behaviour starts with an honest and open mind-set towards input from the opposite party. As impossibilities and imperfections are inevitable within the tender procedure, this topic cannot stay undiscussed or unchanged when present. The client should therefore actively motivate the contractor in his obligation to warn or chance to provide improvement proposals, from the start of the procedure. Explicitly discussing this topic and compensating the extra work put in providing improvement proposals can contribute to this motivation. Secondly, a committing relationship should be awarded with an honest price and a fair tender compensation. As the source of the price and transactions cost often stay undiscussed, increased foundation of this cost by means of interviews and presentations is necessary to acknowledge each other's work and costs.

Figure 18: Check-list theme 'honest, reasonable and convincing behaviour'

> *"When contractors submit a low price they are accused of strategic pricing. When they submit a higher price, they are accused of pricing 'air'. Utilize presentations and interviews to collectively verify where these costs are coming from and what quality will be delivered for the formulated price".*

It should be emphasized that motivation of honesty from the contractors can only go so far. However, as the client creates the conditions of the tender, he can serve as role-model. Lastly, a convincing performance of a collaborative procurement procedure should be visible in the use of considerable weights for relational-criteria.

Reflection to the design starting point and -restrictions

The awarding mechanism MEAT used within European procurement already obliges the use of both qualitative and financial criteria. Subsequently, the weights of the qualitative criteria, which can contain relational factors, should be balanced with financial criteria. Concerning this balance, it is underscored that when the largest incentive is put in lowest price, contractors will not invest in the relational criteria,

but just focus on achieving the best price. The feasibility of this themes is therefore mainly suppressed by the culture within the construction sector. A change in attitude is required for this theme, and thereby the whole procedure, to be effective. This change requires courage as the current trust relation is between C&C is unfavourable. Emphasis on openness and recognition off the interest of the opposite party is recommended, when wanting to achieve this change. This should be pointed out to the contractor as well.

2. *Creation of an informal atmosphere*

It is perceived that parties show anxious and formal behaviour within the tender procedure due to risk-adverse behaviour concerning procurement law. This environment forms a clear obstacle for the execution of a collaborative procurement procedure. The creation of an informal atmosphere is therefore stated as a fundamental part of collaborative procurement procedure, and should therefore be invested in early on in the tender process.

> *"Sometimes the decision whether the information rounds are held individually or collectively takes ages, based on risk-adverse behaviour. However, I have also taken biking tours around the project site during the information rounds. This can easily be done and creates a whole other atmosphere".*

The creation of an informal process can either be achieved by facilitation of more informal contact or limitation of the formal atmosphere. Informal contract can be facilitated by using small informal gatherings around the formal appointments or excursions. Both C&C should be able to utilize an informal route to ask questions, place concerns or discus non-competitive issues. This form of contact could limit the detached environment between the client and contractors during the tender procedure. To directly decrease the formal atmosphere of the tender procedure, the use of intermediate (juridical) actors should be limited, especially during direct contact moments between C&C. Providing dialogue training (to the contractors) can increase an informal atmosphere as well.

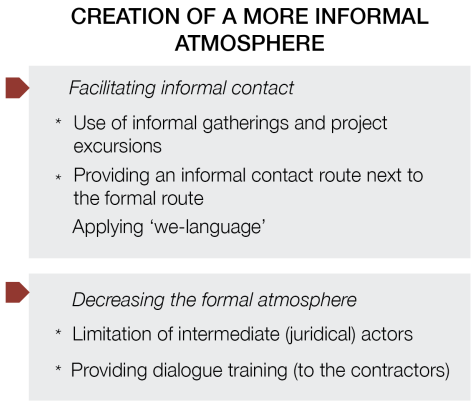

Figure 19: Check-list theme 'creation of a more informal atmosphere'

Reflection on the design starting point and –restrictions

This theme is acknowledged as a result of a disproportionate perception of the limitations of the European Procurement Directive. Hence, it is perceived this theme can be achieved, but is less feasible due to risk-adverse behaviour from clients. The acknowledgment of this misperception is required for better effectuation of informal processes. Following Hoezen (2012), informal processes can be present in the tender procedure, but should never substitute the formal process. It should be acknowledged that the formal process has the function to guarantee an equal process for each contractor. Therefore, informal contact (used to sense and form expectations) should always be translated in formal agreement (a common consensus), which should be shared with all participants. The client should be well aware of this step to guarantee a level playing-field.

3. Relationship building

One of the essential conditions to perform a collaborative procurement procedure is to create more interaction between C&C within the procedure, as measures like co-creation, collective dialogues and award on relational criteria cannot be achieved without contact and can work considerably better when parties know and understand each other. Consequently, relationship building should be invested in, during the early stages of the procedure. Relationship building can be performed to in different intensities, from informal gatherings and formal meetings to really learning the underlying values of the opposite party. The extent to which this investment is made should be based on the intensity of the tender procedure.

Facilitation of increased contact between C&C is essential to get to a higher level of collaboration. A limitation of the amount of participating contractors can make these measures more feasible. The basis of relationship building starts by using face-to-face (formal) meetings and preferably facilitating informal gatherings or an excursion. When a certain level of trust is build, increased focus should be directed to the norms and values, history, responsibilities but also the interest and expectations of the teams, as this forms an underexposed topic within the construction sector. Serious gaming can be used to experience the opposite perspective. Understanding of each other's reasoning and situation is essential to the development of a relationship. Lastly, evaluation and reflection moments during dialogues, interviews or presentations can be used to improve the tender processes as well, which actively builds the first steps to collaboration.

Moreover, the project-team should take a period directly after the tender procedure to further develop the relationship, as this cannot be fully achieved within the level playing-field during the tender procedure.

Figure 20: Check-list theme ' relationship building'

Reflection on the design starting point and -restrictions

Although the existing procurement procedures, the Competitive Dialogue- and Negotiation Procedure already motivate more contact moments within the tender procedures, these moments are mostly used for substantial discussions. Next to this form of contact, more relational focussed contact moments should be facilitated. This theme faces similar feasibility issues as the previous theme. Focus on team continuation is pre-requisite for this theme to be effective. At the start of the tender, this necessity should be announced to the contractor as well.

6.3.2. Giving direction to the procurement procedure

Additional to the fundamental themes, four different directed themes are explained, which can be selected to give direction to the collaborative procurement procedure.

1. Alignment of contract & desired relationship

The contact type, and risk allocation, and remuneration of the contract are an important part of the figuration of the desired relationship between C&C. These choices are made by the client before the procurement phase and are beyond the scope of this research. However, unmanageable transfer of risks, unrealistic prices and fine-mechanisms are the most frequently appearing conflicts with a procurement procedure, prone to ruin the potential of collaboration. Therefore, in collaborative procurement, these contractual topics should be discussed collectively within the procurement procedure, to create a fair consensus between both parties. Furthermore, the incentive to win on low price should be minimalized to decrease the chance of strategic pricing by the contractor.

As the measure within this theme have a direct effect on the potential of collaboration, and steer the procedure, this theme is not perceived as a fundamental part of collaborative procurement. However, this theme is perceived as most effective of all themes. Therefore, investment in this theme is strongly recommended. Furthermore, the theme can be used well in combination with the other three directive themes, as the absence of a lowest price incentive creates room to award on other (relational) criteria instead. All measures are shown in figure 21.

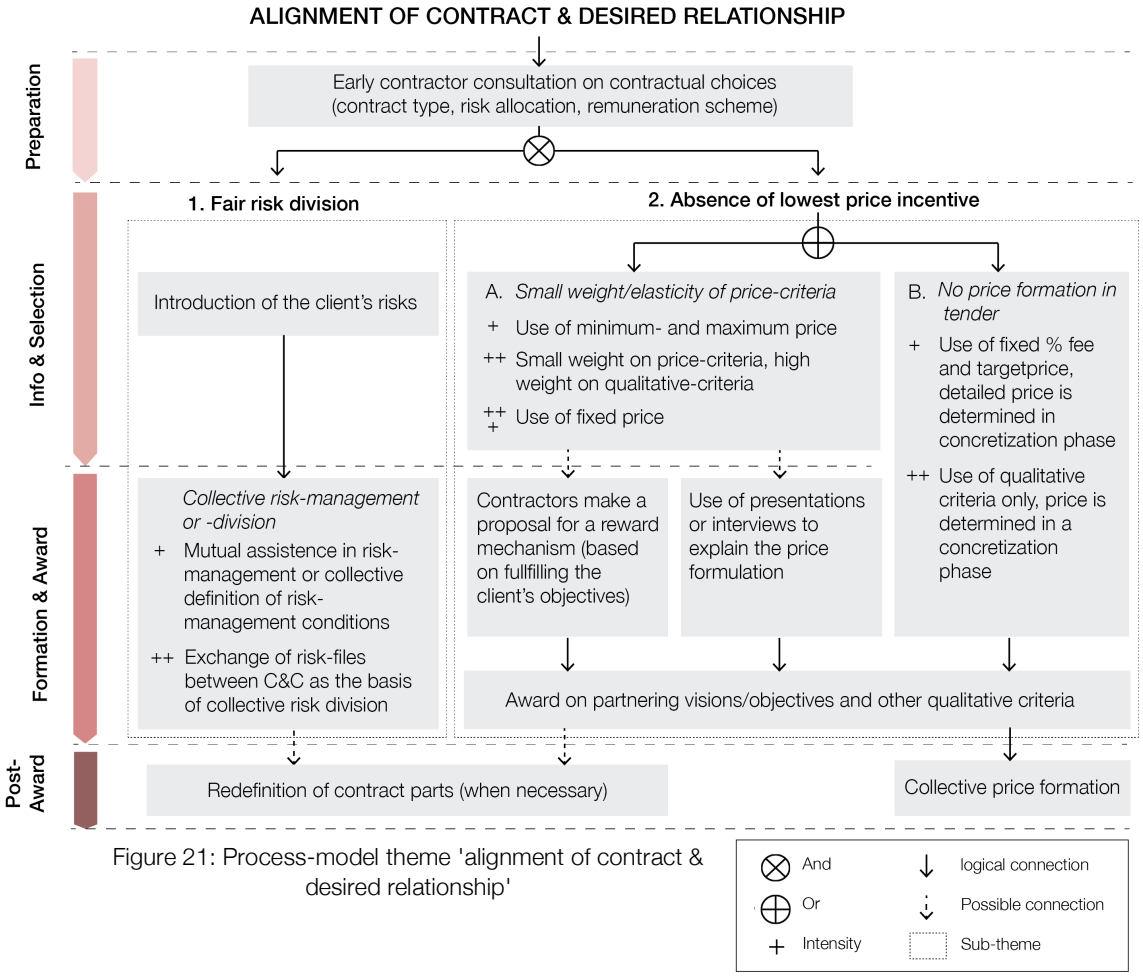

Figure 21: Process-model theme 'alignment of contract & desired relationship'

Following the model, the client can decrease the chance of defining contractual choices that are in conflict with the desired collaborative relationship by performing contractor consultation in the early stages of the procurement phase. Relational choices like, contract type, risk allocation and remuneration should be discussed.

> *"When a DBFMO contract is desirable but the standard risk-allocation that comes with it creates an unmanageable sum of risks for the contractor, the client should not hold on to this diversion rigidly. In complex cases, the division, conditions and management of risks should be discussed proactively but mostly collectively. Discuss this sort of contractual decisions during the tender".*

After consultation, two main measures can be used to further address this theme. Firstly, a fair risk division can be acquired collectively throughout the procedure. Overall, it is underscored the contractor likes to know what risks the client is responsible for. Transparency about risk allocation and management should be enlarged, to create feeling of equality among the actors. A collective risk-allocation can be achieved by exchanging risk-files between the client and each contractor (in confidential dialogues). Based on the collective discussion of this files, the client determines the eventual risk division. It should be acknowledged that this risk division should be equal for all participating contractors. Additionally, complex issues concerning the conditions of the risk allocation and risk management should be discussed during the tender procedure. Dialogues can facilitate mutual assistance in risk-management as well.

It should be emphasized that discussion about risk files and risk management requires trust. Therefore, this measure is recommended to be used after investment in relationship building. Furthermore, a limited amount of contractors is required as these measures create an intensive process.

Secondly, award on lowest price should be used to create room to award on qualitative or relational criteria instead, named with the other themes. This measure can either be achieved by putting a small weight on the financial-criteria or small elasticity in the accepted price range. Secondly, the price can be banned out of the tender and be determined after award. Furthermore, possible reward systems, that can positively affect the contractor's motivation, can be formulated during the tender procedure.

To conclude, it is underscored that a critical look should be made into the initial contract specifications in reference to the discussion that were held, and relational topics that were determined in the tender. It is emphasized that when the contract does not fit the desired relation after award, a redefinition of contract parts is recommended to avoid conflict.

Reflection on the design starting point and -restrictions

The relation between the contractual agreements and the relationship figuration is well supported by literature. However, literature does not emphasize the necessity to further discuss and redefine these topics in the procurement procedure. Especially, collective risk division or refinement of the contract choice has not been performed frequently, though incentives like risk sharing are appearing (HHNK, 2014). The difficulty concerning these measures is the probability to create essential change within the contract specifications. However, a good preparation; defining open requirements and clear processes for contractual change, can decrease this liability.

2. *Co-creation of the project*

Development of the project takes place before, during and after the tender procedure. The extent to which the development is derived collectively is decisive for the collaborative potential of the relationship between C&C. Participants underscore the need to actively involve the contractor in the definition of the project specifications, as it can increase the contractors' commitment and feeling of appreciation during and after the tender procedure. Co-creation of the project can be achieved by measures before, during or after the tender procedure. The measures can be used in one phase in particular or in a sequence, developing a continuous co-creative process throughout the whole procedure. It should be emphasized that most measures are quite intensive. It is recommended to invest in this theme in projects with complex challenges, in which this investment can have a great effect on the quality of the project as well. Each step is illustrated in figure 22.

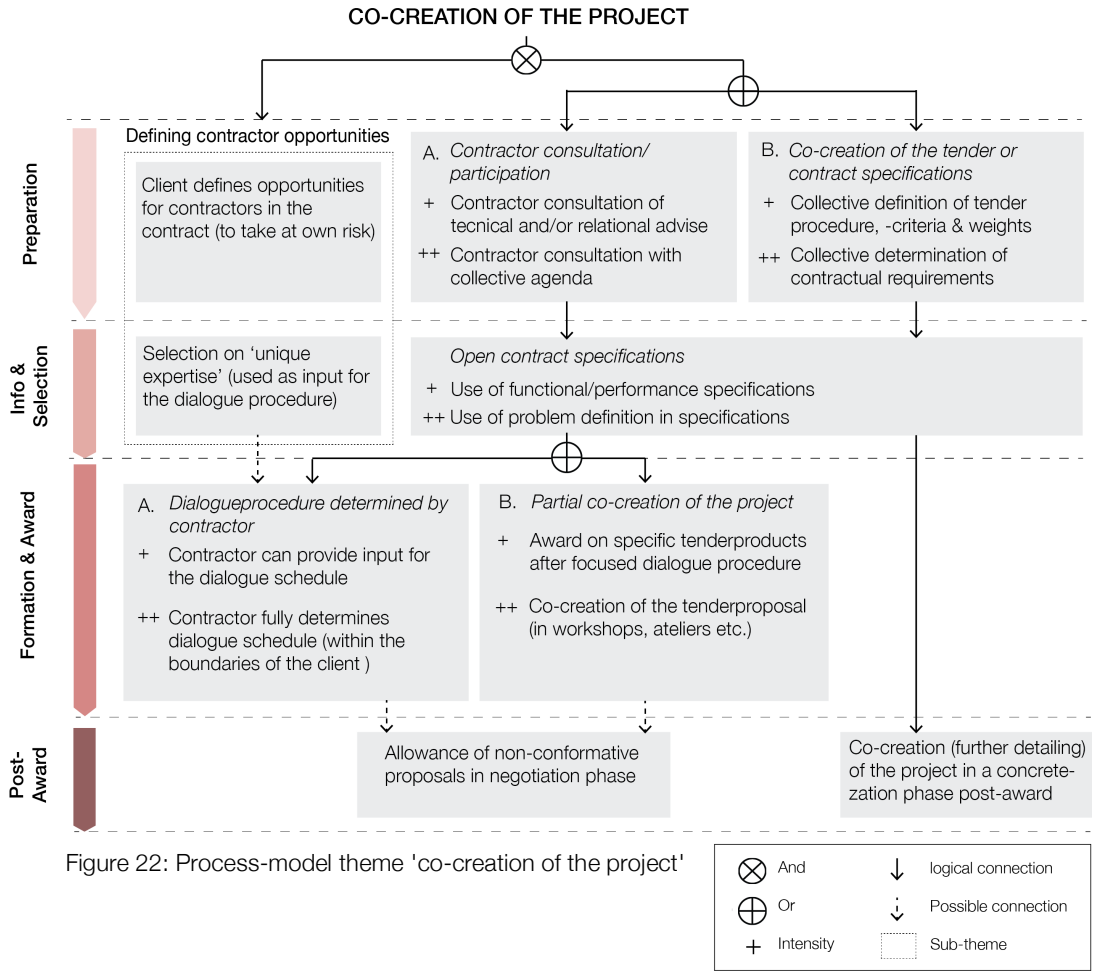

Figure 22: Process-model theme 'co-creation of the project'

During the preparation phase, clients can either perform contractor consultation, in which advice is collected for the execution of the tendering procedure, or co-create the contact specifications. It should be taken into account that the contractors are not yet committed to the project before the tender. Therefore, consultation should really focus on the contractor interests as well. Preferably, the described measures result in the use of open tender specifications, granting freedom for further detailing.

> *"Put the problem definition on the market instead of the solution. For example, the problem concerning a dyke reinforcement is the fact that it does not meet the water safety regulations. The problem does not involve the fact that the dyke should be higher or strengthened with a certain material. Putting the problem on the market in functional- or performance specifications provides freedom for the contractor to come up with smart solutions".*

An increased focus on opportunities for the contractors (to take at own risk) can be used as an extra measure to increase the commitment to the co-creative tender procedure.

> *"The client should think about project specific opportunities that are interesting for the contractor as well. For example, in a hospital project, the contractor was offered to exploit the retail stores in the main hall at his own risk. This increased the contractor's commitment to the project and helped the client as well".*

During the tender formulation and award phase, two directions can be chosen. Either the client and contractor continue a co-creative process in a specific dialogue process or workshops. Otherwise, the dialogue procedure can be used as an information course for the contactors, contributing to the optimisation of their tender process. It is advised to not rush the dialogue process, to give the contractor the chance to get engaged with the project. It is recommended to perform the described dialogue procedures with a limited amount of participants (between two and five).

A freestanding measure is to co-create the tender collectively after award based on other (relational) criteria. This is the most efficient way to perform co-creation. Co-creation of the tender after initial award can create a connection with the use of awarding on relational fit and -competences or postponement of price formation, named in the other themes. This form of tendering requires trust in the capabilities of the contractor.

Reflection on the design starting point and -restrictions

The theme co-creation has already gained focus in literature and present procurement procedures, as the blend of collaboration and substantive work fits well into the culture within the construction sector. Co-creation reflects directly on contracts that provide more responsibility for the contractors, like integrated and life-cycle contracts, and should not be used in more traditional forms of contracting. Furthermore, the measures relate to the use of the Competitive Dialogue Procedure. Mostly the measures within the preparation phase can create more value when the procurement procedure is interwoven with planning phase. Co-creation of the tender after awarding can be seen in the Competitive Procedure with Negotiation, only in a limited intensity. More intense concretization phases are used in Best Value Procurement.

Some clear feasibility issues appear concerning procurement law and transaction cost. The guarantee of information symmetry is complex when co-creation is utilized during the tender. While it is possible it requires time and costs, while co-creative processes already require a high amount of these two facets in the first place. Use of the co-creative measures before or after the tender solve this problem, but respectively create commitment and trust issues. Furthermore, the avoidance of essential change should be taken in consideration as well during a co-creative process. Based on the intensity of this processes, co-creation should be directed to interesting opportunities or complex situations that require the extra time and effort.

In fully innovative projects that require a high extend of co-creation, the Innovative Partnership Procedure can be utilized. This procedure facilitates co-creation by using temporary contracts for a development phase. Further improvement within procurement law should be found to contribute to this procedure (see chapter 5.2.3).

3. Definition of the partnership

The theme ‘definition of the partnership’ is directed to give substance to, and award on, the design of a partnership, as it is essential that both client and contractor have the same ideas about how the future relationship should be shaped. Furthermore, a lack of definition can result in misaligned expectations or even oblivion to desired relation. During the tendering procedure two different directions can be taken to accomplish this aspect; by defining a substantive partnering objective or by shaping the form and attributes of the partnership. Both aspects can be addressed in the tender formation and award phase, though it might be preferable to choose only one to address extensively in the tender procedure. Covering this theme is perceived to be helpful in any form of project. However, the level of intensity in which the measures are executed and weighted in the award criteria should be related to the intensity of future relationship, dependent on the complexity and duration of the project. Following, all applicable measures are illustrated in figure 23.

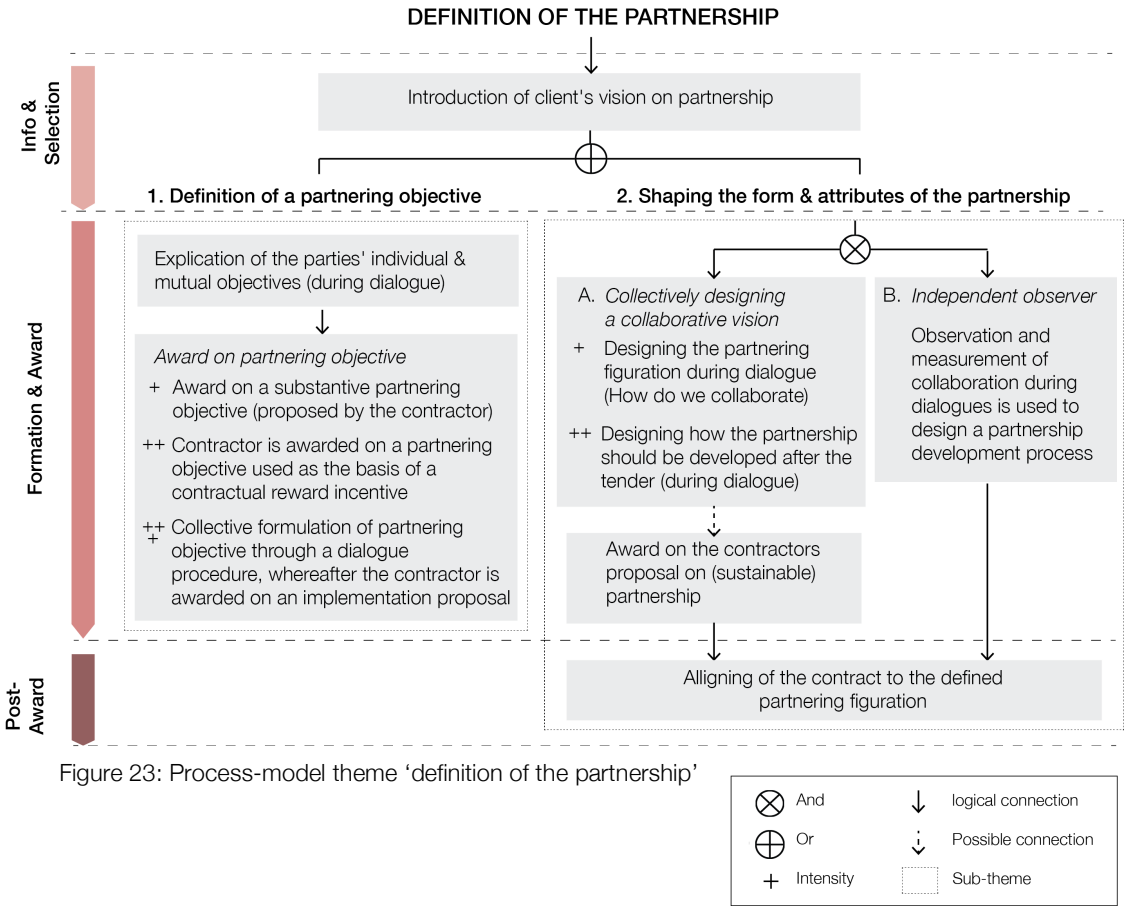

Figure 23: Process-model theme ‘definition of the partnership’

It is underscored that definition of a partnership should start by the client making an inspiring introduction of his partnership vision. The definition of a substantive partnering objective should be found within the common interests between both parties. It can be chosen to let the contractor propose this goal(s). However, collective discussion between C&C during dialogues is essential to create a goal that fits the interest of both parties. Furthermore, it is perceived to be valuable when this objective addresses a unique aspect within the project (stakeholder satisfaction, sustainability, innovation etc.) or even beyond the project (education, publicity, pilot etc.). The contractor’s commitment to goal can be enlarged by translating the objective to contractual incentives, shown in the different intensities provided within the measure.

> *A specific goal with a project can also serve to the collective definition of why are we doing this project. When changes or conflict arises it’s valuable to recall each other on this promise.*

Shaping of the form and attributes of the partnership can be achieved by two different measures. The first is directed to the use of dialogues, intended to formulate a concrete partnership vision of how the client and contractor should collaborate. This (sustainable) partnership vision can be used in the award criteria as well. The second measure implies the use of an independent monitor to observe the contact moments between both parties. Both actions, complementary or independently, can be used to create a plan for future development of the relationship between C&C. It is underscored that a partnership requires a development period directly after the tender to accomplish the desired relationship, especially within projects with intensive forms of partnership and a long duration.

Reflection on the design starting point and -restrictions

Both options closely relate to the use of the Competitive Dialogue Procedure as collective determination is essential for collaboration to work. The execution of these measures is relatively easy, but requires a convincing effort to have the desired effect. Small acknowledgement of this theme is prone to result in standard proposals and overlooking the required development time. To fully commit to this theme, participants have formulated it is effective to align the contractual agreements, like system-orientated contract management (NL: systeemgerichte contractbeheersing) or communication system, to the definition of the partnering figuration, as misalignment can cause conflict to arise.

4. *Team-composition based on relational fit & -competence*

Composition of the project-team (individually and collectively) based on relational fit or -competences is perceived as the most overlooked theme within the tender practises in the construction sector. It is emphasized that a more long-term orientation towards this composition is necessary. This requires award on the contractor-team based on relational fit and -competences next to the usual hard-competences. Furthermore, reflection, training, and adaptation of the teams based on relational skills and -fit can create a great contribution to the functioning of the future team. This measures should be addressed in de individual teams, but mostly after the tender procedure, in the collective project-team. The value of these measures are increasingly important in projects with an intensive form of collaboration or a long duration. All applicable measures are shown in figure 24.

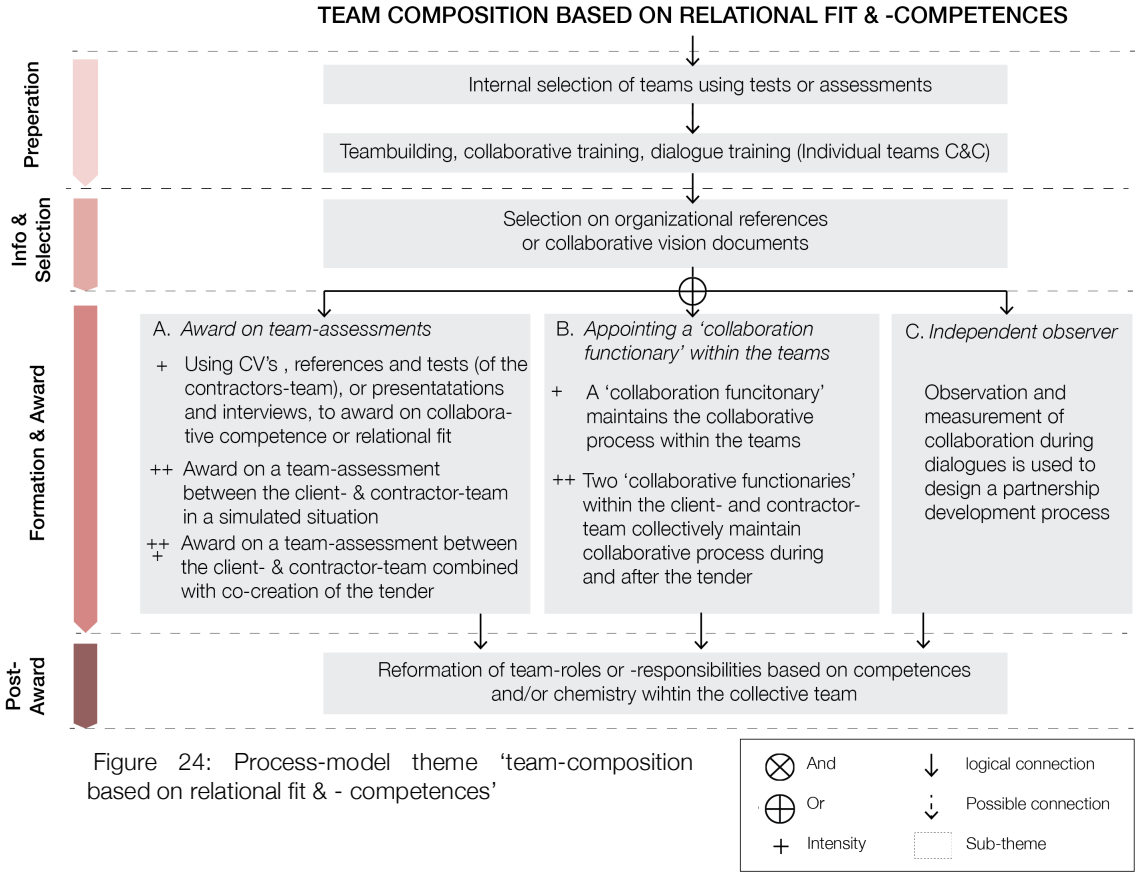

Figure 24: Process-model theme 'team-composition based on relational fit & - competences'

To start, it is acknowledged that the internal selection and preparation within the client- and contractor-teams requires more attention, especially within large consortia. Furthermore, the organizations can be selected based on references or collaborative vision documents.

During the formulation & award phase, three measures are described to assess, observe or monitor collaborative competences and –fit, which can either be used as award-criteria or to create insight in improvement points. Firstly, team-assessments can be used to award the team which shows the highest potential to create a collaborative relationship with, based on commence and chemistry. This assessment should be performed in a collective setting and can be combined with work-shops, involving real interests. This form of assessment creates the most authentic behaviour. The use of assessment as award criteria should always be combined with award on qualitative- and financial-criteria as well, possibly in different rounds of a knock-out system. The intensity of this measure requires a limited amount of participants.

> *"Team-assessments were recently used as a 100% knock-out criteria within the tender of a pilot project for the 'Marktvisie'; project DOEN. In this tender, five parties were selected based on a short vision document on collaboration. Thereafter, five team-assessments led to the knock-out of two of the five contractors. The final award was based on a substantive tender proposal from the remaining contractors".*

The other two measures illustrated in figure 24, are directed to put effort in the creation of competences and chemistry between the parties. The use of a 'collaboration functionary' within each team can be used to observe, and reflect on collaboration, ultimately to help a team improve. This reflection can be exchanged among the client- and contractor-team as well. An independent monitor can contribute to the same goal.

After award, the input from the assessments, 'collaboration functionaries' or independent monitors can be used to shape the collective team-roles and -responsibilities based on collaborative skills and chemistry. To really improve the functioning of the team both client and contractor should be willing to make changes concerning their normal habits and culture.

Reflection on the design starting point and -restrictions

Such an extensive emphasis on team-assessment, observation or monitoring is quite new within the procurement practises of the construction sector, therefore this topic is not addressed in literature yet. However, the absence of this theme was described by literature as a clear barrier for collaboration between C&C. The feasibility of this theme is dubious because it is outside the comfort zone of the construction sector. Additionally, the measures can only be effective when a high level continuity is guaranteed within the team and when the individual teams are willing to change for the benefit of the collective team. Lastly, it should be emphasized that collaborative competences or chemistry should be balanced against other qualitative award criteria and financial criteria. A founded choice between a combination of this criteria is required.

> *"We can learn a lot from procurement practices in the private sector, where award on CV's, references and chemistry is quite normal. There is however a big difference between projects covering a price €50.000 or €50.000.000. This form of award requires guts when used in projects with much higher stakes".*

It should be emphasized that organizational experience and visions are part of the selection-criteria. The award-criteria must be directed to the tender proposal. The award criteria can measure relational aspects that relate to the quality of the proposal as well. Furthermore, measurement of competences and relational fit has to be objectified completely within the selection- or award motivation. Use of independent panels, validated tests and clear criteria is required.

7. Conclusion

In the conclusion, the research question is answered, by means of the overall findings of the research and the essential principles for the construction of a collaborative procurement procedure.

7.1. Practises that have to be prevented

Procurement practises within the public sector of the construction industry, performed under the European Procurement Directive, frequently cause barriers to develop a collaborative relationship after procurement. During procurement, the most persistent mistakes that are made concern the definition and acceptation of unreasonable conditions like transfer of unmanageable risks or unreasonable expectations concerning the quality that is delivered for a certain price. These conditions lead to contractual agreements that attract mayor conflicts, as strategic behaviour will be triggered. Another mistake that is made, is the fact when a situation like this occurs, both parties neglect to reveal this matter and talk about it. Apart from these practises, the technical and conventional culture creates challenges as well, as the actors within the sector are not used and skilled to procure with a focus on collaboration.

Ultimately, in current procurement practises, the client and contractor are stuck in a culture in which the use of strategic behaviour, like unreasonable pricing or withholding of relevant information is no exception. This behaviour leads to a feeling of mistrust, triggering more dishonest behaviour. These practises have started a vicious circle. Additionally, this culture continues to facilitate formal and risk-adversarial behaviour during the tender procedure and a persistent use of traditional forms of procurement, which do not facilitate collaboration.

As collaboration proves to enhance project results, it is investigated how this practises can be changed and how the potential of collaboration between C&C can be enlarged during the procurement procedure. The answer to the research question is provided;

How can the potential of a collaborative relation between client and contractor be increased throughout the procurement procedure of a construction process?

7.2. Answer to the research question

This research has identified multiple measures that can be utilized to enhance collaboration throughout the procurement procedure. Overall it is concluded that this enhancement entails two main requirements.

First, the chance of future conflicts developing between C&C should be limited, as these conflicts directly ruin the potential of collaboration. In the current practises, these conflicts mostly derive from strategic behaviour caused by the definition and acceptation of unreasonable conditions like transfer of unmanageable risks or unreasonable expectations concerning the quality that is delivered for a certain price.

It should be emphasized that contract conditions, like risk allocation, price range and contract specifications, are set by the client before the procurement procedure starts. This research gives insight in the fact that a collaborative procurement procedure should use the opportunity to talk about these conditions more frequently. A real change can be made when these conditions are not seen as a fixed fact, but a topic that is collectively and transparently discussed and defined within the procedure. This opportunity can improve the level of trust between C&C and demotivate strategic behaviour.

Secondly, the procurement procedure should facilitate a process that actively addresses elements that are necessary for a collaborative relationship, which is beyond the technocratic and conservative culture within the construction sector. To actively enhance the potential of collaboration, the client

should pursue the opportunity to involve the contractors in the development of the project throughout the tender. Furthermore, the procurement procedure facilitates the opportunity for the client to connect with the contractors, which in a collaboration-focussed procedure, should be used to talk about relational topics that define the future partnership. Complementary, the selection- and award criteria should be used to evaluate the contractors based on relational proposals, collaborative competences or chemistry.

Overall, it is concluded that the opportunities to enhance collaboration throughout the procurement procedure are there. However, the extent to which investment in this opportunities is actually made is limited, as the profit gained by this investment is always uncertain. While the post-procurement phase offers a more convenient way to enhance collaboration, current practises show that by then, it is already too late. Therefore, the most essential aspect to enable change in the current practises is the recognition of the necessity to invest in collaboration throughout the procurement procedure. A convincing attitude is required when constructing and executing a collaborative procurement procedure, as an apparent contrast should be made with the current practises and existing culture.

7.2.1. Construction of a collaborative procurement procedure

This research has identified concrete measures that can contribute to a collaborative procurement procedure, provided in the design in chapter 6. The construction of a collaborative procurement procedure is recommended through the following principles;

- **A collaborative procurement procedure starts by investing in the motivation of trust and demotivation of strategic behaviour;**

Distrust and strategic behaviour are mostly caused by unreasonable compensation, transfer of unmanageable risk or withholding of relevant information. In a collaborative procurement procedure, it is therefore relevant to set a fair price range and provide a reasonable compensation for the tender. Furthermore, the impossibilities and imperfections within the contract should be actively discussed during the tender to prevent these errors from triggering claiming behaviour. During a dialogue procedure, assistance in risk management and collective discussion about the risk allocation can be used to derive a fair and transparent risk division. Additionally, the motivation to win on lowest price should be minimalized during the tender, to demotivate contractors to use opportunistic prices to win the tender.

- **The construction of a collaborative procurement procedure requires a fundament to enable the procedure to work, and more facilitative measures to directly enlarge the potential of collaboration;**

A solid fundament should be built by investing in relationship building and the creation of an informal atmosphere. Furthermore, a convincing procedure, requires honest and reasonable behaviour from the client and motivation of this behaviour from the contractor. Lastly, when the procedure selects or awards on relational proposals or assessments, the applicable criteria require considerable weights to have a sufficient effect.

To really launch a collaborative relation, more facilitative measures should be added to the construction of the procedure. Different directions can be chosen. Collective discussion about risk management, bonus-systems and the sources of costs, can increase the level of trust and transparency between the teams and can lead to a collective alignment of the contract & desired relationship. Involvement of the contractors throughout the step-wise specifications of the project can add to the contractor's commitment. Moreover, co-creation of the project can directly facilitate the process of collaboration. Award on a partnering vision or project-related partnering goal can provide meaning to the collaboration, which can improve the value and functioning of the partnership. Lastly, team-assessments or observations on relational fit & -competences can contribute to the award of the most compatible and competent partner. These measures can also contribute to the formation and training of a well-working team.

- **Collaborative procurement can be performed by a wide range of options. For an effective and feasible procedure, founded selection is required;**

The use of collaborative procurement measures should fit the situation, type of project and wishes of the client. As not all relational topics can be addressed within one procedure, it is essential to make choices based on the existing culture, the project characteristics, the preferred intensity. In this selection, a balance should be found between the initial investment in the procurement procedure and the profit gained from a collaborative relationship throughout the construction process. This does not only imply the compensation of transaction cost within the procurement procedure. It also refers to the balance that should be found between the relational, qualitative & financial criteria within the tender selection and -award.

- **The construction of a collaborative procurement procedure should be embedded in the existing procedures following the regulations of the European Procurement Directive;**

This creates certain liabilities for the comprehensiveness of the procedure. It should be emphasized that different relational-, financial- and technical criteria can be used next to each other within the MEAT-system. However, collaborative procurement might benefit from using more award steps, using a knock-out system. This facilitates the possibility to decrease the amount of participants as well, which is relevant for measures that require high investment. Furthermore, the described relational measures can create liabilities concerning the guarantee of a level playing-field, an objective evaluation, and exclusion of essential changes. However, a good preparation can make a collaborative procurement procedure possible.

- **A daring, congruent and future-focussed behaviour is vital to make a collaborative procurement procedure work;**

A collaborative procurement procedure, creates a contrast with the hard and technocratic culture and can never guarantee the future benefits. Therefore, the construction and execution of the procedure requires a daring attitude in which the client should be willing to invest in these uncertain benefits, and let go of the persisting culture and reserved behaviour towards procurement law. This starts by constructing a congruent, on collaboration focused procedure, in which openness and recognition of the other party is central.

8. Discussion & Recommendations

In this chapter, the limitations of the research are discussed concerning the research methodology and chosen scope definition. Thereafter, a reflection is shared if the research results contribute to the defined goal.

8.1. Limitations of the research

As the research is conducted in a time frame of six months, the methodology and chosen research scope create limitations to the research results. Both limitations are discussed.

Limitations of the methodology

This research has an explorative character. Consequently, the research was mainly focused on deriving the design input for a collaborative procurement procedure formulated by four focus groups. Furthermore, a validation of this input was performed using an expert panel. Both methods hold certain limitations, that should be taken into account when reading the research.

The focus groups

- The focus groups were composed of a total of fourteen procurement experts with different backgrounds. The results of these focus groups are therefore limited by the extend of the creativity of these participants. However, the participants were specifically selected based on their 'open view' towards procurement.
- The focus groups were directed towards predefined barriers. Therefore, effective measures can be overlooked. Though, it is perceived that the participants have formulated more general directed measures by themselves, as they were aware of the goal of the research.

The expert panel

- The expert panel consisted out of a limited amount of six experts (operative at Twynstra Gudde). Consequently, the validation of the results is not fully representative.
- It is not validated if the results of the focus groups would be used by the developers of a collaborative procurement procedure, the public clients within the construction sector. However, all experts within the panel are either working for- or involved in these parties' projects.
- The expert panel had a limited focus. Consequently, only the potential of the full themes was validated. This was not done for each measure separately. Additionally, the relations between the barriers, themes and measures are not validated.

These limitations lower the validity and reliability of the research. However, the relations and potential of the design themes are not only derived from the focus groups and expert panel. A reflection on existing literature was used to interpret these factors as well.

Limitations of the research scope

Based on the research scope, the following limitations should be taken into account;

- The research is focused on procurement exceeding the European threshold, within the public construction sector. While parts of the design themes and measures can be applied in other sectors or different tender procedures, it should be taken into account that the overall conclusion is focused on the specific culture and procurement practises within the construction sector. This creates certain implications which might not fit into a different sector or practise. Additionally, non-competitive procurement allows for more efficient ways to achieve the same goal.
- The research is directed towards the design of a procurement procedure based on process measures. Other contributing topics, like the preconditions of a procurement procedure (contract form, risk allocation & contract remuneration), or required behaviour and skills, are addressed but are not specifically researched. Furthermore, the research has not specifically investigated in the cost- and time efficiency of the recommended themes and measures. It should be taken into account that these factors do contribute to a collaborative procurement procedure.
- The research is written from the perspective of the client, as the procurement procedure is designed by this party. Therefore, this research mainly addresses how the client's process can

lead to an enlarged potential of collaboration, often relating to the motivation of the contractors as well. However, the research does not address how the contractors should design their process or define their tender submission to enhance the potential of collaboration and motivate the client.

8.2. Interpretation of the results

The answer to the research question is provided. Though there are some relevant discussion points concerning the achievement of the goal of the research. A reflection on these points is provided.

8.2.1. Reflection on the research objective

Many ideas, old and new, concrete and abstract, more or less intensive, have been formulated and validated to enhance the potential collaboration throughout the procurement procedure. Therefore, the result is perceived to be able to achieve the desired goal; *increase the potential of a collaborative relation between C&C in a construction process.* However, some discussion points must be noted;

Relativity of the possibilities within the procurement procedure

While this research has identified many opportunities that can be used within a procurement procedure to enhance the potential of collaboration, this procedure is still a competitive procedure that has to be executed with multiple participants within a regulated environment. This implication makes it very challenging to really work towards a collaboration. As the basic principles of procurement law cannot be changed, the improvement of collaboration throughout the procurement procedure can only go so far. The key value of investing in a collaborative procedure is thereby not only to launch a collaborative relationship, but mostly to limit the chance of a ruined potential for this relationship in the first place.

However, the trends that are occurring in procurement law, the obligation of MEAT and motivation of the use of dialogue-, negotiation- and innovative procedures should be seen as an opportunity that can create great value to a collaboration-focussed procurement procedure. These opportunities should be utilized instead of focussing on everything that cannot be achieved. It is interesting how the development of procurement law can contribute to further motivate collaborative forms of procurement. Further elaboration on the collective development of a project, and the implications to essential change are herein crucial.

Critical Success Factors of collaboration that cannot be facilitated in a procurement procedure

Looking at the factors that are necessary to collaborate, the design of a collaborative procurement procedure can only address part of the Critical Success Factors for a successful collaboration, see figure 25.

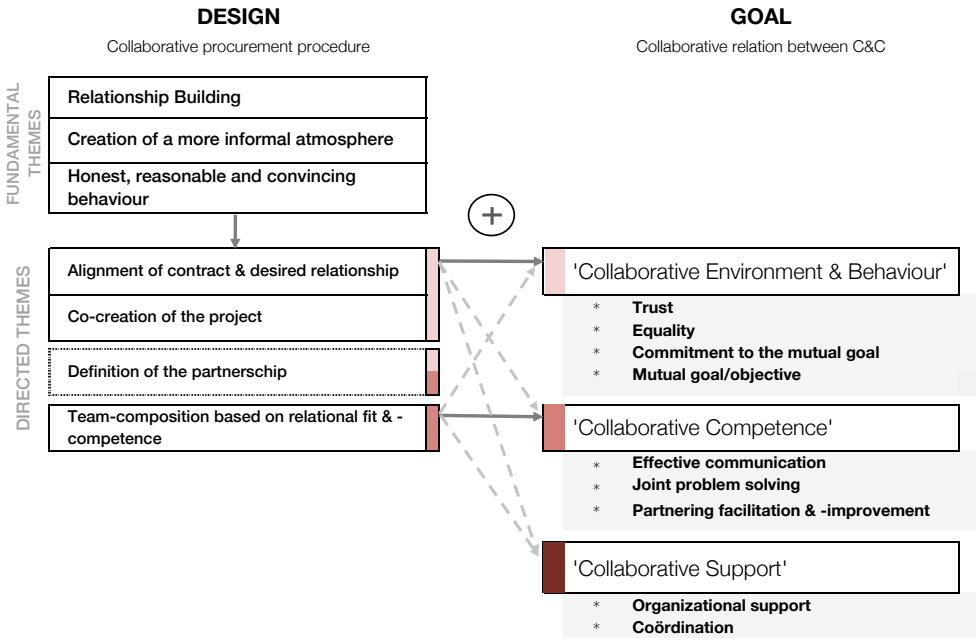

Figure 25: Influence of collaborative procurement on collaboration

A collaborative procurement procedure can enhance the facilitation of a collaborative environment, enhancing trust, mutual objectives and a feeling of equality. The procurement procedure can also focus on selection and training of collaborative skills within the future team. However, a successful collaboration also requires coordination and support, throughout the entire process, which cannot fully be achieved throughout a procurement procedure.

To increase the chance of a successful collaboration it should be taken into account that the improvement of collaboration in the procurement procedures can only go so far. A collaborative relation requires maintenance during the entire process. Additionally, a collaboration within a construction project does not stop at the C&C. Engaging the other involved parties can increase the chance of an overall collaborative environment. However, it is perceived that changing the relation between C&C is a good starting point, as they are the most present parties within the project. Thereafter, changing the relationships with the other parties will be easier.

Additionally, a collaboration is not only influenced by the behaviour and decisions of the contractor- and client-team, but needs support from the mother organizations and politics. This support, has a great influence of the feasibility of collaborative procurement procedures as well. The losses that are made during the building crisis make this support very fragile. If these parties keep on pressuring on economic drivers, a shift towards procurement focused on the enlargement of collaboration will be very challenging. Fortunately, incentives like the 'Marktvisie' are appearing, contributing to the realization of the necessity to change the ongoing practises in the building sector.

Contribution to the desired change described in the 'Marktvisie'
This research relates very strongly to one of the leading principles of the 'Marktvisie'; Tendering. This principle describes that "the fundament of a well working collaboration and a successful project should be built in the tender. Factors that obstruct this process, should be discussed, understood and solved during the procedure" (Rijkswaterstaat, 2016b, p. 4). For now, the 'Marktvisie' mainly forms a vision document. This vision is translated to a try-out phase, using pilot projects and events, to practise, learn and improve new ideas. Thereafter, it is aimed the vision will be translated into actions by individual firms. The design that is provided in this research can contribute to the try-out phase and concretization of the leading principle 'Tendering' as it offers very concrete tools to facilitate the described statement. The research can therefore be used for education and piloting of more collaboration-focussed procurement procedures. Actual execution and reflection can facilitate the refinement of this form of procedure. Additionally, this research relates to the other four principles as well (described in chapter 1.3). This underscores how essential the change of the procurement practises is in the facilitation of collaborative relationships and overall improvement of the sector.

8.2.2. Reflection on the higher objective

When an enlarged potential of collaboration can be achieved throughout a collaborative procurement procedure, this does not guarantee the higher objective of this research; Successful project results.

Optimal balance between investment & profits
The chance of a collaboration procurement procedure leading to successful project results can be increased by finding an optimal balance between the investment in collaboration during the procurement procedure and the benefit gained from a collaborative relation between C&C throughout the construction process. It is logical to assume more benefit would be gained in project characterized by high customization, -duration, -time pressure, -uncertainty and -complexity which is validated by Eriksson (2008). However, as each project is unique, and each party is unique, it is still very complex to forecast how much investment is right in which situation. Next to the amount of investment an effective direction of investment should be taken in consideration in a specific project. For example, investment in co-creation is mostly recommended to projects that require innovative solutions. The last consideration that is essential, is how the use of relational criteria in the MEAT-system should be balanced against the use of financial- and qualitative criteria. While a successful project requires collaboration, it also requires technical skills and a fitting budget.

8.3. Recommendations for further research

Based on the limitations of the research and reflection on the research results, the following recommendations are provided for further research.

- The exact relations between different themes, measures and barriers is not studied or validated in this research, but essential to refine the recommendation of collaborative procurement. Furthermore, a representative validation of the effectivity, feasibility and preference can contribute to this recommendation as well. Further investigation on these topics would therefore contribute to this research.
- As the procurement procedure involves two perspectives, it would be relevant to perform a similar form of research focussed on the procurement process of the contractor. In this research it would be valuable to address how both the process and tender submission can contribute to the enlargement of the potential of a collaborative relationship between C&C.
- In relation to collaborative procurement it is relevant to research how the development of the European Directive can further contribute to the facilitation of collaboration-focussed procurement procedures. Within this topic it is relevant to look into regulations concerning the selection- and award criteria, the use of knock-out systems, the facilitation of co-creation and the necessary preparation and processes to discuss and redefine contractual conditions.
- Finally, it would be valuable to do further research into the considerations that should be made concerning the amount and direction of the investment that is made in collaborative procurement in relation to the type of project. This insight can contribute to a sharper recommendation to how a collaborative procurement procedure should be constructed for a certain type of project.

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APPENDIX A
LITERATURE STUDY

Appendix A.1 – Concept of collaborative procurement

The following table shows a comparison of various researches that describe the concept of collaborative procurement and the factors that relate to this concept.

Core elements of the procurement procedure	Concept of collaborative procurement	(Rahman & Kumaraswamy, 2008)	(Plane & Green, 2012)	(Eriksson, 2010) & (Eriksson, 2008)	(Erikson & Atkin, 2009)	(Koorneef, 2014)	(Kadefors, Bjorlingson & Karlsson, 2007)	(Leenderstsen, Lenferik & Arts, 2012)	(Santema, Van de Rijt, & Witteveen, 2011).
Procurement procedure	Limited invitation to the tender			X	X	X			
	Dialogue procedures during procurement		X				X	X	
	Tailored procurement procedures				X			X	
Contract specification	Joint specification of contract			X	X				
	Best Value Procurement								X
Consultation of contractors	Use of contractor consulation or scans before the tenderphase					X		X	
	Seeking specific inputs on project specifications during tender	X							
	Interweving planning and procurement							X	
	Early Design Contests & Marktet Reconnaissance							X	
Tender selection	Limited invitation to the tender			X	X	X			
	Evaluating references of previous clients	X					X		
Tender awarding	Soft parameters in award criteria	X		X	X				
	Focuss on chemistry/ cultural fit	X	X			X			
	Evaluating the CV of participating individuals	X			X		X		
	Focuss on partnering characteristics in award criteria		X	X					
Further partnering implementation	Describing the partnering model						X		
	Describing attributes to a collaborative realtionship in the notifications		X		X	X			
	Evaluating contractors perceptions of collaboration in the tender						X		
	Training to work in flexible contracts/team by client & contractor (before entering into the contract)	X							
	Usage of collaborative tools such as start-up workshops, formulation of joint objectives, follow-up workshops, teambuilding, conflict resolution techniques			X	X				
	(Relational) procurememt training by client	X	X		X				
	Incemental learning & procurement evaluation			X					
	Bringing major sub-contractors & suppliers into the projectteam in early stages (broad partnering)	X			X				
	Collaborative selection of sub-contracotrs (based on cultural fit)		X						
Related aspects									
Contract choice	Integral- or lifetime contracts			X	X				
Risk allocation	Equal risk allocation	X							
	Risk sharing	X							
Contract remuneration	Compensation using reward incentives			X	X				

Appendix A.2 – Scope of collaboration

The following table illustrates a comparison of various researches describing the scope of collaboration within the construction sector (defined in Critical Success Factors).

		(Cicmil & Marchall, 2006)	(Kadefors, 2004)	(Zandstra, 2011)	(Cheng & Li, 2002)	(Chan, et al., 2004)	(Moonen, 2016)	(Ivanova, 2016)	(Koorneef, 2014)
Collaborative Environment & Behaviour									
Trust	Mutual Trust				X		X	X	X
	Granting freedom within contract	X	X			X			
Equality	Feeling of equality						X		X
	Equal level of commitment between parties					X			
	Equal sharing of risk/rewards between parties					X			
	Respect for the opposite party (and their expertise)								X
Mutual goal/objective	Creating mutual objectives			X			X		X
	Transparency about individual interest								X
	Defining a partnering strategy				X	X	X		
	Using an integral approach							X	
Commitment to the mutual goal	Commitment to win-win situations					X			X
	Empathy for the other parties' goals		X			X		X	X
	Wish to comply to the expectations of the other party							X	X
	Taking responsibility								X
	Willingness to invest in collaboration								X
	Long term-commitment								X
Collaborative Competence									
Effective Communication	Open communication	X			X			X	X
	Clear formulation of responsibilities					X			
	Fitting processes/ procedures for communication	X					X		X
Joint Problem Solving	Joint problem solving techniques/skills	X			X		X	X	X
	Definition how to deal with change		X			X			
Partnering facility & improvement	Adequate competences and resources for collaboration				X			X	X
	Experience with partnering				X	X	X	X	
	Facilitating measures for collaboration				X				
	Improvement measures for collaboration				X				X
	Fit of organizational cultures							X	
	Fit of personalities (diversity)							X	X
	Understanding the other parties' 'way of working'								X
	Strong team cohesion/team environment								X
Collaborative Support									
Organizational support	Organizational (top management) support				X	X	X		
Coordination	Effective coordination/monitoring of partnering				X	X			
	Fitting processes for coordination						X		

Appendix A.3 – Barriers for collaboration occurring in the procurement phase

The following table provides the results of a comparison between researches describing the barriers for collaboration, occurring during the procurement phase.

Main Barriers

		(Rahman and Kumaraswamy, 2008)	(Plane and Green, 2012)	(Eriksson,2010) & (Eriksson, 2008)	(Walker, Schotanus, Bakker, and Harland, 2013)	(Eriksson and Atkin, 2009)
Persistance of own objectives (based on economical drivers)	Commercial pressure on contractors/oppertunistic behaviour	X				
	Emphasis of economical drivers instead of relational drivers by the client (price-only selection methods)*	X	X	X		X
	Aggressive negotiation		X			
	Emhasizing competition by the client (open procedure)			X		
	Lack of trust towards public clients	X				
	Non-open and -honest communication	X				
	Resistence/unwillingness to change	X			X	X
Lack of commitment and mutual specification	Strict contractual clauses are enforced (inappropirate contract strategy)	X	X	X		X
	Project specification is only performed by the client			X	X	X
	Absence of scope for innovation	X				
	Lack of attention to contractor resistance				X	
	Lack of consideration of contractor				X	
	Lack of team working attitude	X	X			X
	Lack of initiative/commitment client	X			X	
	Lack of commitment contractors	X	X		X	
Feeling of inequality	Uneven commitment	X				
	Unequal diversion of risk and rewards	X	X		X	
	Unrealistic expectations (from one party)				X	
	Persistence of hierarchy between C&C	X			X	
Unclear definition of partnering objective	No agreed goals/performance measures				X	
	Misalignment and/or unclearity about the defintion of collaboration		X			
	Exclusion of major sub-contractors in the tenderphase	X				
No (selection on) 'relational fit'	Cultural clash on team/individual level	X				
	Resistance to integrate cultures	X				
	Different 'way's of working' between parties				X	
	Use of E-tools instead of face-to-face interaction during procurement		X			

No (selection on) 'relational fit'	Cultural clash on team/individual level	X				
	Resistance to integrate cultures	X				
	Different 'way's of working' between parties				X	
	Use of E-tools instead of face-to-face interaction during procurement		X			
No (selection on) collaborative competence	Traditional procurement procedures (price-only)					X
	Focus on project instead of process					X
	Inappropropriate procurement strategy (hard-focus)	X				
	Emphasis of economical drivers instead of relational drivers by the client (price-only selection methods)*	X	X	X		X
Lack of expertise in perfoming collaborative procurement procedures	Communication leads to misunderstanding		X		X	
	Lack of (relational) procurement skills/resources	X	X		X	X
	Lack of use of collaborative learning techniques			X		
	Improper knowlegde or unclear definition by the client	X	X		X	
	Client is dependable on suppliers for required data				X	
	Lack of procurement credibility, los of status				X	
	Ambiguous/unclear contract clauses	X	X			
	Inapproapriate planning (of the tender)	X			X	
	Lack of standardized procedures				X	
Other (Lack of support)	Bureacratic client organization	X				
	Neglected interest of own organization	X			X	
	Geograpic distance				X	

Overlapping Barrier

Rules & Regulations	Stringent/incompatibel public sector rules and regulations	X	X			X
	Potential legal liabilities in resolving non-contractual issues	X				
	Inability to focus on a continued relation between C&C (due to public procurement law)		X			

APPENDIX B
FOCUS GROUPS

Appendix B.1 - Protocol Focus Groups

The design input is gathered by means of four focus groups composed of three to four procurement experts. The focus groups were characterized as brainstorm sessions.

Goal of the focus groups

The goal of the focus groups is to attain the answer to sub-question 2a; *Which measures can increase the potential for a collaborative relation between C&C?*

In order to fulfil this goal, the most important aspects to be considered are;

1. *The acquirement of the answer to the research (sub-)question;*
   This requires the formulation of a clear focus question and scope for the focus groups. Furthermore, simplicity and unambiguousness of these formulations are beneficial to this aspect.
2. *Creating added value to the existing answers described in literature;*
   As formulated in the research objective, this research aims to provide a more detailed answer to how a collaborative procurement procedure can be designed. Existing literature only provides conceptual ideas but lack insight to practical implementation. Therefore, the sessions should gather ideas with a more detailed abstraction level.
3. *The gathering of usable data to formulate a conclusion;*
   As the focus groups form a rather free form of data collection, extra focus should be set on the attainment of usable data. Too increase the validity and reliability of the answers, the acquired data should be clear and unambiguous. Furthermore, a comparative analysis between the session can increase the validity of the acquired answers. An identical and systematic approach of the sessions can contribute to this aspect.

Design of the focus groups

The focus groups are directed to the *formulation of process measures for a collaborative procurement procedure* by means of a brainstorm process. As explained in the research methodology, this goal is defined in a set of design requirements for a collaborative procurement procedure, concluding from the literature study.

Focus Question

During the sessions these design requirements are translated into a focus question; *Which measures can be formulated to (one of the defined design requirements)?* The exact scope of this question, as it is described in the research scope, will be explained during the session.

Figure 1 defines the input for the focus questions; the design requirements. The design requirements originate from the identified barriers for collaboration between C&C occurring in the procurement phase. The design requirements are formulated as the inverse of these barriers to simplify the focus question. An example of one of the seven focus questions is; *Which measures can be formulated to increase commitment and mutual specification?*

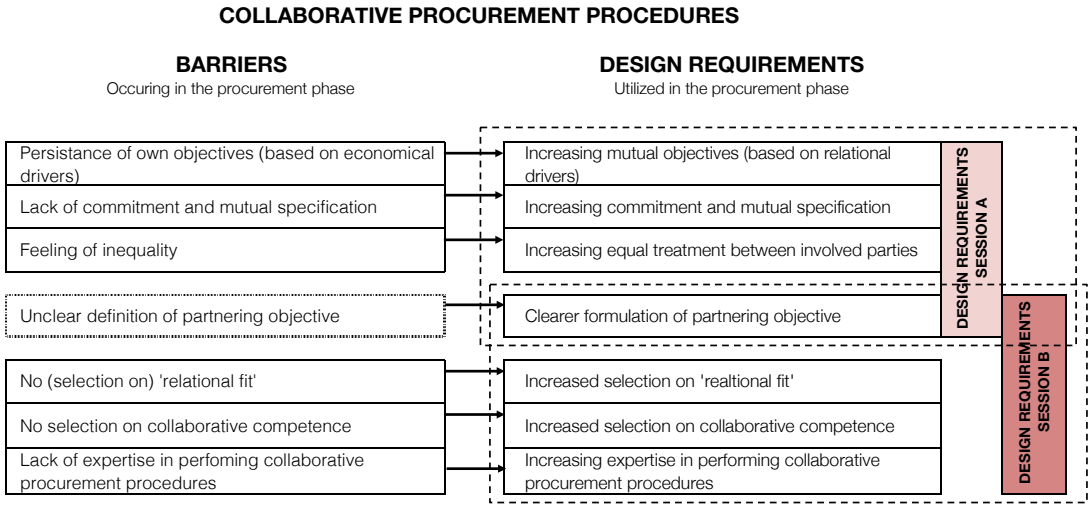


Figure 1: Design requirements focus groups

Session A & B

Because of the comprehensiveness of the topic, it is chosen to address the design requirements in two different sessions, each performed twice. The design requirements 'Increasing mutual objectives (based on relational drivers)', 'increasing commitment and mutual specification', 'increasing equal treatment between involved parties' and 'clearer formulation of partnering objective' are addressed in session A. These factors are interpreted to be related to the 'collaborative environment & behaviour' within the project team. The design requirements 'increased (selection on) relational fit', increased selection on collaborative competence, 'increasing expertise in performing a collaborative procurement procedure' and 'clearer formulation of partnering objective' are addressed in session B. These factors are perceived to be related to the 'collaborative competence' within the future project team.

Presentation of the design requirements

Within the different sessions, the four design requirements will each be addressed separately. In the presentation of the focus question, the positive design requirement and applicable barrier will be explained. Furthermore, the barrier will be elaborated throughout citations from literature, shown in figure 2. Hereby participants will be provided with (1) the direct goal of the session and (2) the reason why this requirement should be met. When necessary, some examples are given to decrease the chance of participants formulating 'open doors'. The participants will be motivated to formulate ideas with a lower abstractions level, than the formulated design requirement.

Figure 2: Example sheet focus group

Overview of the sessions

The session consists of three parts, illustrated in table 1. Each part, and the sub-steps within this part, will be explained.

Part		Primary goal	time
1.	*Introduction*	- Becoming acquainted with each other and the research topic; - Motivating the participants.	10 min
2.	*Explanation*	- Explanation of the goal and scope of the brainstorm; - Explanation of the execution of the brainstorm;	10 min
3.	*Brainstorm* ***This step exists of;***	- Answering the research question (given the three most important aspects)	
	A. Brain-writing (individual brainstorm)	- Involving all participants - Gathering a broad scope of ideas	40 min
	B. Mind-mapping (collective brainstorm)	- Creating synergy between ideas	20 min
	C. Starbursting (collective brainstorm)	- Elaboration of the ideas	40 min

Table 1: Overview focus group sessions

Execution of the focus groups

Following, each part is explained, focussing on how the validity, generalizability and reliability can be guaranteed throughout the course of the focus groups.

Part 1: Introduction

As most of the participants know each other, just a brief introduction round is requested from the participants. Thereafter a PowerPoint presentation is used to introduce the session, which addresses the following topics;

1. Introduction of the researcher & introduction of the participants (when necessary an introduction round is used).
2. Explanation of the layout of the session.
3. A brief introduction of the research problem definition, research objective and research relevance and ultimately the goal of the session in particular.

These steps should accomplish a more unclenched setting and good understanding of the goal of the session. The research itself will not be explained elaborately to increase simplicity of the session. Though it is chosen to use the problem definition, research objective and research relevance to gain understanding, support and motivation from the participants.

Part 2: Explanation

The explanation of the session is illustrated in a PowerPoint presentation. The following elements are part of this presentation;

1. Explanation of the focus question;
2. Introduction of the design requirements;
3. Explanation of the scope of the session (session A or B);
4. Explanation of the scope in which the focus question should be answered;
5. Explanation of the execution of the brainstorm;

During the explanation, the presentation only addresses the core scope and goal of the session to decrease the chance of misunderstanding, thereby possibly increasing the validity of the method.

Part 3: Brainstorm

This part comprehends the goal of attaining valuable and concrete ideas to formulate a collaborative procurement procedure, ultimately to answer the sub-research question (the goal of the focus group).

To accomplish this goal, the session is directed in the following order; (1) attaining a wide scope of ideas, (2) creating synergy between the ideas, (3) getting an in detailed elaboration of the ideas. Three techniques are selected to acquire this effect, illustrated in figure 4. Following, each step is explained.

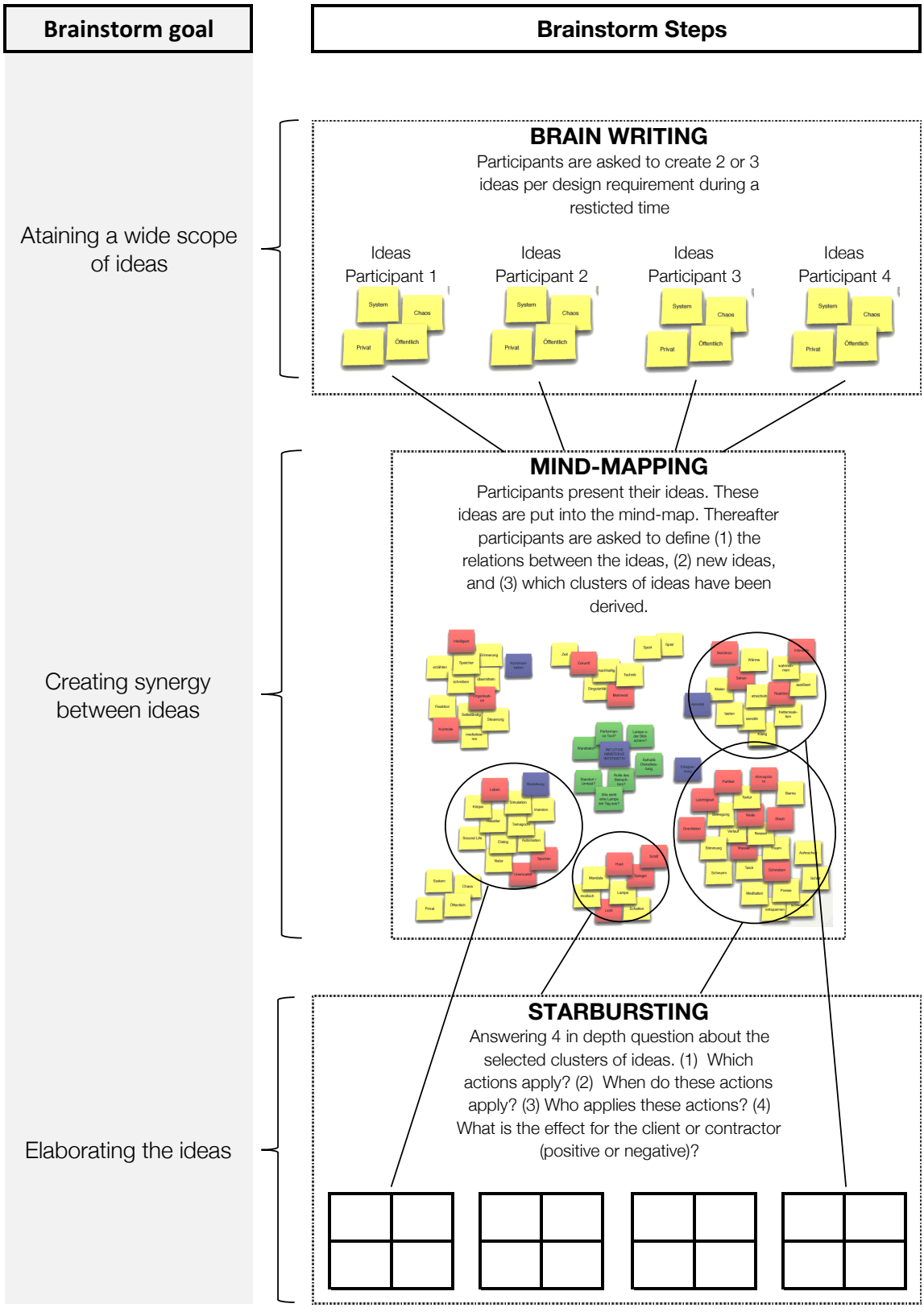


Figure 4: Overview of the brainstorm phase

Step A: Brain writing

Goal	This step comprehends two goals; (1) Getting a broad scope of answers to the focus question, so the sessions does not stick to only one or two ideas and (2) involving every participant in the session, to prevent participants from 'free-riding'.
Technique	During this step the brainwriting technique (individual brainstorming) is used. During this method all individual participants are asked to formulate an individual idea on a paper based the given requirement (Mindtools, 2009).
Implementation	During the brainwriting step the participants will be presented with the four focus questions (based on the four design requirements). The researcher will address this focus question by explaining which barrier it originates from (including supporting citations from literature). Thereafter, participants are asked to write 1 to 3 ideas on a post-it within 1 minute. Subsequently, the ideas are presented and collected in a mind-map. When all ideas are similar or only very conceptual, the process can be repeated. This process will be executed for all four focus questions. The purpose of this individual form of brainstorming is to enhance activity from each participant, thereby creating a broad scope of ideas. It is a conscious choice to start the focus groups by addressing each design requirement separately. Hereby the full range of barriers is discussed, increasing the validity the results. Participants are asked to used their own experience next to the elaboration resulted from literature. Therefore, the reliability of the results can be increased.

Step B: Mind-mapping

Goal	The goal of this step is to attain synergy between the ideas of the different participants.
Technique	Mind-mapping is the process of visualizing the relations between different ideas. This visualization has proven to inspire new ideas (or relations). Furthermore, the visualization will help to identify certain clusters of ideas(Mindtools, 2009).
Implementation	All individual ideas will be explained and collected in a mind-map during the brain writing step. Based on this current mind-map a discussion will be started respectively answering the following questions (which will be presented); 1. What are the relations between the ideas? 2. Are there ideas missing from the mind-map? 3. Which ideas can be clustered? These questions are used to optimize the value of the mind-map and to motivate an open dialogue between the participants. The visualization in the mind-map can lead to identification of new ideas. Furthermore, the identification of the relations between the ideas and discussion about this relations, can increase the reliability and validity of the results.

Step C: Starbursting

Goal	This step aims to attain an increased level of detail in which the ideas are developed. This contributes to the goal of the session; getting the answer on the research sub-question in a level of detail that has not yet been provided in literature.
Technique	Starbursting is a method to define more in depth information on the concepts (ideas) derived in a brainstorm. The method is used to derive and answer questions that defines the area of missing knowledge (Mindtools, 2009).

Implementation	The questions are pre-defined by the researcher. Before commencing this step, the participants are asked to select two or three ideas translated to the starbursting scheme on a big piece of paper. The following questions are addressed; 1. What are the core actions? 2. When do this actions apply? 3. Who performs this action? 4. What is the expected effect on the client or contractor (positive or negative)? During an open discussion the researcher motivates that all questions are addressed. The four questions are derived to enhance the level of detail and abstraction in which the ideas are formulated. Thereby increasing the usability and validity of the data that is collected in the sessions.

Composition of the focus groups

The focus groups are conducted using specifically selected procurement experts from different backgrounds. The composition of the focus groups is elaborated, explaining which participants were selected and why.

Setting and composition of the focus groups

To use the full potential of each participant while still promoting creativity in a group environment it is chosen to perform four focus groups in a small setting of three to four participants. The focus groups are located Twynstra Gudde. Fitting to the first language of the participants, the sessions are performed in Dutch. The composition of the focus groups was selected on the following two main criteria, focused on enhancement of the validity and reliability of the method.

1. All participants are experts in the field of European Procurement Procedures in the construction sector. Each participant therefore has considerable experience in designing procurement strategies and/or conducting procurement procedures.
2. To enhance creativity throughout the focus groups each group is composed out of participants with different backgrounds and perspectives. It is aimed to compose the groups with a variety of backgrounds to create discussion between the different perspectives and formulate ideas that not only represent one perspective. It is aimed to formulate groups with similar compositions, so all ideas are representable for a mixed set of perspective and can be compared without notification of different viewpoints. The following backgrounds are diversified;
   - *Procurement consultants*
     The basis of the focus groups is composed with one or two procurement and contracting consultants from Twynstra Gudde, as this group represents a relatively objective group with extensive experience in designing and performing procurement procedures.
   - *Procurement experts from client organizations*
     It is aimed to select one procurement expert from a public client organization per focus group. It is emphasized to select experts that are open to new procurement strategies and are actively involved in procurement procedures.
   - *Procurement experts form contractor organizations*
     Per focus group, it is aimed to select one procurement expert from the contractor's organizations in the construction sector. These participants were selected on their open view as well. These participants can also contribute with their knowledge in private procurement.
   - *Organizational consultants*
     For each focus group it was aimed to select one participant with expertise in organization-, collaboration- or change-management, who has been involved in procurement procedures. These participants have an open view towards the possibility of procurement procedures and can therefore contribute to the creatively of the focus groups.

The compositions of the groups are guided by these criteria. The diversification within the groups is achieved quite well. Though, for practical feasibility some concessions were made, causing some groups to miss certain backgrounds.

Appendix B.2 – Protocol focus group analysis

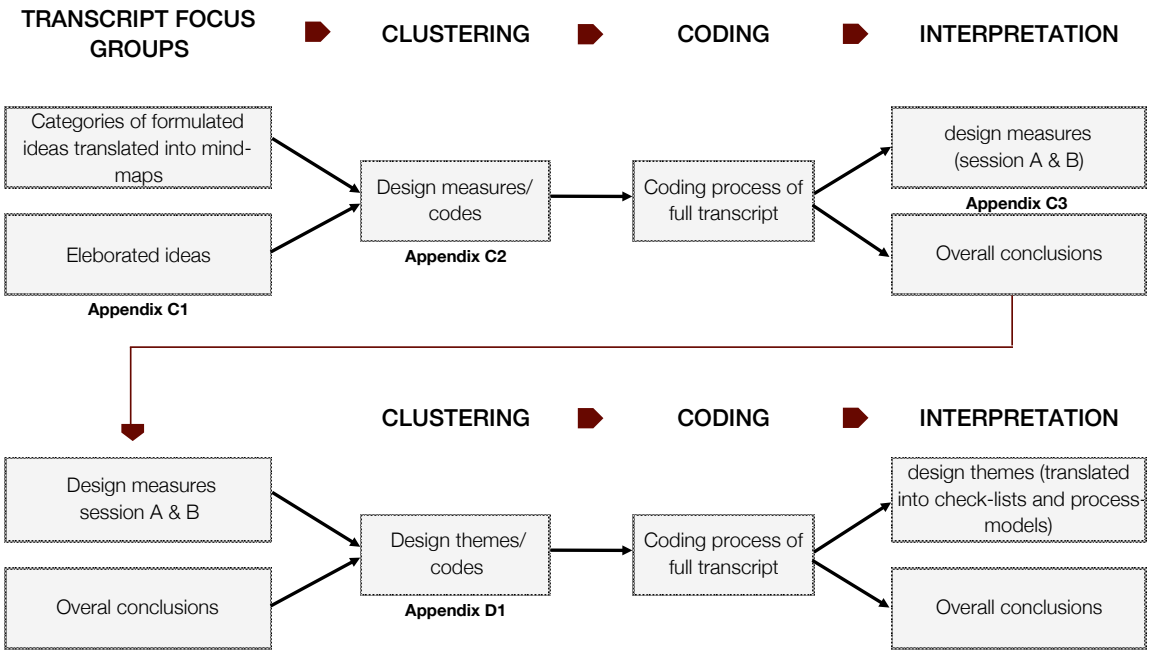
The entire focus group sessions are recorded and the mind-maps are photographed. This will serve as the basis of the analysis process.

The analysis of the focus groups will be executed in four steps;

1. *Transcription*
   The conversations, formulated ideas and construction of the mind-maps will be translated into a transcript. The mind-maps, shown in appendix C.1. give an overview of all the formulated ideas, including a notification of the ideas that were elaborated during the focus groups.
2. *Clustering*
   Due to extensive amount of data, the categories formulated in the mind-maps and the elaborated ideas will be used to filterer the core concepts of the focus groups; the design measures, see appendix C.2. These core concepts will be used for the coding process.
3. *Coding*
   The software Atlas.ti is used for coding the transcripts to the applicable codes. During the execution of the coding process the full transcriptions are searched to guarantee completeness and validity of the results.
4. *Interpretation*
   An overview will be made based on the quotations and memos for each code, added in appendix C.3. The summary describes the interpretation is provided in the report. Furthermore, some overall conclusions will be made based on some general findings (codes) that were interpreted in the coding process.

The analysis of the focus groups will first address the analysis between the two similar sessions, resulting in the design measures. Thereafter, a cross-analysis will be held between all four sessions, resulting in the design themes. The clustering step of this cross-analysis will be illustrated in appendix D.1. The interpretation of the design themes is translated into check-list or process models and some overall conclusions provided in the final design.

An overview of the analysis process is illustrated in the figure below.

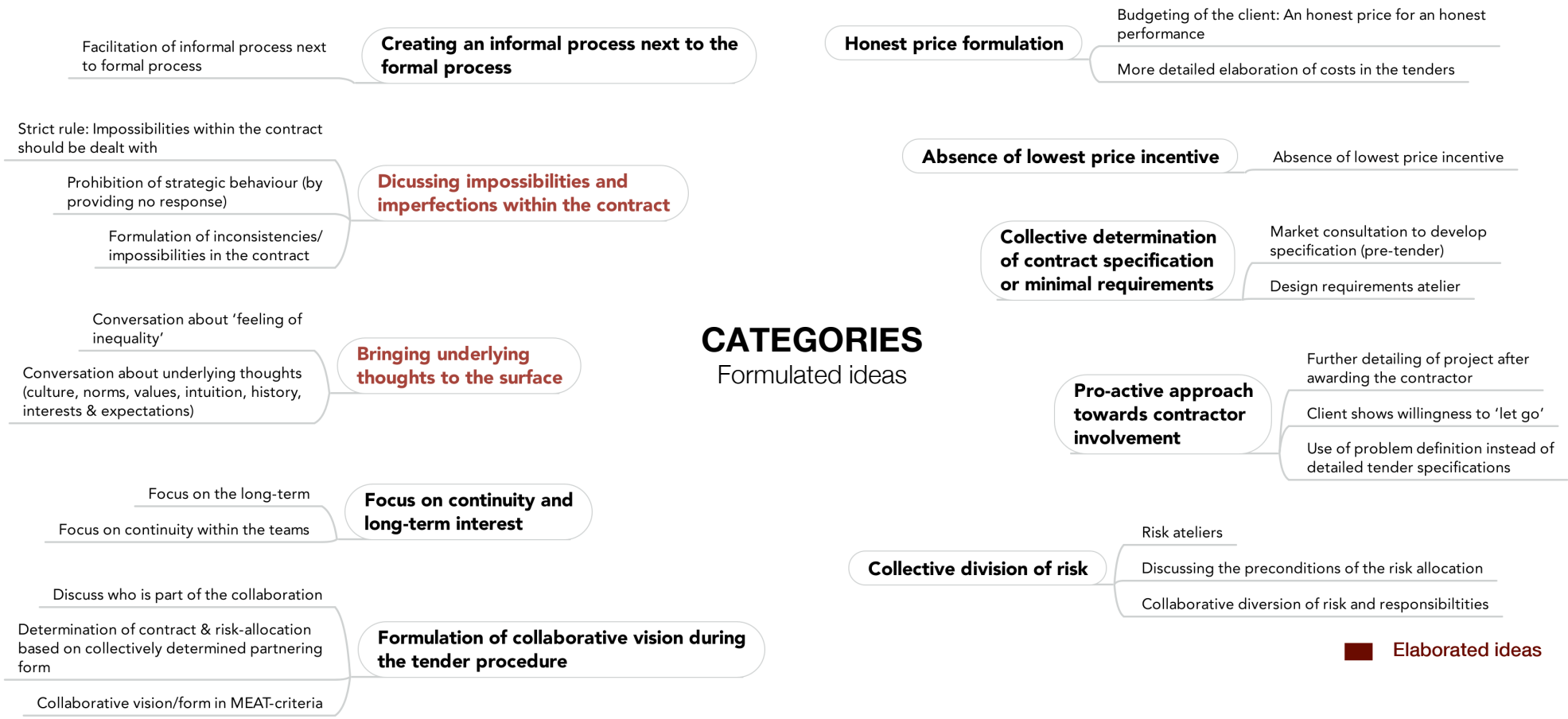


APPENDIX C
FOCUS GROUP ANALYSIS

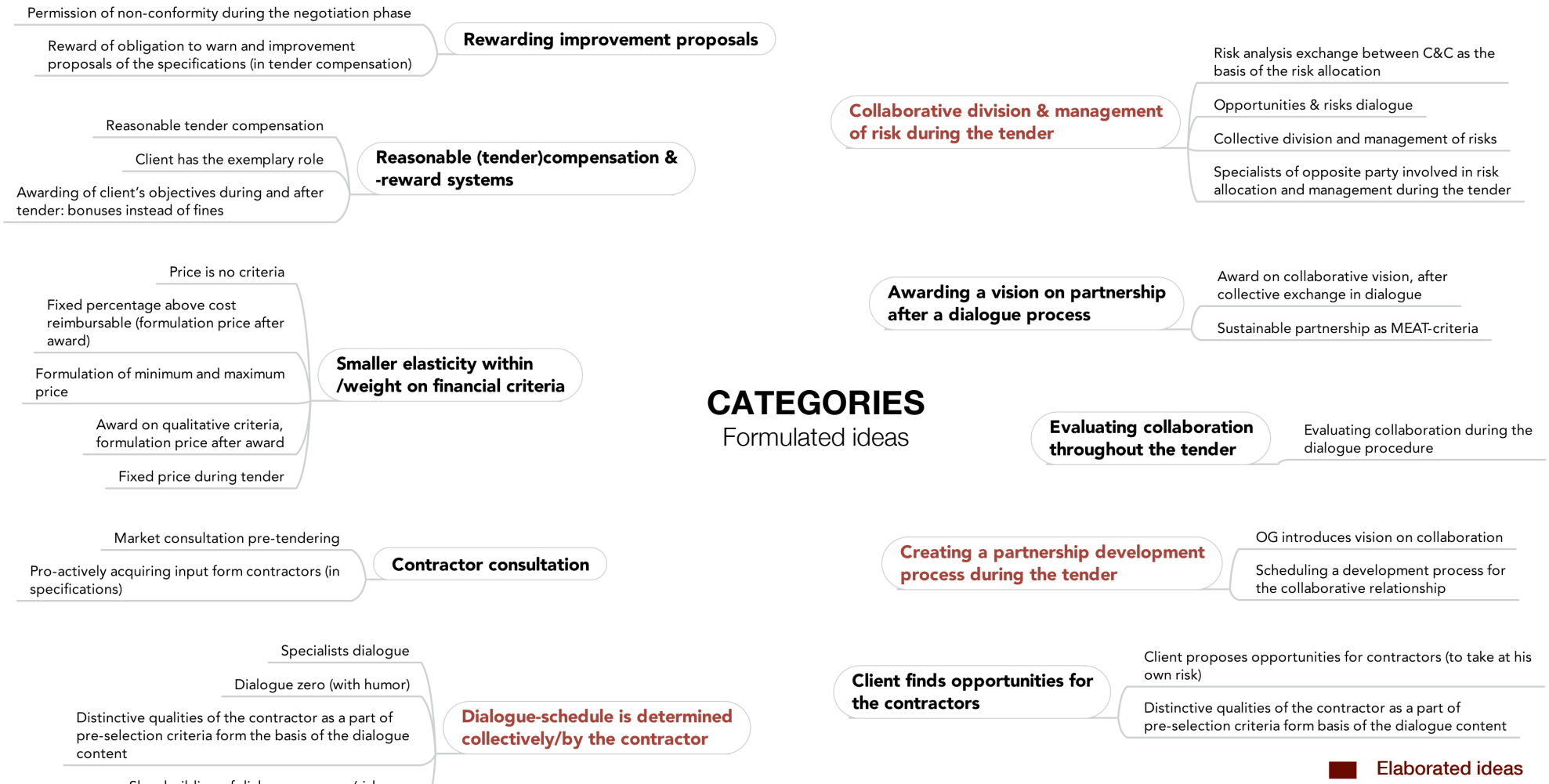
Appendix C.1. Focus groups mind-maps

The mind-maps of each focus groups show different categories of formulated ideas. The elaborated categories are indicated. All categories will serve as the basis for further analysis.

FOCUS GROUP 1 – SESSION A

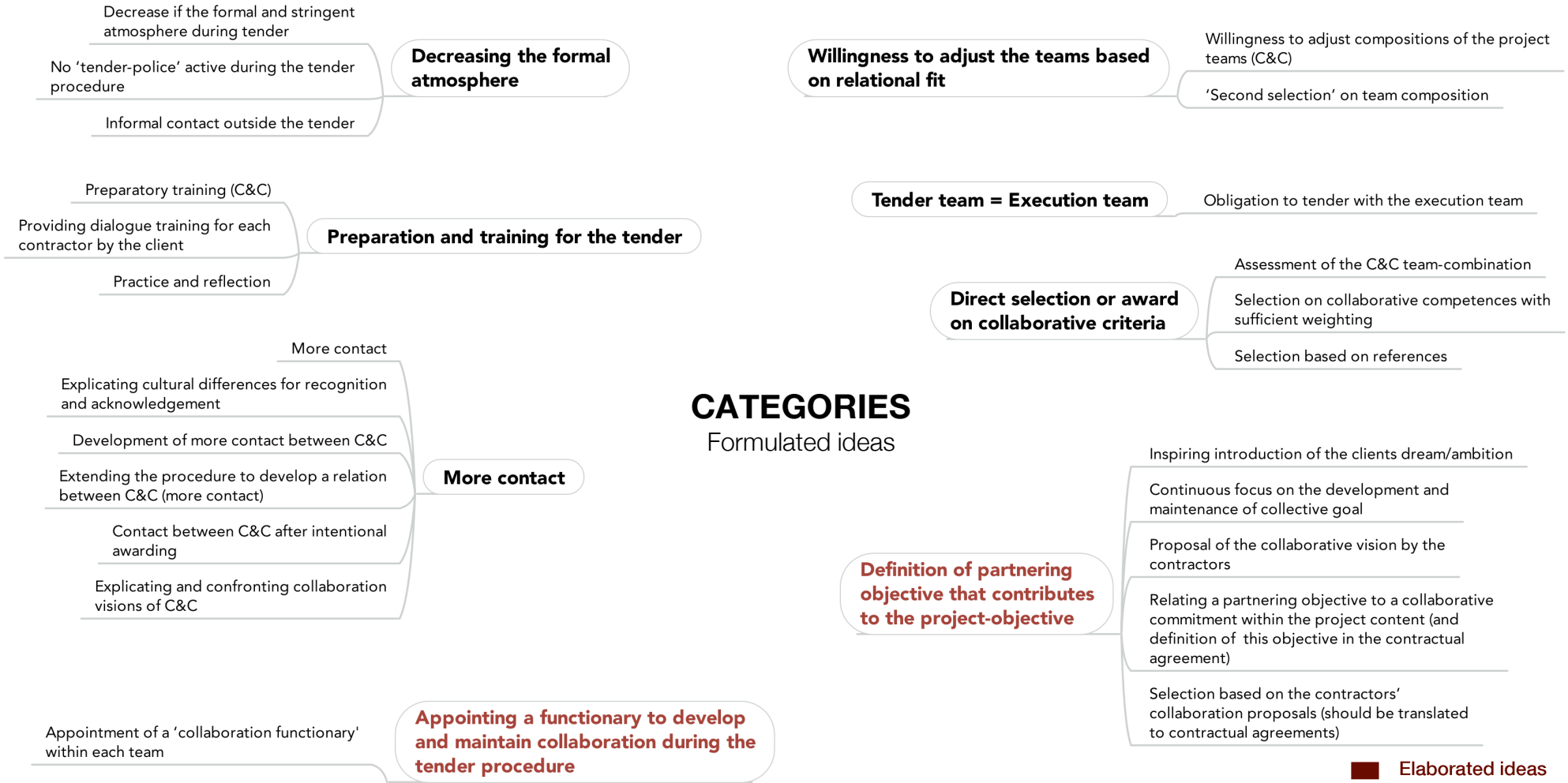


FOCUS GROUP 2 – SESSION A



FOCUS GROUP 3 – SESSION B

FOCUS GROUP 4 – SESSION B



Appendix C.2. Clustering the design measures

The following tables illustrate the clustering of all categories of formulated ideas, resulted from the focus groups. It is indicated which categories were elaborated during the sessions. The design measures serve as the codes used for a coding process.

SESSION A

Elaborated ideas

Categories Focus group 1	Design measures/codes	Categories Focus group 2
Dicussing imposibilities and imperfections within the contract	Motivation of the obligation to warn/improvement proposals	Rewarding improvement proposals
Creating an informal process next to the formal process	Facilitation of an informal process	
* Bringing underlying thoughts to the surface * Focus on continuity and long-term interests	Focus on values behind actions	
Honest price formulation	Honest compensation	Reasonable (tender)compensation & -reward systems
Absence of lowest price incentive	Absence of lowest price incentive	Smaller elasticity within- or weight on financial criteria
* Pro-active approach towards contractor involvement * Collective determination of contract specifications or minimal requirements	Pro-active contractor involvement	* Contractor consultation * Client finds opportunities for the contractors
	Collective determination of dialogue-schedule	Dialogue-schedule is determined collectively/by the contractor
Collective division of risks	Collaborative division/management of risks	Collaborative division & management of risks during the the tender
Formulation of a collaborative vision in the tender procedure	Collective definition of the formation & attributes of the collaboration	* Creating the partnerschip development process during the tender * Evaluating collaboration throughout the tender * Awarding a vision on partnership after a dialogue process
Formulation of mutual interests and collaborative goal	Definition of the substantive significance of the collaboration	

SESSION B

Elaborated ideas

Categories Focus group 3	Design measures /codes	Categories Focus group 4
Contact/ relationship building	Personal contact/ relationship building	More contact
	Creation of an informal atmosphere	* Decreasing the formal atmosphere * Preperation & training for the tender
Development of partnering goal during the tender	Award on a definition of a partnering objective	Definition of partnering objective that contributes to the project-objective
* Internal team selection and -preperation * Adapting the collective team after award	Adaptation of teams on 'relational fit'	Willingness to adjust the team based on relational fit
	Appointing a 'collaboration-functionary'	Appointing a functionary to develop and maintain collaboration during the tender procedure
* Combining project development and assesment on relational fit & -competences * Selection on relational criteria	Selection (or award) based on team-assessments or -tests	* Direct selection or award on collaborative criteria * Tenderteam = Execution team
Direct collaboration during the tender	Co-creation of the tender	
Reflection, evaluation & 'internships' between client & contractors	Experiencing the opposite perspective	
Collaborative shaping of the tender procedure	Collective definition of the tender procedure (contractor consultation/participation)	Market consultation

Appendix C.3 Overview of the design measures

The focus groups have resulted in multiple design measures, that have been used for a coding process. An overview the different measures is provided. This overview lists all applicable ideas to each measure. Furthermore, the effectivity of the design measures and the direction (limitation of which barrier) is indicated. This conclusion is based on the formulated citations, the origin of the ideas and the amount of ideas that were formulated. Lastly, it is notified when the measures derive liabilities concerning the existing culture or implementation in the European Procurement Directive.

Overview Session A – Focus groups 1 & 2

SESSION A

Barriers / design requirements;	
1	Persistence of own objectives (based on relational drivers)
2	Lack of commitment and mutual specification
3	Feeling of equality
4	Unclear definition of the partnering objective
BOLD	**Elaborated ideas (not directed to one barriers in particular)**

Design measures	Formulated ideas within the barriers (design requirements) 1 to 4		Focus Group	Interpretation	
				Direction	Effectivity
Motivation of obligation to warn/improvement proposals	1	Strict rule: Impossibilities within the contract should be dealt with	1	General	High
	1	Reward of obligation to warn and improvement proposals of the specifications (in tender compensation)	2		
	2	Prohibition of strategic behaviour (by providing no response)	1		
	3	Formulation of inconsistencies/impossibilities in the contract	1		
	Overall	**Dicussing imposibilities and imperfections within the contract**	1		
Facilitation of an informal process	2	Facilitation of informal process next to formal process *	1	General	Medium
Focus on values behind actions	3	Conversation about 'feeling of inequalities'	1	General	Medium
	overall	Conversation about underlying thoughts (culture, norms, values, intuition, history, interests & expectations)	1		
	overall	Focus on long-term interests	1		
	overall	Focus on continuity within the teams	1		
	1,3	**Bringing underlying thoughts to the surface**	1		
Honest Compensation	1	Budgeting of the client: An honest price for honest performance	1	General	High
	1	More detailed elaboration of costs in the tender proposals	1		
	1	Reasonable tender compensation	2		
	1	Client has the exemplary role	2		
	1	Awarding of client's objectives during and after tender: bonuses instead of fines	2		
Absence of lowest price incentive	1	Absence of lowest price incentive (small weight on financial criteria)	1	Barrier 1	High
	1	Price is no criteria	2		
	1	Fixed percentage above cost reimbursable (formulation price after award)	2		
	1	Formulation of minimum and maximum price	2		
	1	Award on qualitative criteria, formulation price after award	2		
	1	Fixed price during tender	2		
Pro-active contractor involvement	2	Market consultation to develop contract specification (pre-tendering)	1	Barrier 2	Medium
	2	Further detailing of project after awarding the contractor	1		
	2	Client shows willingness to 'let go'	1		
	2	Use of problem definition instead of detailed tender specifications	1		
	2	Design requirements atelier *	1		
	2	Permission of non-conformity during the negotiation phase *	2		
	2	Market consultation pre-tendering	2		
	2	Client proposes opportunities for contractors (to take at his own risk)	2		
	3	Pro-actively acquiring input form contractors (in specifications)			
Collective determination of dialogue-schedule	2	Specialists dialogue	2	Barrier 2	Low
	2	Dialogue zero (with humor)	2		
	2	Distinctive qualities of the contractor as a part of pre-selection criteria form basis of the dialogue content	2		
	3	Slow building of dialogue process (risks are discussed later in the process)	2		
	2	**Schedule of dialogues is determined collectively/by the contractor***	2		

Collaborative division/ management of risks	3	Risk ateliers	1	Barrier 3	High
	3	Discussing the preconditions of the risk allocation	1		
	3	Collaborative diversion of risk and responsibiltities	1		
	3	Risk-file exchange between C&C as basis of risk allocation	2		
	3	Opportunities & risks dialogue	2		
	3	Collective division and management of risks *	2		
	3	Specialists of opposite party involved in risk allocation a management during tender *	2		
	3	**Collaborative division & management of risks during the tender***	2		
Collective definition of the formation & attributes of the collaboration	3	Sustainable partnership as MEAT-criteria	2	Barrier 4	Medium
	3	Scheduling a development process for a collaborative relationship	2		
	4	Discuss who is part of the collaboration	1		
	4	Determination of contract & risk-allocation based on collectively determined partnering form*	1		
	4	Collaborative vision/form in MEAT-criteria	1		
	4	Evaluating collaboration during the dialogue procedure	2		
	4	Award on collaborative vision, after collective exchange in dialogue	2		
	4	OG introduces vision on collaboration	2		
	4	Scheduling development of collaborative relationship	2		
	4	**Creating the partnerschip development process during the tender**	2		
Definition of the substantive significance of the collaboration	2	Start conversation C&C about each objectives	1	Barrier 4	low
	2	Conversation about mutual objectives	1		
	2	Mutual objectives as part of MEAT-criteria	1		
	4	Discuss when collaboration is successful	1		
	4	Translation of mutual objectives in partnering goal	1		
	4	Define the scope of collaboration	1		
	4	Define a partnering objective bigger than the project	1		

* Possible liabilities concerning implementation in the European procurement directive

** Possible liabilities concerning implementation in the existing culture

Overview Session B – Focus groups 3 & 4

SESSION B

Barriers/ design requirements;

4 Unclear definition of the partnering objective
5 No (selection on) 'relational fit'
6 No selection on collaborative competence
7 Lack of expertise in performing a collaborative procurement phase
BOLD **Elaborated ideas (not directed to one barriers in particular)**

Design measures	Formulated ideas within the barriers (design requirements) 1 to 4		Focus Group	Interpretation	
				Direction	Effectivity
Personal contact/ relationship building	**4**	Contact about collaboration outside the tender procedure	3	General	High
	5	Creating attention for the process & time for contact between C&C			
	5	Presentations & Interviews	3		
	5	Informal project excursions*	3		
	5	Limited bid invitation	3		
	5	Explicating cultural differences for recognition and acknowledgement	4		
	5	Contact between client & contractor after intentional awarding	4		
	6	Extending the procedure to develop a relation between C&C (more contact)	4		
	6	Development of more contact between C&C	4		
	6	More contact	4		
	7	Explicating old assumptions between C&C	3		
Creation of an informal atmosphere	4	Collectively explicating difficulties concerning the mother organization		General	High
	5	Creating freedom for (informal) contact between C&C during the tender procedure*	3		
	6	Changing language	3		
	6	Decrease of the formal and stringent atmosphere during tender	4		
	7	Changing the attitude of procurement divisions	3		
	7	Preparatory training (C&C)	3		
	7	Providing dialogue training for each contractor by the client	4		
	7	Informal contact outside the tender*	4		
	7	No lawyers active during the tender procedure	4		
Award on a definition of a partnering objective	4	Collectively detecting one unique aspect as a partnering objective	3	Barrier 4	Medium
	4	Determination of a partnering goal in collaboration (C&C)	3		
	4	Definition of collaboration as the leading principle of the project	3		
	4	Developing a meaning to 'best-for-project'	3		
	4	Collectively explicating expectations (of the collaboration)	3		
	4	Collective determination of the partnering objective	3		
	4	Basing the partnering objective on a collective wish	3		
	4	Inspiring introduction of the clients dream/ambition	4		
	4	Continuous focus on the development and maintenance of collective goal	4		
	4	Proposal of the collaboration vision by the contractors	4		
	4	Explicating and confronting collaboration visions of C&C	4		
	4	Relating a partnering objective to a collaborative commitment within the project content (and definition of this objective it in the contractual agreement)	4		
	6	Selection based on the contractors' collaboration proposals (should be translated to contractual agreements)	4		
	4	**Definition of a partnering objective during the tender procedure**	3		
	4	**Definition of partnering objective that contributes to the project-objective**	4		
Adaptation op teams on 'relational fit'	5	Adjusting the client-team to the awarded contractor-team after awarding	3	Barrier 5	Medium
	5	Internal selection of project-teams before the tender procedure	3		
	5	Team-selection (C&C) after intentional awarding	3		
	5	Willingness to adjust compositions of the project teams (C&C)	4		
	5	**Adapting the collective team after award**	3		
Selection or award based on team-assessments or -tests	5	Selection on team interaction using collaboration assessments & testing	3	Barrier 5&6	low
	5	(Partial) selection on 'relational fit' during collaboration assessment	3		
	5	Creating hard selection criteria for 'relational fit'	3		
	5	Interviews between C&C, focused on relational aspects	3		
	5	Research into significance individual vs. team 'relational fit'	3		
	5	'Second selection' on team composition	4		
	5	Assessment of the C&C team-combination	4		
	6	Absence of price criteria in the tender (fixed price or unit rates)	3		
	6	Selection on minimum collaborative experience and competence	3		
	6	Team selections in contractor-teams (especially for consortia)	3		
	6	Collaboration assessments between C&C during the tender	3		
	6	Workshops with C&C during tender	3		
	6	Collaboration assessments and testing as selection criteria	3		
	6	Award on interviews, CV's and reputation (learning form commercial sector)	3		
	6	Selection on collaborative competences with sufficient weighting	4		
	6	Selection based on references	4		
	6	Obligation to tender with the execution team	4		
	5&6	**Combining project-development & assessments during the tender**	3		

Co-creation of the tender	5	Formation of tender proposal by C&C combined, after intentional awarding (selection on relational criteria)	3	Barrier 5&6	Low
	6	Client & Contractor develop tender submission collectively	3		
	6	Co-creation during tender (combining competence and substance)	3		
Experiencing the opposite perspective	7	Reflection on collaboration (mostly by contactor)	3	Barrier 7	Medium
	7	internship' at the opposite side for the client's contract manager	3		
	7	Training for the seniors by the juniors	3		
	7	Serious gaming used to learn the opposite perspective during a procurement	3		
	7	Development of a standard procedure	3		
	7	Practice and reflection	4		
Collective definition of the tender procedure (contractor consultation/participation)	4	Collectively dividing responsibilities and authorization within the team (in a RASCI)	3	Barrier 7	Medium
	4	Developing a conflict resolution technique	3		
	7	Focus on collaboration during the development of the procurement strategy	3		
	7	Contractor consultation	4		
Appointing a 'collaboration-functionary'	7	Appointment of a 'collaboration functionary' within each team	4	Barrier 7	Low
	7	**Appointing a functionary to develop and maintain collaboration during the tender procedure**	4		

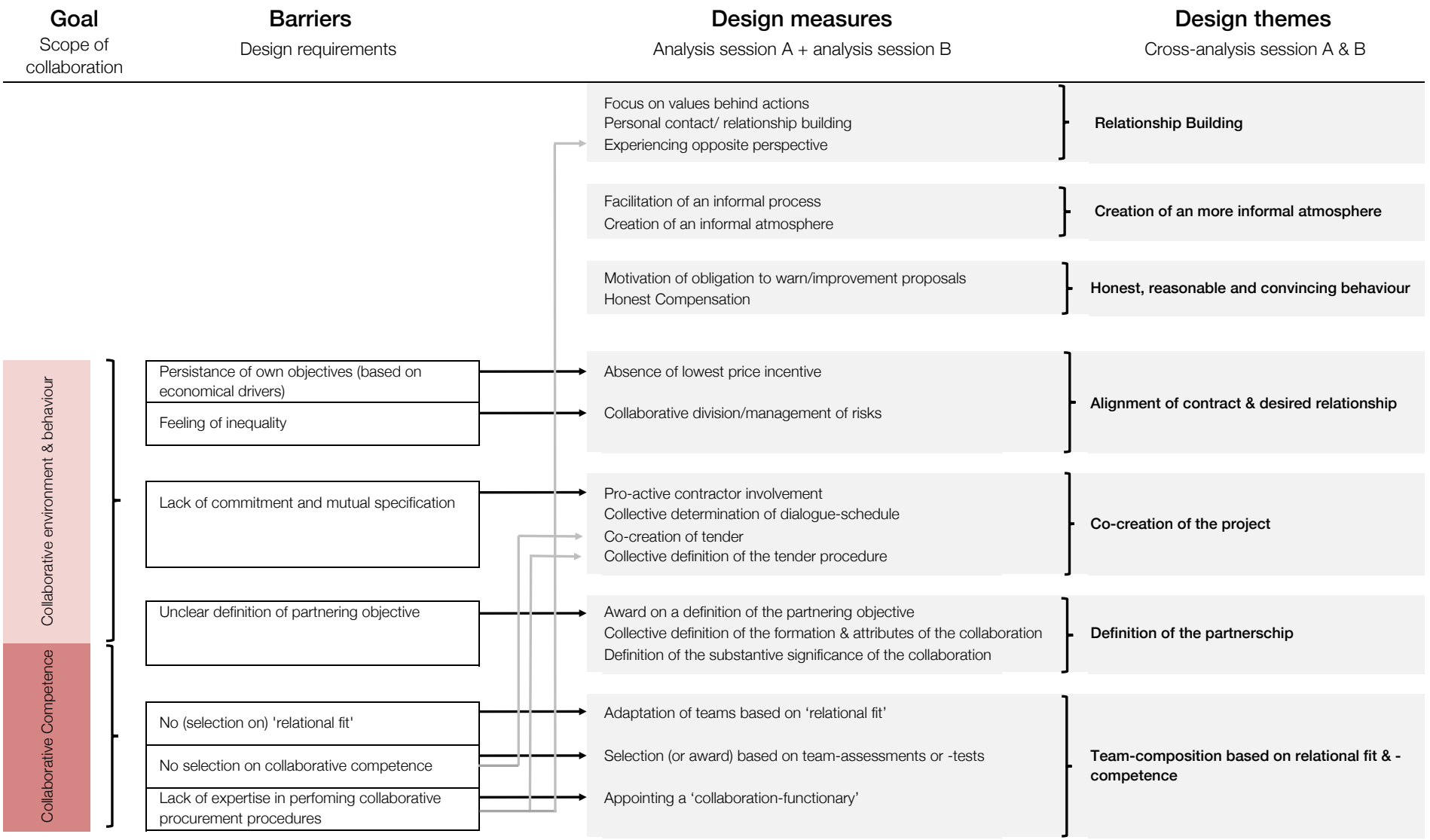
* Possible liabilities concerning implementation in the European procurement directive

** Possible liabilities concerning implementation in the existing culture

APPENDIX D
FOCUS GROUP CROSS-ANALYSIS

Appendix D.1. Clustering the design themes

In the following figure, it is illustrated how the design measures are clustered into design themes. Additionally, it is illustrated how the themes relate to the barriers and scope of collaboration.



APPENDIX E
EXPERT PANEL

Appendix E.1 - Protocol expert panel

In the third phase, an expert panel composed out of six of the focus group participants, is used to evaluate the design themes (and developed check-lists and process-models).

Goal of the expert panels

The goal of the expert panel is to find the answer to research sub-question 3a; *How do the users perceive the potential (effectivity, feasibility and preference) of the design themes for a collaborative procurement procedure?*

Two main aspects are considered to be relevant in acquiring this goal;

1. *Attaining the answer to the research (sub-) question to gather insights for the overall development of the design.*
   To gain understanding of the user's perception on the design themes, a clear presentation and evaluation method is required. As the topic is quite comprehensive and complex, the evaluation should not only be gathered individually, but should be discussed collectively.
2. *Validating the interpretations made in constructing the conceptual design;*
   The panel is used to validate whether the formulated check-lists and process-models fit the expectation and understanding of the focus groups participants.

Design of the expert panels

The expert panel is used to evaluate the design themes. The evaluation criteria and -method is explained.

Evaluation criteria

The expert panel is consulted to judge the formulated design themes on three criteria. The following criteria will be discussed;

1. Effectivity of the themes (and the measures within the theme) towards the formulated goal; increasing the potential for a collaborative relation between C&C. Insight in this criteria, enhances the validity of the results.
2. Feasibility of the theme (and the measures within the theme);
   Knowledge on this aspect contributes to the reliability of the results.
3. Preference between the themes (and the measures within the themes);
   Apart from the effectivity and feasibility of the different themes it is relevant to know something about the preference of the experts, as this also contributes to the potential of a certain theme. A high preference adds to the generalizability of the results.

Evaluation method

The evaluation of the themes is performed using individual ranking and a collective discussion. The expert panel is asked to give a rating to the themes, based on each criteria. It should be emphasized that the amount of participants limits the extent to which this rating should be interpret as a validated fact. Therefore, no definite decisions will be made based on this rating. The method is mostly used to provide tools for a successive discussion and provide a good overview of the evaluation. The discussion will be focused on the elaboration of the participant's opinion on each criteria and possible improvement area's within the themes.

Overview of the expert panel

The expert panel consist out of two parts, both part will be explained.

part		Primary goal	time
1.	*Short Introduction*	- Explanation of the panel - Introduction to the focus groups analysis	10 min
2.	*Expert Panel* *1st part - General themes* *2nd part - Directive themes* ***Both parts exist of;***	- Answering the research question (given the two most important aspects)	
	A. Presentation of the themes	- Explanation of the design themes	10 min (x2)
	B. Ranking/ notations by participants	- Enables participants to think about their opinion - Creating tools for the successive discussion	5 min (x2)
	C. Discussion	- Discussing the opinion of the experts and formulation of possible improvement areas.	20 min (x2)

Execution of the expert panel

Part 1: Short Introduction

The introduction of the panel is solely used to give a short explanation of the course of the panel. As all participants are familiar with the subject, only a short reminder of the research topic is necessary.

Part 2: Panel

The panel is executed in two parts. The first part reflects on the general themes, the other on the directive themes for a collaborative procurement procedure. This separation is made because the recommendation for the use of this themes is different. Therefore, the themes are not fully comparable. The panel for both the general as the directed themes is executed in three steps;

1. *Presentation*

The presentation will introduce the separate themes introducing all the combinations that can be made. To keep this process feasible in the given time, only the main ideas will be shown. All different intensities within the measures will be left out of the model, as it is impossible to discuss all measures.

2. *Ranking*

All participants will get a ranking form to rate each theme on the three formulated criteria. This method provides the possibility for the participants to get a minute to think about each theme a give an informed opinion. As the ranking mostly serves to get an impression and to form a basis of discussion, on relatively simple scale (1 tot 5) is used. Additionally, space for additional notes is provided, to elaborate on this in this opinion and name possible improvement points.

3. *Discussion*

In the discussion, the researcher will motivate the participants to elaborate on their formulated ranking in reference to the three criteria. As not all opinions can be discussed, the researcher leads the discussion. The discussion will address each criteria separately, discussing the most extreme outcomes (most and least effective, feasible or preferable themes). Hereby, the researcher will motivate the formulation of possible improvement areas or windows of opportunities.

Appendix E.2 – Ratings expert panel

In the following table shows the ranking given by the expert panel. Six participants have rated each design theme based on effectivity, feasibility and preference.

Effectivity	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Average
General themes							
Relationship Building	4	3	3	5	4	4	3,83
Creation of a more informal atmosphere	4	3	5	5	4	3	4,00
Honest, reasonable and convincing behaviour	4	4	4	4	5	3	4,00
Directed themes							
Definition of the partnerschip	4	4	4	4	4	4	4,00
Team-composition based on relational fit & -competences	5	3	2	5	2	5	3,67
Co-creation of the project	4	5	5	5	5	4	4,67
Alignment of contract & desired relationship	5	5	5	5	5	5	5,00

Feasibility							
General themes							
Relationship Building	4	4	3	5	3	4	3,83
Creation of a more informal atmosphere	5	5	5	2	4	4	4,17
Honest, reasonable and convincing behaviour	3	5	3	4	5	3	3,83
Directed themes							
Definition of the partnerschip	5	5	4	5	4	5	4,67
Team-composition based on relational fit & -competences	4	3	4	3	2	4	3,33
Co-creation of the project	3	3	3	2	3	4	3,00
Alignment of contract & desired relationship	4	5	5	5	4	5	4,67

Preference							
General themes							
Relationship Building	4	4	5	5	3	4	4,17
Creation of a more informal atmosphere	5	5	5	5	5	4	4,83
Honest, reasonable and convincing behaviour	4	5	5	5	5	4	4,67
Directed themes							
Definition of the partnerschip	4	5	3	5	4	4	4,17
Team-composition based on relational fit & -competences	5	4	3	3	3	5	3,83
Co-creation of the project	5	5	5	3	5	5	4,67
Alignment of contract & desired relationship	5	5	5	5	5	5	5,00