

# CONTRACTUAL PORTFOLIO APPROACH IN CIVIL ENGINEERING

*AN EXPLORATIVE CASE STUDY RESEARCH INTO THE  
BUNDLING OF MULTIPLE WORKS INTO ONE INITIAL  
TENDER*

Master's thesis  
Construction Management & Engineering  
Faculty of Civil Engineering & Geosciences  
TU Delft

By  
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AUGUST 2023

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*August 2023*



# ACKNOWLEDGEMENTS

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In front of you lies the report of the master's thesis that studies the contractual portfolio approach in the civil engineering sector. This research is the culmination of seven months of research, and a total of five years of studying at the TU Delft. In these five years and especially in the last seven months, I devoted a lot of time and effort to my study at the TU Delft, which I hope is reflected in the end-result.

Hereby I would like to express my sincere gratitude to my graduation committee. The day-to-day assistance of Leon Hombergen and Erik-Jan Houwing in combination with Evelien Bruggeman who kept an overview and safeguarded the legal perspective, as well as Rudolf Rijkens and Koen van Limbergen with their practical guidance has proven to be pivotal for the success of this research.

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It is my hope that the findings of this research will prove to be a useful addition to the existing body of knowledge regarding this topic, and will provide guidance for clients in the construction sector who consider the implementation of a contractual portfolio approach.

The graduation committee, whose contribution is hereby gratefully acknowledged:

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# SUMMARY

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The Dutch construction sector is confronted with a complex and challenging situation. The majority of the infrastructural elements in the Netherlands were built in the 1950s and -60s, which means they are approaching the end of their lifespan. This state, in combination with backlogged maintenance and budget cuts, created a significant and urgent renovation and replacement wave that the construction sector is now facing. Additionally, a variety of other challenges exacerbate the complexity of the situation. The sector's substantial emissions of nitrogen and CO<sub>2</sub> imposes the need for a different way of working, while at the same time a tight labour market and high material prices hamper its functionality. All of this in a sector that is still characterised by its limited learning capacity, where relations between clients and market parties are not always considered as healthy.

This situation asks for adjustments in the way the sector operates. Stakeholders within the industry acknowledge this necessity and are developing strategies on how to shape these adaptations. One of the key solutions emerging in this context is the adoption of the contractual portfolio approach (CPA). This approach, where multiple works are bundled and procured in one initial tender, shows potential to tackle the renovation and replacement wave in an efficient manner, while at the same time stimulating sustainable innovation and creating a healthier situation in the sector. However, the contractual portfolio approach is a relatively novel strategy, with which stakeholders in the sector have limited experience. Therefore, more knowledge is required on how to implement the contractual portfolio approach in an effective manner.

This study aims at gathering this required knowledge by characterising the approach, defining the objectives that clients pursue when implementing it, describing the options clients have within the approach and finally analysing how choices can be made in such a way that these objectives are reached. In order to do this, the following main research question is addressed:

*MQ: How can a client involved in a contractual portfolio approach effectively align its decisions with the objectives it set on a portfolio level?*

To address this question, a comprehensive literature review and case study are conducted. The literature review serves as the initial step, aiming to identify the problem, relevance and context of the situation. Then, literature is used to define a theoretical framework that forms the foundation for the case study. In this case study, six cases are assessed in which a form of CPA is implemented. This is a set with a large variety in objectives, clients, scopes and forms, ranging from a large amount of simple objects combined in a framework agreement by a local governmental organisation, to a limited amount of complex objects in a repeat order, initiated by the national government. The diversity of these cases allows for comparison between different situations, which is particularly valuable in the context of an industry where all parties mostly reason merely from their own perspective. Within the case study, interviews are conducted with individuals in relevant positions, in order to gather the required knowledge.

As a result of this research approach, several interesting findings emerged. Firstly, the definition of the contractual portfolio approach is formulated as follows:

*The bundling of a logical set of similar works into one initial tender, with the purpose of reaching certain work-transcending objectives.*

The different parts this definition is comprised of, define the characteristics of the approach. A situation without a form of bundling, without works or without the aim to reach certain overarching objectives, is not defined as a contractual portfolio approach. Next to that, the

reveals how the approach can be positioned compared to similar approaches. The programmatic approach and the portfolio approach are considered as broader strategies, whereas performance management and the framework agreement are considered as choices that can be made within a CPA.

Additionally, an overview is made of the objectives clients pursue with the implementation of the CPA and a description is given of the way in which these objectives can be influenced. This starts with the notion that clients tend to have too many objectives in mind, which results in a lack of focus. Next to that, it is relevant to acknowledge that CPA is often implemented as an answer to the sector's shortcomings regarding client-contractor relations, while at the same time using CPA effectively to provide an answer to these shortcomings has proven to be difficult. Regarding concrete client objectives, eight main objectives are identified, shown in the figure below.

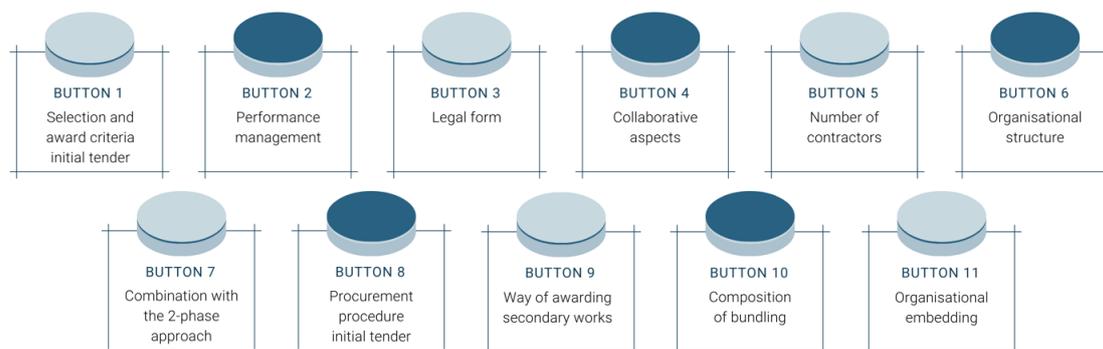
Figure S-1 - Main objectives (made by author)



These objectives are interrelated, both with each other and with other significant factors in a CPA situation. For the enhancement of standardisation and uniformity, continuity in the portfolio is essential, which in turn is influenced by the working pleasure experienced by the actors involved. Achieving sustainability and innovation, reducing risk and increasing efficiency requires a learning curve and often involves closer collaboration, and ensuring certainty requires the elimination of conditionality.

Besides these objectives, the study presents choice options available to clients within the CPA. Clients tend to lack an overview of the options that transcend their own organisation. By adopting a holistic perspective, the research identifies a comprehensive set of eleven choice options that clients can utilise to influence the attainment of these objectives. These choice options can be seen as buttons the client can turn into the desired position. Figure S.2 illustrates these choice options.

Figure S-2 - Choice options as buttons (made by author)



The way in which the positioning of the buttons influences the objectives of the client, varies depending on each specific button. Selection and award criteria can be formulated in such a way that objectives on the portfolio level are incorporated in these. The legal form mainly depends on the task whereas collaborative aspects can increase working pleasure which in turn creates a form of continuity, while at the same time enhancing trust and incentivising the contractor to invest. The organisational structure influences the attainment of portfolio objectives by adding an organisational portfolio level and can at the same time help with organisational embedding, where the latter streamlines the handover process to the asset management department and makes it possible to communicate successes with line management.

Some choice options within the CPA can confront the client with a dilemma. This happens when a certain position of the button has a positive effect on a certain objective, but a negative one on another. This happens with the implementation of performance management. Choosing this option provides the client with a certain level of control over the quality of the portfolio, while at the same time hampering the certainty for the contractor, leading to a decreased willingness to invest. A similar trade-off is presented by the way of awarding secondary works. If this is done on the basis of performance or even competition, it increases the client's control, but decreases the contractor's certainty and in case of multiple contractors, their willingness to share information. Additionally, including multiple contractors in the portfolio decreases the risk for the client, but at the same time hampers close collaboration. Lastly, increasing the scope of an individual work creates the possibility to exploit additional opportunities and to limit disruption. However, doing so makes it challenging to create standardised work packages that enhance a cross-project learning curve.

Concluding, clients can adopt the contractual portfolio approach as a way to achieve a variety of objectives. From sustainability to efficiency, and from risk reduction to standardisation. To effectively do this, it is important to explicitly define objectives and limit these to the most important ones. Furthermore, it is important to consider all the available choice options and to position the buttons in a way that it aligns to both the portfolio situation and the specific objectives. Ultimately, it is vital to consider the circumstances of the specific case and to carefully weigh the trade-offs associated with certain trade-offs.

In specific terms, clients are advised to bundle their works based on similarity and market capacity while at the same time creating an interesting portfolio for market parties. Next to that, they should involve the asset management department in the portfolio, base the portfolio objectives on organisational ones and incorporate portfolio objectives in selection and award criteria. Furthermore, they are recommended to secure the continuity of the portfolio by safeguarding working pleasure, creating a continuous workflow or by embedding the portfolio in the organisation. Then, if the dilemma of creating a standardised workflow versus exploiting additional opportunities occurs, clients are advised to create two separate 'tracks' of development, in which track 1 handles a standardised core of the portfolio, and track 2 provides room for additional opportunities, without hampering the flow of track 1. Lastly, these recommendations are summarised in the CPA Decision Guideline, a tool that can support clients in their decision-making process. Therefore, clients are advised to use this guideline when implementing a CPA.

By applying the recommendations of this research and utilising the CPA Decision Guideline, clients in the civil engineering sector are placed in the position to effectively implement a CPA and with this to concur the challenges the sector is currently facing.

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## LIST OF ABBREVIATIONS

Aw	Aanbestedingswet (Procurement law)
BIM	Building Information Modelling
CME	Construction Management & Engineering
CPA	Contractual Portfolio Approach
ECI	Environmental Cost Indicator
EMAT	Economically Most Advantageous Tender
GWW	Grond- Weg- en waterbouw (earth- road- and waterworks)
OG	Opdrachtgever (client)
ON	Opdrachtnemer (contractor)
PIANOo	Professioneel en Innovatief Aanbesteden, Netwerk voor Overheids – opdrachtgevers (procurement expertise center)
PTZ	Project Tunnels Zuid-Holland
R&R	Renovation & Replacement
RWS	Rijkswaterstaat (Dutch infrastructure authority)
SDG	Sustainable Development Goal
SMART	Specific, Measurable, Achievable, Relevant and Time-bound
SME	Small and Medium-sized Enterprise
TNO	Nederlandse Organisatie voor toegepast-natuurwetenschappelijk onderzoek (research institute)
WDOD	Waterschap Drents Overijsselse Delta (Water board)
ZEBRA	Zeeland Brabant

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# INTRODUCTION

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The first chapter serves as an introduction to this research. Firstly, the context of the subject is described in order to facilitate a better understanding of its origins. Then, a translation is made from this contextual understanding to the identification of the actual problem. Following this, the chapter presents the relevance of the research from both a societal and an academical perspective. The research set-up is then outlined, in which the central research questions and research goal are discussed. Additionally, the scope of the research is specified, after which the chapter is concluded with an outline of the remainder of the report.

## 1.1. Context

In this section, the context of the problem is described, by explaining the current situation and the developments in the sector as a reaction to this situation.

### 1.1.1. Global and national challenges

Currently, the environment in which the Dutch construction sector operates is becoming increasingly complex. The Netherlands is already one of the most densely populated countries in Europe (Centraal Bureau voor de Statistiek, 2022b), and with factors such as migration, this density is likely to increase over the coming years (Centraal Bureau voor de Statistiek, 2022a). The current housing shortage is a very evident result of this, where at the same time the increase in single-person households escalates the pressure on the housing market (Groenemeijer et al., 2021). However, the increasing density also has an impact on infrastructure, as the possibility to create new structures is becoming more and more limited, while the pressure on existing ones is only increasing. In the construction sector, this discrepancy is experienced as an urgent problem, which, for example, is illuminated by a letter the VNO-NCW, the largest employers' organisation in the Netherlands, addressed to the parliament. In this letter, they express their concerns regarding the accessibility of the Netherlands (Wieseahn, 2022). In light of spatial limitations, constructing new infrastructure cannot be the answer to this problem of accessibility. Instead, a large emphasis on redevelopment, renovation and replacement is needed (Glumac et al., 2013).

This transition towards adapting existing structures is further reinforced by another significant trend in the sector. A substantial part of the Dutch infrastructure, constructed in the 1950s and -60s, is approaching the end of its lifespan and is therefore almost due for renovation (Bleijenberg, 2021). Moreover, a structural policy of deferring maintenance, renovation and replacement in combination with budget cuts has only exacerbated this need, turning it into a large problem for the Netherlands (van den Boomen et al., 2019; Bouwend Nederland, n.d.; de Ingenieur, 2022). This problem is reflected by several malfunctioning infrastructural elements, leading to delays and other inconveniences for the public (RTLnieuws, 2022). An illustrative example of this is the Haringvlietbrug, where backlogged maintenance resulted in a reduction of the speed limit from 100 to 50 km/h and the traffic to be directed over one instead of two lanes, in order to make the necessary renovation possible (Rijkswaterstaat, 2021b). Furthermore, similar trends are observable beyond the borders of the Netherlands. Hall et al. (2016) for example describe a similar trend in the UK, and even though it is aimed at buildings instead of infrastructure, the EU presented a renovation wave strategy in 2020 as well (European Commission, 2020).

This large challenge concerning renovation and replacement of infrastructure has to be seen in the light of other issues in the sector. To start, the construction sector is a large consumer of materials and a significant contributor to pollution (Klein Woolthuis, 2010). Especially in the Netherlands, where a significant portion of the population resides below sea level, the need to prevent the climate from changing even further is evident (Olsthoorn, 2008). Thus, minimising CO<sub>2</sub> emissions is of great importance. Additionally, the construction sector is a large emitter of nitrogen, which has a negative effect on nearby nature reserves (Xiankai et al., 2008). Thereby, the pressure on the construction sector to decrease its negative impact on the environment is intensified.

Next to this, the sector is facing a shortage of workforce and escalating material prices, both of which hamper the development of the sector and hinder meeting the increasing demand (Bouwend Nederland, n.d.b.; Ministerie van BZK, 2023). For instance, the price of steel has increased by 75% between the beginning of 2021 and now (Dirkse, 2022). This together with 69 vacancies per 1000 jobs in 2022 compared to 9 per 1000 in 2012 (Centraal Bureau voor de

Statistiek, 2022). Therefore, efficiency is needed to reduce material usage and to limit the required labour force.

Last of all, an essential observation that has become increasingly apparent in recent years, is that the construction sector's project-based character limits its learning capacity (Barrett, Abbt & Ruddock, 2007; Gann & Salter, 2000). This limitation results in a lack of sustainable innovation and the sector's efficiency lagging behind compared to other sectors (de Bruin & Maas, 2005). Learning between projects is important for a well-functioning construction sector, and currently, this demand is not adequately fulfilled (Titov et al., 2015).

This complex situation with pressing challenges requires adaptations to the way the sector operates. Sustainable innovation is needed in order to tackle climate-induced challenges, and the sector must strive for greater efficiency (Oluwole Akadiri & Olaniran Fadiya, 2013; Pries & Dorée, 2011), since demand is increasing while labour is only getting scarcer (Bouwwereld, 2022; Brucker Juricic et al., 2021).

### 1.1.2. Developments in the sector

An important driver of the functioning of the sector is the relation between clients on the one hand and market parties on the other. In the past decades, both sides of this spectrum were dissatisfied with the cooperation in the sector, which only enlarged the existing problems (Rijkswaterstaat, 2019). The strategy of clients up to around 2015 can be characterised as 'the market unless', meaning that as much responsibility as possible was transferred from clients to market parties (COB, 2019). This strategy resulted in the formation of very large and complex contracts and sometimes included adverse incentives. For example, negotiations in the sector were overly price-driven, resulting in the lack of monetisation of risks (Rijkswaterstaat, 2019). In this period, market parties retained a negative perception of cooperation with public clients (du Saar, 2022).

In recent years, the sector aimed more at adapting its way of working in order to cope with the present-day challenges and to improve relations between clients and market parties. In this context, RWS, with the assistance of McKinsey & Company, formulated the challenges and possible solutions that RWS, being one of the most important clients in the sector, faces (Rijkswaterstaat, 2019). This study included four main conclusions:

- > Decrease project risks with a '2-phase approach', in which price determination is only done after design and engineering.
- > Improve boundary conditions like prescribing innovations and designing constructive dialogues.
- > Respond adequately to opportunities that new technologies offer, by enhancing the position of technological focused companies.
- > Introduce a contractual portfolio approach for projects with a repetitive character.

This study will focus on the last conclusion, the contractual portfolio approach (CPA). With this approach, multiple projects are bundled into one tender. This concept, along with the entire report, received considerable attention in the sector. Multiple clients incorporated the main findings in their policy, including RWS, who wrote a 'guidebook contractual portfolio approach' (Dutch: handreiking contractuele portfolioaanpak) in order to define the what, how, when and why of this approach (Rijkswaterstaat, 2021a). In this guidebook, RWS outlines certain possible benefits of the contractual portfolio approach, such as cost reduction. In literature, a variety of these benefits can be found as well. With bundling, clients and market parties engage in longer-term relations, which has proven to have multiple benefits, like increased efficiency and learning capacity (Ingirige & Sexton, 2006). Additionally, the portfolio approach can particularly be interesting in the current context of climate change, since closer collaboration has the potential

to enhance sustainable innovation (Blome et al., 2014; de Man & Duysters, 2005). Moreover, enabling market parties to divide their resources over multiple project has the potential to enhance efficiency and innovation, which is very important in the current situation of limited innovative capacity and scarce resources.

## 1.2. Problem formulation

The contractual portfolio approach is considered by various parties in the construction sector as one of the solutions for the problems they are currently facing. Implementing CPA for a set of similar works that requires renovation or replacement has several benefits that form an answer to present-day challenges. Multiple clients in the sector acknowledge this potential and are experimenting with the implementation of CPA. However, the sector still has a large distance to cover in becoming a thriving industry. This is highlighted by a parliamentary letter minister Harbers of the Dutch Ministry of Infrastructure and Water Management addressed to the parliament in June of this year. In this letter, he rehearses the importance of CPA, but also acknowledges that the gained experience with this approach is still very limited (Harbers, 2023). This amplifies the current problem that this research tries to address, which is:

*The contractual portfolio approach is a vital solution for present-day challenges in the construction sector, but clients lack the necessary knowledge to implement it successfully.*

## 1.3. Relevance

This section describes the relevance of this research, both from a societal and from an academical perspective. The first perspective is tackled by determining the benefits of the CPA for society and why this research is needed to enhance these benefits. The latter is done by describing the research gaps that can be identified in the existing body of knowledge, and by linking the research to the curriculum of Construction Management & Engineering.

### 1.3.1. Societal

This subsection sketches the added value of this research for society. This is done by firstly describing the added value of the contractual portfolio approach itself, and then by determining why this research is needed to implement the approach in a better way. With this, a direct link is established with the challenges as described in the previous chapter.

Bundling projects is something that has already been done for a long time. In different sectors and with different goals in mind, including the construction sector. However, the current state of the sector with its complex challenges, requires a specific focus on bundling in this context. The contractual portfolio approach is a much needed answer to the present-day challenges in the sector, and can have a multitude of benefits.

To start, it is crucial to acknowledge that the contractual portfolio approach offers a solution to a large challenge the construction sector is currently confronted with. This challenge consists of a major wave of renovation and replacement that has to be tackled within a complex market (Bouwend Nederland, 2021). In 2022, the Dutch Ministry of Infrastructure and Water Management made an estimation of costs of renovation and replacement for RWS in coming years (Klatter, 2022). This report states that around three times as much budget is needed for the conservation of existing infrastructure compared to the current situation. This observation is also underlined by research institute TNO, which made a prognosis for the whole sector (Bleijenberg, 2021). In this report, the researchers state that from 2040 to 2050, around 4 billion euros per annum is required for the conservation of infrastructure as opposed to the 1 billion euros that is currently available. These renovation and replacement tasks lend themselves perfectly for the CPA, since they are often repetitive and comparable and therefore easy to bundle (van den Hurk & Verhoest, 2014). By implementing CPA, this potential is used by bundling multiple renovation and replacement works in one initial tender and

with this improving the efficiency of the sector (Qiao et al., 2018). In their ZEBRA initiative, Rijkswaterstaat and the provinces of Zeeland and Brabant collaboratively estimated that the Netherlands has 34.000 concrete viaducts in total, of which 80% has the potential to be procured in a bundled manner (Rijkswaterstaat, 2023), and these three parties are not the only clients considering the approach. The Dutch rail authority ProRail and multiple municipalities, provinces and water boards have all recognised the significance of this approach in addressing the challenges at hand (Gemeente Amsterdam; Noord-Holland, n.d.; ProRail, 2020; Rijkswaterstaat, 2021; WDODelta, 2022).

Next to the importance of the approach for tackling the renovation and replacement challenge, CPA has other advantages making it a societal relevant solution. To start, multiple studies claim that the bundling of different projects into a single tender can lead to cost reductions. This effect has been demonstrated in road construction (Miralinaghi et al., 2021), but goes for the construction of bridges as well (McCarthy et al., 2011; Qiao et al., 2018). Moreover, the cost reduction effect of the CPA is two-folded. On the one hand, procurement costs are reduced because multiple procurement procedures are substituted by one (Scott Stanford et al., 2020). This is pivotal in the present-day construction sector, where procurement costs are considered as an important cost item that does not directly benefit the constructed element itself (Akintoye & Beck, 2009; Cobouw, 2014; Yescombe, 2007). On the other hand, because of aspects like economies of scale, contractors can reduce development costs, potentially resulting in a more beneficial tender offer (Trautmann et al., 2009). Rijkswaterstaat expects the implementation of CPA to bring about a cost reduction of around 10% (Rijkswaterstaat, 2023). Since most clients in the construction sector are public organisations, tax-payer money is at stake, which enlarges the societal relevance of this cost reduction. Other studies sketch an even brighter picture. Fazekas and Blum (2021) for example compared different procurement intervention types according to their effects on cost reduction, and concluded that centralised procurement and framework agreements exhibit the largest effects, surpassing 50% cost reduction.

The substitution of multiple tender procedures by a single one does not only influence costs. It also reduces the burden for clients to review tender proposals (Scott Stanford & Molenaar, 2020). This on its turn, has an effect on the required labour force, which is an important aspect in today's tight labour market.

Moreover, CPA has the potential to limit the duration of a project. Xiong et al. (2017) state that by bundling projects, different works can be done efficiently after one another, which results in a reduction of the project duration. Because most renovations require some form of decreased accessibility, limiting construction time has a substantial positive effect for society.

Lastly, working together for a longer time generally improves the partnering and collaboration between different parties. Eriksson (2008) already proposed cooperation-based projects as a more efficient form of collaboration as opposed to competition-based cooperation. Moreover, Thompson and Sanders (1998) claim that closer collaboration improves trust, increases the sharing of information and creates continuous improvement. Next to that, as already mentioned in the introduction, closer collaboration enables sustainable innovation as well. For example, the bundling of projects can increase the impact of innovative techniques like modular construction (Bertram et al., 2019). With the contractual portfolio approach, parties are encouraged to engage in longer-term collaborations, accompanied with abovementioned benefits.

By implementing the CPA, societal goals are not automatically reached. It is not inconceivable that a CPA is implemented in such a way that it does not contribute to innovation, efficiency, standardisation or any other thinkable goal for that matter. For example, in the UK construction sector, around 50% of the parties in a framework agreement do not adhere to the terms that are stated in the contract (Caldwell et al., 2005), leading to the malfunctioning

of many framework agreements. Therefore, in order to actually reach these goals, the approach has to be implemented in a certain way. Caldwell et al. (2005) for example emphasise that well-functioning framework agreements require on-going commitment as well as creative and innovative leadership to make them work. With this research, insight into such aspects is gained, which provides relevant stakeholders with information that helps them to implement the CPA in such a way that it actually contributes to their objectives. This is especially relevant since the way in which projects can or should be bundled, largely depends on the objectives a client pursues (de Bouwcampus, n.d.b). Therefore, an analysis of the objectives is essential to determine how CPA can be structured and implemented effectively.

### 1.3.2. Academical

This subsection provides the academical relevance of this research, by first describing the relevance for the current body of knowledge and then explaining the added value for the field of Construction Management & Engineering.

#### *For the current body of knowledge*

The term portfolio approach has been in use in academic literature for a long time, starting around the 1960s as a term primarily used in the financial sector (Michaelsen & Goshay, 1967; Jeffers & Kwon, 1969). Since the 1990s, even though it being very sporadically, it is also used in the context of the construction sector. For instance, Veshosky (1994) proposes the portfolio approach as a way to strategically manage an engineering firm. It is herewith important to note that it is mostly used in an internal way, meaning that the aim is to optimise processes within a company. With this, an attempt is made to shift from a project-to-project, short-term view, to an overarching, longer-term focus. Even though this goal is similar to what the current portfolio approach is often aimed at, the fact that it is an internal approach makes it contrasting in essence. The portfolio approach in general, and especially in its current form as an external method between different parties, has only gained relevance in the last three years and has not been researched thoroughly yet.

More specifically, due to the portfolio approach being quite novel in the field of research, an assessment of the definition of CPA has not been done yet. The term gained relevance in recent years, mainly because RWS uses it in its procurement strategies. In their guidebook, even though not very explicitly, they assign their own definition to it (Rijkswaterstaat, 2021a, p. 6). However, this definition is reasoned from the viewpoint of one organisation. For other forms of collaboration in the construction sector, there is mostly plenty of literature available that describes some form of definition. For example, Laryea and Watermeyer (2016) describe Early Contractor Involvement as “the involvement of the contractor in design development to obtain the benefits of a contractor’s expertise as a builder”. Moreover, for framework agreements, which is a concept that is closely related to the CPA, a definition is even prescribed by the European Union, being; “An agreement between one or more contracting authorities and one or more economic operators, the purpose of which is to establish the terms governing contracts to be awarded during a given period, in particular with regard to price, and where appropriate, the quality envisaged.” (Tennant & Fernie, 2012). For CPA, a formulation of the definition has not been done in an academical way, which raises the question, how exactly does a CPA differ from similar approaches? As part of better understanding the CPA, an important addition to scientific knowledge of this research is to exactly determine what does and what does not fall within the definition of CPA. This includes assessing how other approaches overlap, fall within or surpass the CPA.

Then, the same line of reasoning is valid for the objectives that can be pursued with the CPA. RWS formulated its own objectives in relation to the market (Rijkswaterstaat, 2021a, p. 9). It mentions closer collaboration, innovation, cost reduction and uniformity as possible objectives for a CPA. These objectives are however reasoned from the viewpoint of a single organisation

as well and do not provide a comprehensive overview of the objectives a CPA can be aimed at. For example, even though this research is performed in another sector, Davies et al. (2007) state that organisations need standardisation to be successful, which can only be realised by providing solutions over multiple projects. Moreover, contractors can reduce development costs because of aspects like economies of scale, which is also something that is linked to bundling in a sense, but which has not directly been analysed in a CPA context (Trautmann et al., 2009). The same goes for limiting the duration of a project, of which Xiong et al. (2017) state that it can be reached through bundling. Besides this, the bundling of projects can enhance modularity, since factory costs can be spread over multiple projects (Bertram, 2019). Moreover, innovation as an objective could be specified better. de Vries et al. (2015) for example defined multiple public sector goals that can be reached with innovation, making innovation more of a means to reach certain more specific goals. So, there is a dispersed body of knowledge on different objectives, of which the degree of relatedness to the CPA differs per objective. This research aims at providing an overview of objectives that can be related to the CPA.

Finally, even though RWS constructed an extensive document that should provide a pathway in using the CPA, the different ways in which the CPA can be structured has not been researched very thoroughly. There are a few academical sources that touched upon elements of structuring a portfolio approach in a general sense (Hope & Moehler, 2014; Kaczorowska et al., 2019), but they do not give guidance on how to structure a CPA in the context of the infrastructure sector. Moreover, literature on similar terms like project bundling and framework agreements often describe the potential benefits of these approaches, but do not describe how they can be structured (Miralinaghi, et al., 2021; Williams et al., 2013). The importance of gaining knowledge on the ways in which CPAs can be designed is amplified by Caldwell et al. (2005), who state that a framework agreement, which can be seen as a legal form of CPA, often has pitfalls that should be avoided. Furthermore, Aritua et al. (2009) underline that a multi-project perspective brings about a certain form of complexity that differs from single-project situation, which requires a different type of management. This research therefore specifically investigates choice options considering this multi-project perspective, and provides knowledge on how a CPA can be implemented without abovementioned pitfalls.

#### *For Construction Management & Engineering*

This research aligns seamlessly with the curriculum of Construction Management & Engineering (CME). According to the TU Delft website, CME addresses the growing need for reform in the construction industry focussing on aspects such as transparency, innovation and sustainability, which can all be seen as benefits of the contractual portfolio approach as well (TU Delft, n.d.). Moreover, the website presents contracting and procurement as one of the essential parts of the curriculum. This is substantiated by the fact that a complete course, Forms of Collaboration in Civil Engineering, is devoted to this subject. In this course, theoretical knowledge is provided on collaboration in the construction sector that is essential for conducting this research. Furthermore, the 2-phase approach, another strategy aimed at creating a healthier construction sector, forms an important subject in this course. Even though CPA may not be explicitly covered in this course, it would fit perfectly. In fact, the absence of the CPA in this course might even indicate a lack of knowledge regarding this topic, and can therefore be seen as an extra indicator for the relevance of this research.

Moreover, in line with the website, CME presents itself as a study that tackles organisational challenges in a technical context. The subject of this study can pre-eminently be seen as an organisational challenge, since procurement and contracting are organisational matters, in the technical context of construction projects.

## 1.4. Set-up

This section presents the research questions and goal and draws the boundaries of the study in the form of a scope definition.

### 1.4.1. Research questions

On the basis of the previously described research gap, research questions are formulated. Firstly, the main question is presented. This functions as the central focus throughout the entire research, and forms the end-point for the conclusion. It does this by providing a link between objectives of clients regarding the CPA on the one hand, and choice options within the CPA on the other. The main research question is the following:

*MQ: How can a client involved in a contractual portfolio approach effectively align its decisions with the objectives it set on a portfolio level?*

An answer to the main question cannot be found in one step. Instead, multiple sub-questions form intermediate steps that are needed to ultimately find an answer to the main question. For the definition of the sub-questions, it is important to note that, as mentioned previously, there are several ways in which a portfolio approach can be defined. Next to that, there are several other approaches or terms that are in some way related to the CPA, and for which this relation is not yet completely clear. Therefore, to answer the main question, it is firstly important to know how exactly the portfolio approach is defined and how it overlaps with or differs from similar approaches. This brings us to the first sub-question:

*SQ1: What characterises a contractual portfolio approach compared to similar approaches?*

By answering this sub-question, a clear definition of the CPA is constructed and the approach is positioned compared to similar approaches. This provides a foundation on which the remaining part of the research can build further.

Then, an inventory of the objectives clients pursue when using the contractual portfolio approach is made. This is a merely descriptive analysis of what clients are currently aiming for. The second sub-question is the following:

*SQ2: What are the objectives pursued by clients when adopting the contractual portfolio approach?*

This sub-question gives a broad and extensive overview of objectives that are associated with the implementation of a CPA. This step not only entails providing a list of objectives, but also determining how these objectives are related to other objectives and factors in the system, in order to understand the dynamic of these objectives.

Clients have objectives on different levels. On an organisational level, objectives like (financial) stability, being future-proof and customer satisfaction typically play a role. On the level of a specific work, clients pursue objectives like realising a fit-for-purpose element. This research focusses on objectives on the portfolio level, in between the organisational level and the work level, as depicted in figure 1-1.

Figure 1-1 - Levels of objectives (made by author)



After formulating a definition and determining objectives, the next step is to analyse the different choice options clients have. With the analysis of the objectives on the one hand, and the options on the other, a complete overview of the CPA is attained. This step is accompanied by the following sub-question:

*SQ3: What are the available options for clients within the context of the contractual portfolio approach?*

#### 1.4.2. Goal

Summarising, the goal that this research aims at is:

*To gain insight into the options available to clients within the context of the contractual portfolio approach and to investigate how the selection of these options can contribute to the objectives of the involved clients.*

#### 1.4.3. Scope definition

This subsection provides the demarcation of this research. It gives an overview of what will and of what will not be part of the study on the basis of four aspects. By setting these boundaries, enough depth can be reached without the study becoming too extensive in its coverage.

##### *Definition and similar approaches*

There are various examples of situations where some kind of portfolio approach is used that does not fall within the definition of CPA as it is used in this research. For example, in the ICT sector in the USA, a portfolio approach is used as a way to manage investments (Kersten & Verhoef, 2003). The other way around, it is conceivable that there are situations in which a certain approach is chosen that does adhere to the definition in this study, without it being referred to as a portfolio approach. It is important to note that the former situation will not, whereas the latter will be examined in this research.

##### *Specific sub-sector*

Within the construction sector, different sub-sectors can be identified. Which sector is chosen for the application of the CPA, has an influence on how the approach should be structured. For example, on the one hand of the spectrum, there are very small projects concerning private housing where private parties act as clients. In this context, the portfolio approach is a well-known way of tendering (duSaar, 2022). On the other hand, there are large infrastructure projects which are essentially different in multiple ways. A typology that is often

used, is the division of the sector into three sub-sectors; housing, utility and infrastructure or earth, road and waterworks (Dutch: GWW). This research will focus on the latter. The most important difference between the 'GWW' sector and the other two, is that the role of client in this sub-sector is in essence always fulfilled by a public party. This research therefore only looks at situations where there is an interaction between public and private parties. 'Business to business' situations are not taken into consideration. Moreover, only the infrastructure sector in the Netherlands is assessed, sectors in other countries with other dynamics are not taken into account.

### *Effectiveness*

It is essential to clarify that the aim of this research is not to assess the effectiveness of the contractual portfolio approach in general. This study does not aim to provide an answer to the question whether applying the approach is advantageous. While certain aspects that indicate the usefulness of this approach are considered in the sections covering the context and societal relevance, it is important to acknowledge conceivable downsides of the approach as well. These might include the fact that CPA tends to limit competition and accessibility for smaller parties in the sector. However, weighing up benefits against downsides would require a complete separate study. This research is limited to defining how the CPA should be structured, while assuming that it is a beneficial approach.

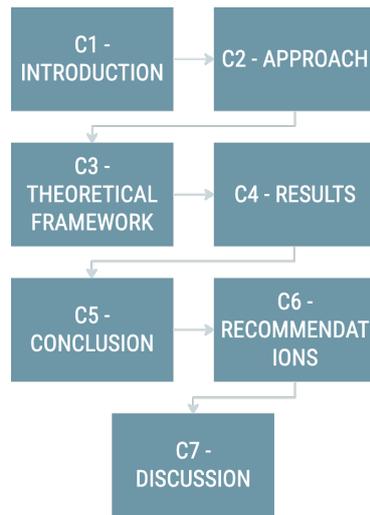
### *Legal aspects*

The core of this research is an organisational question in a technical context. However, the CPA is inherently comprised of legal aspects as well. EU procurement law obliges governmental bodies to procure by means of a prescribed European procurement process (Aanbestedingswet 2012). There are however exceptions to this, for example in case of framework agreements or repetitive works (art. 2.25 Aanbestedingswet 2012). So, despite the legality of a specific application of the CPA being determined on a situational basis, it is important to investigate how a CPA can be structured in such a way that its legal validity is likely. In this research, these legal aspects will be included as the boundaries within which a CPA can be structured, without aiming at finding an unambiguous answer to the question in which situation the CPA is allowed.

## 1.5. Report outline

This introductory chapter is concluded with a short description of the outline of this report. After the introduction, the research approach will be described in chapter two. This approach consists of some methodological steps, together with certain general ways of working that are used throughout the research. Then, chapter three will give the academical theory that forms the basis of the rest of this research, which is presented in a theoretical framework. After this, chapter four will present the main findings, after which chapter five will conclude on the basis of these findings. Chapter six presents the recommendations addressed to clients in the civil engineering sector, accompanied by a decision guideline. This report concludes with a description of the most important limitations and recommendations for further research. Figure 1-2 gives an overview of this outline.

Figure 1-2 - Report outline (made by author)



# 2

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## RESEARCH APPROACH

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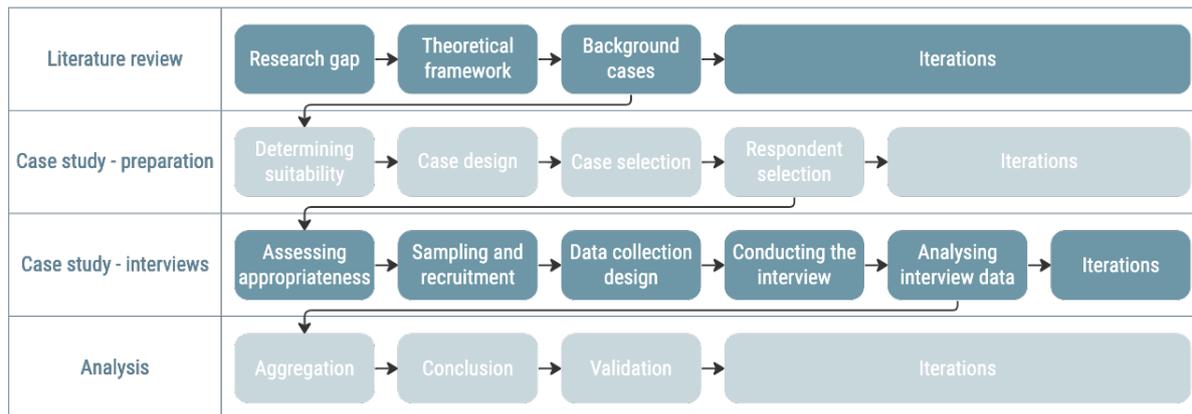
In this chapter, the research approach is described, comprising of a research design that is followed to complete the research. Next to that, a description is given of the way in which data is gathered through a literature review, and the scrum way of working with iterative steps is underlined.

This research has a qualitative character, which means that non-numerical data is gathered and results and conclusions are presented in a descriptive manner. As Pyett (2003) describes, the goal in this kind of research is not to measure, but rather to understand and describe a situation.

## 2.1. Research design

For this research, specific methodological steps are undertaken. These steps are summarised in a research design. Figure 2-1 provides an overview of this. As depicted in this figure, at a certain point in every 'lane', the step is made towards the next one. However, this does not imply that the activity in this lane comes to a halt. Instead, iterative steps are carried out in each lane throughout the entire research process. For instance, rather than concluding the literature review as soon as the theoretical framework is established and background information on the cases is collected, it is extended throughout the research in order to refine and reflect on results.

Figure 2-1 - Research design (made by author using Miro)



### 2.1.1. Literature review

This study starts with a literature review, which is extended throughout the majority of the research. This literature review is conducted to define the relevance and context of the subject and to determine the research gap. Then, literature is used within the case studies, to identify cases, formulate research questions and to create a content-based starting point for the interviews. Simultaneously, with literature, an answer is sought to the research questions, meaning that definitions, objectives and options of the CPA are reviewed.

### 2.1.2. Case study

In addition to the literature review, a case study research is conducted. This case study aims at deriving information from certain specific cases, that can be generalised in order to draw case-transcending conclusions.

#### *Determining the suitability*

Swanborn (2010) identified conditions which make a case study a suitable technique for a certain situation. Three of these directly apply to this situation, being:

- > Impossibility to isolate phenomena

There are several factors influencing choices and outcomes in projects and programmes in the civil engineering sector. The effectiveness of a particular approach may depend on the way it is implemented, but might as well be a result of external factors. Therefore, it is more useful to assess a limited amount of cases than to perform more quantitative analysis methods like regression analysis. This is also underlined by Bromley (1986), who states that it is impossible to isolate a case from its context, which makes it inevitable to assess the context as well. This research also aims on doing this, by not exclusively assessing the CPA itself, but including other factors that play a role in the system from a broader perspective.

> Rarity of the phenomenon

There is only a limited number of occasions available in which a CPA is used, making it unfeasible to conduct statistical analysis due to the limited amount of data points available. A case study, which assesses a limited amount of situations in a more qualitative manner, is therefore more suitable for this research.

> Intention to combine research and action

This research is an attempt to make a contribution to the academic body of knowledge. However, in an ideal scenario, this knowledge is also practically applicable for stakeholders in the civil engineering sector. Hence, there is a clear intention to combine research with concrete action. This intention makes a case study especially interesting, since it is a method that inherently combines theory with practise.

These three aspects combined form the rationale for the decision to conduct a case study in this research. Because of these aspects, a case study is a logical approach in this situation.

### *Designing the case*

Within this case study, the steps as described by Yin (2012) are followed to design the case. The initial step involves defining the case, which in this research is a situation in the civil engineering sector where a public client implements a contractual portfolio approach as a way to procure multiple works in a bundled manner. After this, the type of case study is determined. This can be either holistic or embedded, and either a single-case or multiple-case situation. For this research, an holistic multiple-case study is conducted. Holistic because the cases are assessed from a system perspective, and multiple-case because data from a multiple-case study can provide greater confidence in the findings (Yin, 2012, p. 7). The number of cases that is assessed, is determined on the basis of two factors, being depth and variety. Reasoning from variety, one could say that 'the more, the better', since more cases provide a more varied view on the subject (Swanborn, 2010). Specifically for this research, this reasoning would mean having cases with different objectives, different clients and different scopes. However, assessing a large amount of cases limits the possibility to go into depth on the cases that are assessed. Therefore, six cases are analysed in this case study, a number that forms a balance between variety and depth. The selection and description of these cases can be found back in appendix A. As a last designing step, the decision is made whether or not to incorporate theory in the case study. In this research, theory is used by means of a theoretical framework that forms the foundation of the case study. Including theory is crucial in order to take control during the case study and the interviews. Without the use of theory, it is difficult to guide the case study and the interviews conducted within it. Moreover, theory is used as a basis for the coding, which will be described in the next subsection.

#### 2.1.3. In-depth semi-structured interviews

Once the suitability of the method is determined and the case is defined, data collection starts by interviewing involved experts. For each case, experts with interesting roles in the contractual portfolio approach are questioned regarding their experience with the approach in their case. These roles can be programme or project manager, purchasing strategist or advisor, contract manager or similar titles, depending on the terminology used by the organisation that acts as client in the case. Experts in these roles are interviewed in an in-depth and semi-structured manner. In-depth indicates that a certain depth is reached by having an open conversation. As Legard et al. (2003) explain it, in-depth interviews should feel like a natural conversation. However, some structure is required to gather the information that is needed for the research. Therefore, in-depth semi-structured interviews are the best fitting method for this study. This line of reasoning is also underlined by Adeoye-Olatunde and Olenik (2021) who state that this form of interviewing provides structure while at the same time giving autonomy to explore what comes up during the interview. Moreover, they add that this form is an important method within

qualitative research. The in-depth and open way of interviewing fits well to the character of this research, since it is an explorative study of a relatively new approach, with a limited amount of respondents who possess a lot of knowledge on the topic (Hancock, 2021).

These in-depth interviews are conducted on the basis of seven steps described by Adeoye-Olatunde and Olenik (2021), of which the first five are;

- > Assessing appropriateness of this interview technique

This is done by determining characteristics of this research that fit to this technique.

- > Sampling and recruitment

This research uses 'purposive sampling', which entails the selection of participants based on certain criteria. In research of quantitative nature, random sampling would be better. However, this research does not strive for statistical generalisability, so random sampling is not necessary.

- > Data collection design

For the data collection design, an interview guide with topics and questions is designed. The complete guide can be found in appendix B. However, this guide cannot predict every situation. Therefore, it is important to leave room to deviate from this guide. As Kallio et al. (2016) formulate it, "the interview guide offers a focused structure for the discussion during the interviews but should not be followed strictly". The goal is to use the interview guide in such a way that it directs the conversation to answers to the research questions, while leaving space for further questioning and new concepts that emerge (Dearnley, 2005; Krauss et al., 2009).

- > Conducting the interview

Conducting the interviews means effectively collecting the data. For this, it is important to adhere to general best practises of interviewing. As highlighted by Legard et al. (2003), it is essential to avoid leading questions that may influence the respondent's answer. In this light, it is also important to deal with gathered data from the literature in a careful way. This means starting with an open question without revealing prior knowledge, and from that point gradually incorporating knowledge from the literature in order to refine the specificity of the questions.

- > Data analysis

After conducting the interviews, the data is analysed. This is done by juxtaposing the theoretical framework to the gathered interview data. Structure is given to the data with a method that is called 'coding'. With this approach, codes are constructed on the basis of the interview data and the theoretical framework. The codes that are used in this research on the basis of the theory, can be found back in the 'codebook' in appendix C. Then, these codes in the form of textual labels are assigned to interesting quotes in the interview data (Flick et al., 2004). Such a textual label could for example be a predefined objective, which can be assigned to a quote in which a respondent refers to this objective.

#### 2.1.4. Aggregating, synthesising, concluding

As a next phase, all the information derived from the literature review, case study and interviews has to be combined and synthesised in order to answer the research questions. This phase includes the last two steps as described by Adeoye-Olatunde and Olenik (2021), which are drawing conclusions and reporting results.

#### 2.1.5. Generalisability

To enable aggregation, synthesising and drawing general conclusions, it is important to prove the generalisability of the results in the case study. This is done on the basis of two aspects (Gerring, 2016; Yin, 2017).

#### > Selection of cases

Two aspects safeguard the generalisability of this research from a case selection perspective. Firstly, six cases are assessed, which is a relatively large part of the total amount of CPA cases available. Even though this research does not claim to have identified every case in which a CPA is implemented, a thorough inventory of cases is conducted out of which only approximately ten cases were derived. Secondly, in the selection of the cases, variety was used as an important criterion. Since the set of cases is varied in scopes, clients, objectives and legal forms, it can safely be concluded that it covers most of the total area of CPA cases.

#### > Theoretical foundation

The case study is conducted on the basis of a theoretical framework that is derived from literature. By connecting the data derived from the case study to established academical theory, it can be demonstrated that the findings apply to a broader range of situations.

#### 2.1.6. Expert validation

As a last step, the data from the literature review and the case-studies will be validated through expert judgement. In this validation round, a group of experts will be gathered who are knowledgeable about the topic of CPA and are therefore probably involved in some case where a CPA is implemented. However, they will not be involved in the light of a specific case. By proposing the results and conclusions that are derived from the research to them and asking whether they think the outcomes are likely, it can be assessed whether the results match with reality. This procedure indicates the degree to which the outcomes are generalisable as well.

### 2.2. Data gathering through a literature review

The data gathering method within the literature review is a determining factor for the way in which the research is conducted, and therefore requires careful attention. It involves two main aspects. On the one hand, generally applicable theories will be researched and applied to the situation at hand. An example of this could be an article in an academical paper which explains the fact that the bundling of projects increases its efficiency. These kind of articles will be found by entering relevant search terms in search engines like Google Scholar and Scopus. Next to that, Connected Papers will be used to find similar sources that are in some way associated with the relevant literature that is already found. On the other side, specific literature on the CPA in its current form is needed as well. Since this approach is relatively new, the existing body of literature is limited. Therefore, in this part of the research, newspapers like Cobouw or figure-focused sources like CBS or EIB will be the main source of information. Moreover, part of the information will be derived from parties like Rijkswaterstaat or Bouwend Nederland. However, these sources will always be used while keeping in mind that these parties reason from their own perspective and might not be a hundred percent objective. Therefore, the aim is to combine information from these sources with more 'neutral' sources.

### 2.3. Scrum method with iterations

Throughout the whole research process, a way of working is used that is based on the scrum way of working as described by Srivastava et al. (2017). This is a way of working that finds its origin in software engineering, but is used in many sectors in recent years. It entails working towards a first version of an end-product relatively quickly, and then improving this in multiple steps. This creates an iterative instead of linear process which stimulates learning and improving. Iterative loops are created on multiple levels. Within a research step, for example by describing a preliminary version of results, then looking at the interview output again and revising these results, but also throughout multiple steps, for example by juxtaposing interview results with the output of the literature review and refining the literature review on the basis of this. Moreover, these loops are not only created as an internal method for the researcher, but also as a way to communicate with the graduation committee and other stakeholders. Over and

over again, a preliminary version is presented to them, and their feedback is used to make a step in improving the end result.

# 3

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## THEORETICAL FRAMEWORK

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In this chapter, a theoretical framework is presented. This provides a theoretical foundation for the remaining analysis that is conducted in this research. It functions as a starting point for the case study, in which prior knowledge is important for the structuring and coding of the interview transcripts (Flick, 2004). Next to that, this information can be used to guide the interview and ask more specific questions, without losing the open character of the semi-structured interview.

### 3.1. Definition and positioning of CPA

In this research, a definition of the contractual portfolio approach is determined by analysing academical literature in combination with sources that demonstrate its usage in the market. Specific parts of this definition describe the boundaries of what does and what does not fall within the term CPA. Moreover, the CPA is compared to and positioned against other approaches. With this, a picture is painted of the essential distinctions and similarities between CPA and these approaches.

#### 3.1.1. Formulation & decomposition

This paragraph kicks off the chapter with the formulation of the definition in one sentence, which is:

*The bundling of a logical set of similar works into one initial tender.*

By decomposing this definition, multiple important aspects can be extracted from it. Firstly, the term 'bundling' is important. Bundling, according to the dictionary, means combining, or making a package. This is in line with the essence of the CPA, which is combining or making a package out of works. Moreover, the word 'bundling' is used extensively in literature about procurement and contracting in the construction sector. For example, Estache and Limi (2009), Nerenz (2007) and Xiong et al. (2017) all refer to the act of combining multiple works into one tender or contract as 'bundling'. Furthermore, Frank and Merna (2003) even create a direct link between the terms bundling and portfolio by stating that "bundled projects can be considered portfolios of projects". It is worth pointing out here that the term 'grouping' could have been used as well, since it is used as a synonym in this context (Xiong et al., 2017).

Additionally, it can be noted that the term bundling is used in the construction sector with various connotations. For example, integrated contracts, like UAV-IC, in which more responsibility is transferred to market parties, is sometimes referred to as 'bundled' as well (Carpintero & Petersen, 2015). It is important to underline that bundling in the context of a CPA only applies to the grouping of multiple works.

The second part of the definition involves 'a logical set of similar works'. This entails including a set of works with a certain form of similarity in the CPA. Only with similar works, the different objectives that clients have can be reached. Van den Hurk and Verhoest (2014) state that bundling procurement is "jointly procuring a number of similar projects". This notion of similarity can be found in multiple studies. According to Qiao et al. (2018), project similarity is an important consideration in project bundling, which can be similarity in required resources and material, but could for example also refer to proximity (Qiao et al., 2019). This is also underlined by McCarthy, Mensching & Horgan (2011), who found that in most cases where projects were grouped, they had similar work types or were located near one another.

Next to this, the term 'works' on its own is important as well. In the past, portfolio approaches have been used for the bundling of services (Veshosky, 1994). However, this is essentially different from works, since the legal situation is different. The Aw 2012 makes a distinction between works and services, which for example has an impact on the threshold sum for which an EU procurement scheme has to be followed (art. 2.21 Aanbestedingswet 2012).

Then, the phrase 'into one initial tender' is a crucial aspect to highlight, as it clarifies that the CPA is a form of tendering as opposed to a contracting form which the name might suggest. Within a CPA, clients can choose different kinds of contract forms. A CPA can for example be combined with a UAC or a NEC, or other project delivery methods like an alliance. Moreover, 'one initial tender' means that the portfolio as a whole, so in other words the combination of works, is tendered as a first step of the CPA. After this first initial tender, the secondary works

can be awarded in a variety of ways. When multiple contractors enter in the portfolio, the secondary works can for example be tendered with a mini competition, making the word 'initial' essential to leave room for more tenders to be applied in the portfolio itself.

The term 'tender' illuminates that a CPA is different from a 'portfolio approach' in general. A portfolio approach can be defined as multiple projects managed by one coordinating team. This is an approach that can be implemented within an organisation to manage multiple projects, but does not imply any form of collaboration with other parties. An essential part of the CPA, is the fact that it includes a client-contractor relation.

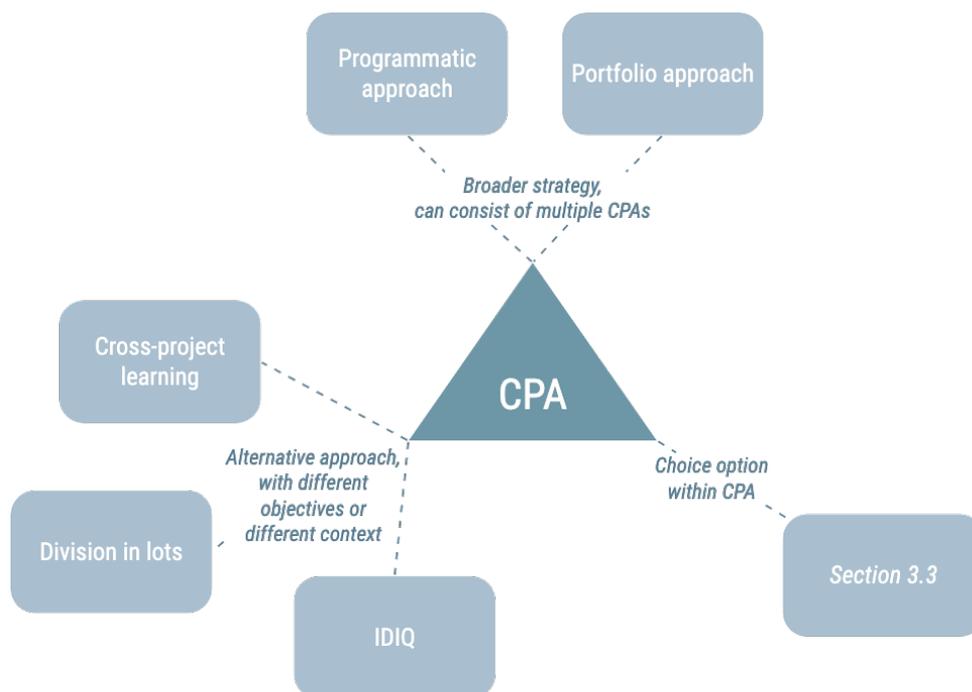
### 3.1.2. Similar approaches

To further refine the definition of CPA, the approach is positioned in relation to other related concepts. These concepts can be seen as approaches that can form a substitute of CPA in specific situations and contexts. However, these approaches might be broader than CPA, which creates the opportunity to implement multiple CPAs within these approaches, or more specific than CPA, making them choice options within a CPA. In addition, they might only be used in a different context or with other objectives in mind.

Assessing all these concepts and positioning CPA in relation to them, gives an idea of how CPA is related to other approaches, how it might overlap with certain ones and on which aspects CPA is essentially distinctive. By doing so, the 'boundaries' between CPA and other approaches can be drawn.

The approaches discussed in this research do not form an exhaustive overview. There may be more approaches with similarities to the CPA that are not covered. However, these are the ones that were found in literature and that form a useful insight into the boundaries of the CPA. In figure 3-1, the relation between CPA and these concepts is visualised. There are three layers of relations. Some approaches are broader than CPA, some are considered alternatives and some are choice options within a CPA. Since choice options are further defined in a later section, this section focusses on the first two categories.

Figure 3-1 - Similar approaches (made by author using Miro)



### *Programmatic approach*

The programmatic approach is closely related to the CPA, because of its overlapping character and objectives. With both approaches, some kind of overarching view is created over multiple projects. Where for the programmatic approach projects are bundled in a programme, CPA bundles projects in a portfolio. For the programmatic approach, the following definition is derived from literature (Ferns, 1991; Rayner & Reiss, 2012):

*Managing a group of projects in a coordinated manner.*

The fundamental difference is that the programmatic approach only prescribes that an organisation assesses its projects from a programmatic level, with which for example resources can be allocated in a better way and longer-term objectives can be reached more adequately. While the CPA also encompasses these aspects, it takes an additional step. With CPA, projects are actually combined into a single tender, which is not a requirement for programmes. Programmes are in this sense broader, and can comprise of multiple CPA's. For example, the portfolio 'Tunnel Renovations Zuid-Holland' (Dutch: Tunnelrenovaties Zuid-Holland), is part of the programme 'Renovation & Replacement' (Dutch: Vervanging en Renovatie) (Rijkswaterstaat, 2023). The programmatic approach is therefore a broader strategy than the CPA with similar intentions.

### *Portfolio approach*

The portfolio approach has a similar relation with the CPA as the programmatic approach. Even though it is used in various context where the definitions on some aspects differ, it inherently holds the premise of taking a viewpoint over multiple individual elements. As mentioned in the introductory chapter, the portfolio approach is considered as a way to strategically manage multiple elements combined (Michaelsen & Goshay, 1967; Jeffers & Kwon, 1969; Veshosky, 1994). As with the programmatic approach, this fits well to the line of reasoning of a CPA, meaning that a portfolio approach can be a starting point from which the choice for a CPA can be made as well.

### *Cross-project learning*

Promoting a learning curve across projects is one of the main drivers for the implementation of a CPA. However, a CPA is not the only answer to the notion that the project-to-project learning capacity in the construction sector is limited. A lot of research has been conducted into this 'cross-project learning', and a variety of strategies have been presented on how to enhance this (Julian, 2008; Newell, 2004). Comparing these approaches with CPA, it can be concluded that the CPA is a more comprehensive approach that can be implemented with multiple objectives in mind, whereas cross-project learning methods are just focused on improving the learning capacity within projects. Cross-project learning methods can be implemented within, or together with, a CPA, but can also be used on their own.

### *Division in lots*

Division in lots is a concept that in some way applies the same reasoning as CPA, but in a reverse order. The base idea of this concept is that a client procures all the available work in one contract. However, it can also be more beneficial to split the work in smaller lots. Grimm et al. (2006) assess the desirability of this division on the basis of the level of competition. Moreover, Estache and Limi (2008) state that a certain bundling or division of lots influences the tender costs.

### *IDIQ*

An IDIQ contract, or Indefinite Delivery, Indefinite Quantity contract, is an approach that the US federal government uses in sectors like road construction (Scott Stanford & Molenaar, 2020). With IDIQ, a client and a contractor commit themselves to a longer-term relation, where multiple

works are done by the contractor. The essence of IDIQ is that the set of works that have to be performed is not yet clearly defined upfront. The parties start their partnership without knowing exactly what work has to be done. This forms the difference to CPA. With every legal form of CPA, the work that lays ahead has to be specified in some way.

### 3.2. Objectives

A contractual portfolio approach can be applied with various objectives in mind. This part of the literature study gives an overview of objectives derived from literature. Part of this overlaps with the societal relevance, since both describe the benefits of CPA.

One primary objective is cost reduction. Qiao et al. (2018) state that the bundling of projects decreases project costs because of economies of scale. They specifically mention bridge projects as an example of where this effect is even larger. However, this outcome applies to every type of construction project, which is confirmed by Miralinaghi (2021), who also states that bundling can lead to a decrease in construction costs. Trautmann et al. (2009) considers economies of scale as an important driver for the reduction of development costs, which results in a more beneficial tender offer. Moreover, this goal of cost reduction does not have to be limited to the execution of a project. Procurement costs can be reduced as well, since multiple procurement procedures are substituted by one, reducing the burden on public parties to review tender proposals (Scott et al., 2020). This is also confirmed by Rijkswaterstaat (2021), which mentions transaction costs reduction as a goal for the implementation of CPA. A third type of costs that can be reduced by bundling projects, is the cost of failure. According to Rose et al. (2002), 39% of project failures were due to unsuccessful partnering. They propose establishing personal relationships between clients and contractors and providing training as potential solutions for these failures. In a CPA, client-contractor relations are extended over a longer period, which makes these kind of investments more feasible. Rijkswaterstaat (2021) name the reduction of costs of failure as a goal for the implementation of CPA as well. All of this makes cost reduction an important objective in a CPA context.

Then, there are multiple sources that dive deeper into the aspect of resource use and efficiency. According to Qiao et al. (2018), bundling can enhance efficiency and can lead to reduced resources. Moreover, McCarthy (2011) states that this does not only apply to materials, but to staff as well. Furthermore, this efficiency also has a beneficial influence on construction time, which means a reduction of the unavailability of an element (Qiao et al., 2018). Xiong et al. (2017) drew a similar conclusion, stating that with bundling, multiple projects can be executed efficiently after one another, which results in a reduction of project duration. Rijkswaterstaat (2021) links efficiency to capacity, by including an increased production capacity as one of its goals.

Furthermore, in a general sense, working together for a longer time improves the partnering and collaboration between different parties. Eriksson (2008) already proposed cooperation-based projects as a more efficient form of collaboration as opposed to competition-based cooperation. Moreover, Thompson and Sanders (1998) claim that closer collaboration improves trust, increases the sharing of information and creates continuous improvement. Next to that, as already mentioned in the introduction, closer collaboration enables sustainable innovation as well. For example, the bundling of projects can increase the impact of innovative techniques like modular construction (Bertram et al., 2019). Innovation is a goal that is found in practice very often. Rijkswaterstaat (2021), the province of Noord-Holland (n.d.), waterboard WDODelta (2022) and the municipality of Amsterdam (2020) all mention innovation as a driver for performing some kind of bundling of works, making it one of the main objectives for the CPA.

Then, standardisation and uniformity could be objectives on the basis of which a CPA is implemented. Rijkswaterstaat (2021) mentions uniformity in execution as a goal, and multiple sources state that longer-term agreements are needed for standardisation of products (Chakkol et al., 2018; Gadde & Dubois, 2010). Even though this is not directly linked to the bundling of works, it can be linked indirectly since McKinsey and Rijkswaterstaat (2019) associate CPA with longer-term collaboration.

From the contractor's perspective, a CPA could be interesting from a risk management perspective. Vegara & Boyer (1977) link risk management to the portfolio theory, meaning that contractors can view their projects from a portfolio perspective and manage risk better from this view. According to Rijkswaterstaat (2021), the reduction of risks over multiple works is a goal for the CPA as well.

### 3.3. Choice options

This section presents the outcome of the literature review regarding the choice options for clients within a CPA.

#### 3.3.1. Selection and award criteria initial tender

When a CPA is implemented, the portfolio will be procured with an initial tender. For this, the most suitable contractor with the best tender proposal has to be selected. This is mostly done on the basis of two distinctive types of criteria, selection and award criteria (Dutch: selectie- en gunningscriteria) (Aanbestedingswet 2012).

Selection criteria focus on assessing the suitability of the contractor itself, taking into account its past performances and experience with similar tasks. Multiple sources in literature define this process as one of the most important steps in project management (Sing & Tiong, 2005; Zavadskas, 2008). Moreover, Watt et al. (2010) state that contractor selection does not only influence project success, but also the achievement of specific objectives. Since the CPA is often implemented to reach certain specific objectives, it is important to take this into account.

Award criteria do not aim at selecting the contractor, but instead focus on the tender proposal. These can be used to reach specific policy objectives like sustainability or innovation (Grandia & Meehan, 2017).

Both selection and award criteria are pivotal for project success and reaching certain goals within projects (El-Khalek et al., 2019). Moreover, specifically for the contractual portfolio approach, the criteria have to fit to the longer-term portfolio objectives with which the client enters the procurement process. Since the Aanbestedingswet (2012) prescribes an explanation of the reason for bundling multiple works, having a clear view on the connection between the criteria and the portfolio can be an important legal factor as well.

#### 3.3.2. Performance management

Robinson et al. (2005) state that performance management holds significant importance in the construction industry. Especially on a programme level, where multiple projects are considered collectively, the importance of performance management is emphasised (Heinrick & Marschke, 2010). CPA takes into account the broader perspective as well, which indicates that performance management is also important for this approach. Moreover, Molleman and Timmerman (2003) mention that when innovation and learning become more important, the role of performance management changes. This effect indicates that performance management depends on the objectives that clients have, making it an important variable within the CPA.

The importance of performance management is also confirmed by RWS, which considers performance management as an almost inseparable part of CPA, indicating the significance of this topic in the market (Rijkswaterstaat, 2021). Although this research may not explicitly consider performance management as a standard component of CPA, it is considered as a choice option of which clients can decide whether it should be implemented or not.

### 3.3.3. Legal structure

A CPA can be performed by means of multiple legal structures. From the Dutch procurement law, three legal structures that enable a contracting authority to bundle works can be derived (aanbestedingswet 2012). These are:

- > Framework agreement
- > Repeat order
- > Revision clause

In section 4 of this chapter, a more comprehensive analysis of the legal framework within which a CPA can be positioned is performed. For this chapter, it is important to note that every structure has its own benefits and limitations, making it an important choice within the CPA.

### 3.3.4. Collaborative aspects

Since the 1990s, collaboration in the construction industry has gained relevance. This development started with researchers like Latham (1994), who looked at teamwork and partnering. Terms like collaboration, partnering and teamwork are often used interchangeably, but The Merriam-Webster Dictionary (2004) defined collaboration as “the act of working together”. In this research, aspects that determine how this act of working together is done, are considered in this choice option. These can for example relate to teambuilding or managing interfaces (Bresnen & Marshall, 2000). It can also relate to the level of involvement of the client, since an appropriate level of client involvement is important for project management (Bower et al., 2002). This involvement does not have to be a stable concept. Involvement can for example be reduced over time, when the experience of the contractor and the mutual trust increases. The contract form that is used is an important aspect in this context as well, since this determines the way in which collaboration is done.

Ansell et al. (2009) determined that collaboration has an impact on both the outcome and the process of a construction project, specifically influencing costs and the working environment. Since collaboration influences client’s objectives, it is an important choice option in this research. Moreover, since the CPA enhances longer term relations which is often associated with closer collaboration, the way in which this collaboration is structured becomes even more important in cases where a CPA is implemented (Izquierdo & Cillán, 2004).

### 3.3.5. Number of contractors

In a CPA, a client has the option to award the portfolio to either a single contractor, or to multiple ones, and with this introducing competition in the portfolio. Creating a competitive environment has a significant impact on contractor performance and therefore on the success of the works within the portfolio (Tan et al., 2012). Besides Estache and Limi (2008) state that competition is the best way to limit costs. However, having multiple contractors could have disadvantages as well. One could argue that most benefits of CPA, especially on the contractor’s side, like having a predictable workflow, decreases when multiple contractors are involved in the portfolio. The choice between one or multiple contractors is therefore an important decision within a CPA.

### 3.3.6. Organisational structure

The construction sector is characterised by its project-based way of working. This requires a certain organisational structure that differs from those of other organisations. This difference is displayed by the fact that quite some literature specifically studies project-based organisations, or PBOs (Thiry & Deguire, 2007). When implementing a CPA, as with programmes, this project-based character partly remains, but a new organisational 'layer' is added. Lycett et al. (2004) for example describe the appointment of a programme manager as a part of programme management, indicating that this extra viewpoint also requires an extra organisational layer. However, appointing a programme manager is not the only way in which programmes can be organised. One could also think of assigning a complete programme team to the task, or leaving it to multiple separate project teams with some form of coordination between them. These considerations can be made for CPA as well, and define how the CPA is structured.

### 3.3.7. Combination with other approaches

CPA can be combined with other innovative organisational approaches, like the 2-phase approach. For example the water board WDODelta mentions the combination of a CPA with a building team (Dutch: bouwteam) approach, which stimulates closer collaboration between different parties (WDODelta, 2022). Moreover, Rijkswaterstaat (2022) combines the 2-phase approach with the CPA and applies this to the projects Zandkreeksluis and Sluizencomplex Hansweert, jointly called 'Zeeuwse sluizen'.

### 3.3.8. Procurement procedure initial tender

For every procurement within the EU above a certain monetary threshold, a predefined EU procurement procedure has to be followed (Aanbestedingswet 2012). A CPA could for example be combined with an innovation partnership or a competitive dialogue. The chosen procedure has an influence on different determinants of project success, like transaction costs, and is therefore an important consideration in projects (Soliño & de Santos, 2010). This statement is also underlined by Tang et al. (2019), who define different procurement variables, of which a large part is an outcome of the procurement procedure, that influence the success of sustainable building. Since a CPA is implemented with certain objectives in mind, it is important to think about the procurement procedure when implementing a CPA.

### 3.3.9. Way of awarding secondary works

In every CPA, some kind of bundling of works is performed. This means that after the initial tender of the portfolio as a whole, the secondary works have to be awarded in some way. In case of multiple contractors, the contractors could for example enter in a mini competition. If only one contractor is involved, the client has to design a way in which it can be determined whether the contractor performed well enough to continue with the other works (de Bouwcampus, 2020).

In most cases, some kind of awarding on the basis of certain criteria is needed. For example, for the renovation of the Koninginnensluis, "the client intends to award the Houtribsluis as a repeat order in case of good performance of the contractor" (TenderNed, 2023). Which criteria are used and how and when they are measured differs per situation. The client can for example determine the fitness of the contractor in the design phase, or later in the realisation phase (Rijkswaterstaat, 2021).

### 3.3.10. Composition of bundling

A set of works can be bundled in different ways. To start with, a client can for example have a renovation task of 20 bridges. The first choice that has to be made, is which part of these 20 bridges are combined in one contractual portfolio. This choice influences the size of the

contract, which has an influence on, among other things, the procurement costs (Estache & Limi, 2008).

Next to that, within the contractual portfolio, in case of five works for example, two works can be part of the initial tender, and the other three can be awarded one by one afterwards. The client has to determine a certain way in which this composition of bundling is done. The optimal way of bundling depends on the objectives that the client wants to reach (de Bouwcampus, n.d.b).

#### 3.3.11. Organisational embedding

The importance of the CPA, especially considering the large renovation and replacement wave in the Netherlands, is for involved experts quite evident (de Bouwcampus, n.d.; Rijkswaterstaat, 2021). However, this might not be the case for other employees in the client's organisation. Wong and Avery (2009) state that for sustainable innovations to thrive in organisations, it is important to have a good embedding in the whole organisation in order to change the culture of the organisation as a whole. The same goes for the CPA. If everyone in a client's organisation understands what a CPA entails and what the benefits of the approach are, it enhances the preservation of knowledge, which is a challenge in a project-based organisation (Koskinen & Pihlanto, 2008). De Bouwcampus (n.d.b) for example state that the exploratory study of the bridges portfolio came about because of commitment from the line organisation and management. The way in which line organisation and management is involved in the CPA and with this how the CPA is embedded in the organisation, is an important variable for the implementation of a CPA.

### 3.4. Legal boundaries

This section provides a legal perspective on the research topic at hand. Even though the core of this research is an organisational question in a technical context, a contractual portfolio approach is inherently comprised of legal aspects as well. These may not form a direct answer to the research question, but do provide a framework within which the research question can be answered.

It is important to note that the legality of a certain procurement structure is always determined on a situational basis. This means that this research does not aim at qualifying whether certain choices that a client can make are legal. Instead, it gives guidance on the options that are described by the Dutch procurement law.

#### 3.4.1. General limitations

The fundamental principle of EU procurement law is that governmental bodies are obligated to procure projects by means of a prescribed European procurement procedure (Aanbestedingswet 2012). Additionally, it prescribes the concept of proportionality, meaning that aspects concerning procurement, like the selection and award criteria, must be reasonable in comparison to the object. As a particularisation of this, clustering of projects is in principle not allowed (art. 1.5 Aanbestedingswet 2012). Furthermore, in a general sense, a client's choices may not limit competition in an artificial manner (art. 1.10 Aanbestedingswet 2012).

When clustering is performed anyhow, the client should take note of the following three aspects:

- > the composition of the relevant market and the impact of bundling on the accessibility of the project for SMEs;
- > the organisational consequences and risks of bundling for client and contractor;
- > the degree of coherence of the projects (art. 1.5 Aanbestedingswet 2012).

These aspects are incorporated in market strategies of public clients. For instance, the municipality of Amsterdam describes that with what they call 'portfolio contracts', the clustering may not hamper the accessibility of SMEs. Therefore, selection and award criteria are formulated in such a way that SMEs have equal chances (Gemeente Amsterdam, 2020). Rijkswaterstaat devotes a part of their guidebook contractual portfolio approach to this notion as well, stating that attention should be paid to the fact that the contractual portfolio approach might have undesirable external effects on SMEs and the market in general (Rijkswaterstaat, 2021, p.10).

Furthermore, for clustering in the context of CPA, a specific legal form outlined in procurement law must be employed. For this, three possible forms can be identified, which will be discussed in subsequent sections.

#### 3.4.2. Framework agreement

The so-called framework agreement forms the first option with which a client can shape the portfolio approach. Dutch procurement law defines a framework agreement as follows (art. 1.1 Aanbestedingswet 2012):

*A written agreement between one or more contracting authorities or special-sector undertakings and one or more economic operators for the purpose of establishing the terms and conditions of public contracts or special-sector contracts to be awarded during a given period.*

Therefore, the framework agreement, as the name suggests, provides a framework within which client and contractor can establish more specific commitments. Since the conditions under which these commitments can be made are formulated in the framework agreement, the procurement of these subsequent works can be done in a relatively simple and fast way (Gur et al., 2017). Additionally, framework agreements enable clients and contractors to enter into a longer-term relation (Lam & Gale, 2014).

On the other hand, procurement law also prescribes three limitations when entering a framework agreement (art. 2.140 Aanbestedingswet 2012). Firstly, all works that are associated with the framework agreement can only be procured to the parties that entered in the framework agreement. Next to that, parties may not make significant changes in the terms and conditions as defined in the framework agreement. Lastly, a framework agreement may not cover a period of more than four years.

Given the choice for a framework agreement as legal form for the CPA, a client can choose to allow either one or multiple contractors to enter the framework agreement. Article 2.142 (Aanbestedingswet 2012) describes that if only one contractor is part of the framework agreement, works can be awarded to this contractor on the basis of conditions as described in the framework agreement. Moreover, a client can notify the contractor in writing and may request a supplement to the original tender offer.

If a client chooses to admit multiple contractors to the framework agreement, the complexity of awarding the works increases. Article 2.143 (Aanbestedingswet 2012) describes the three ways in which this can be done:

- > According to conditions in the framework agreement, without opening a new tender. This can be done if the framework agreement describes all the conditions on the basis of which the works can be awarded, and if these conditions were already specified in the procurement of the framework agreement.

- > By partly opening a new tender for the involved parties, if the conditions for this were already specified in the procurement of the framework agreement, and this structure is predefined in the framework agreement.
- > By completely opening a tender for the involved parties, if the framework agreement does not specify the conditions regarding the awarding of the works.

### 3.4.3. Repeat order

Article 2.36 (Aanbestedingswet 2012) outlines the possibility of awarding new works to the same contractor as the original works without public announcement, within three years after the awarding of the original works. This can be done under the following circumstances:

- > These works are similar to the original works for which a procurement procedure is followed.
- > The client already described the additional works and the conditions under which these are being awarded in the original procurement documents.
- > The client mentioned the possibility to procure additional works without an open procedure.
- > The client accounted for the additional works in the estimation of the value of the original contract.

Dutch procurement law only describes this possibility to award works without an open procedure, without assigning a name to it. The term repeat order is derived from RWS' 'Guidebook Contractual Portfolio Approach' in which the different forms are described as well (Rijkswaterstaat, 2021). In the guidebook, both the three-year rule and the constraint regarding similarity are considered as downsides of the repeat order (Rijkswaterstaat, 2021, p. 64).

### 3.4.4. Revision clause

The last way in which a contractual portfolio approach can be legally designed is a revision clause (art. 2.163c Aanbestedingswet 2012). A revision clause is described as a way in which works can be awarded as an amendment of the original contract, without following a new procurement procedure. This can however only be done if these possible amendments are described as a clause in the original procurement documents. Such a revision clause must have the following characteristics:

- > It describes the scope and type of possible amendments.
- > It describes the conditions under which these amendments can be used.
- > It does not describe amendments that change the type of work that is described.

Compared to the repeat order, procurement law is less demanding when it comes to substantiating the similarity of the clustered works. Instead of having to explain the similarity, the client is only bound to the fact that it must be the same 'type of work'. This is also considered as a benefit of the revision clause by Rijkswaterstaat (Rijkswaterstaat, 2021, p. 61).

In practice, the revision clause is often referred to as 'option', which is a specific type of revision clause according to procurement law, that is best applicable to CPA situations.

## 3.5. Final remarks

This chapter presents the required information derived from a literature review that forms the basis for the remaining analysis. It describes a preliminary definition, a variety of objectives and a list of choice options, and it provides a first step on how these might be linked. In the next chapter, results from the case study will be used to further define these aspects.

# 4

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## RESULTS

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This chapter presents the outcomes of the conducted research. It provides a comprehensive and detailed description of the information that is derived from the case study, without drawing conclusions or describing recommendations. In order to address the research questions in the next chapter, the first part of this chapter is structured based on the sub-questions. This means that firstly the definition is discussed, after that the objectives and then the choice options. The chapter is concluded with the main findings from the expert validation session.

The chapter solely functions as a description of the outcomes. This means that relations in the system are described, reasoning from causes to effects. In other words, since options influence factors, and factors influence the attainment of objectives, the line of reasoning in this chapter follows this direction. In subsequent chapters, which address the question what choices a client can make to reach its objectives and provides clients with recommendations, this line of reasoning is reversed.

#### 4.1. Definition & positioning

The contractual portfolio approach is a term that gained significant relevance in recent years, with multiple public clients in the construction sector adopting the approach and incorporating the term into their purchasing and market strategies. However, in almost all cases, using this term does not entail constructing a definition for it. Instead, every client has its own interpretation of CPA, associating the term directly with the specific case in which the approach is implemented, while lacking an overarching understanding of its essence in general. This notion finds support in statements provided by respondents during the interviews. When asked about the definition of CPA, multiple respondents emphasise the lack of a clear definition. However, when incentivised to think about the definition by being asked which aspects they think are essential for an approach to be called a CPA, interesting things come up that are similar for most respondents.

The definition that is defined on the basis of academic literature before entering into the interviews is the following:

*The bundling of a logical set of similar works into one initial tender.*

The output from the interviews closely aligns with this definition. Therefore, with quotes from respondents, different parts of this definition can be confirmed. Aspects that are mentioned in this context are the following.

*"There is some repetition and you do not want to tender separately every time"*

*"CPA is clustering of similar objects"*

*"There is seriality"*

*"A CPA is on the contracts, not only an internal method"*

*"CPA is about purchasing"*

*"With CPA you try to get something done that cannot be done with normal procurement"*

*"A repetition of moves"*

*"Bundling of works that are similar in nature"*

*"It is useful with a series of orders"*

*"The execution of similar works one after another"*

Terms such as clustering, bundling and combining describe the act of 'bundling' multiple works. Thus, it can be confirmed that CPA involves some form of bundling. The specific interpretation of this bundling, whether it refers to works, projects or objects, varies from case to case. However, the term 'works' is the most comprehensive one, since it encompasses both projects and objects. At the same time, it excludes service contracts, since these have different objectives, regulations and dynamics.

Additionally, respondents provide several quotes concerning a 'logical set of similar works'. The concept of similarity is mentioned multiple times, and despite variations in the 'logic' behind a set of works in a CPA from case to case, all respondents claim to have performed bundling on the basis of some form of logic. Aspects such as 'seriality', 'repetition' and the notion of 'works after another', indicate that CPA is confined to the bundling of works that are done consecutively. While this holds true in multiple cases and is often logical as it facilitates cross-project learning, not every case adheres to this serial process. In a CPA, works can be done both consecutively and in parallel, or, more commonly, consecutively with some degree of overlap. Hence, seriality is not included in the definition.

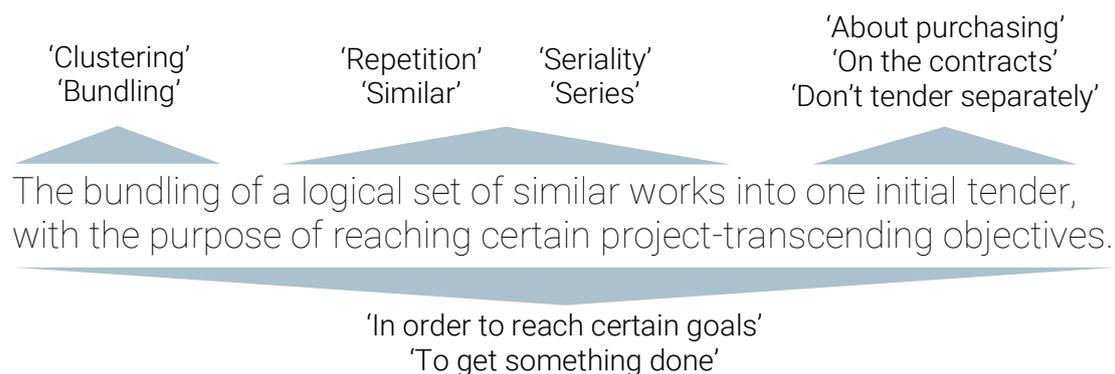
Then, all respondents agree on the fact that a CPA is an approach that concerns procurement. It is not merely an internal approach that can be executed within an organisation. On the contrary, it is a way in which a client enters into relations with market parties. This is formulated with 'one initial tender', and can be substantiated by multiple quotes stating that a CPA is implemented to avoid separate tendering for each individual work, that it concerns purchasing and that it is not an internal method. The word 'initial' is crucial here, since multiple cases entail some form of awarding secondary works, resulting in more than one tender within the CPA.

An aspect that emerges prominently in the interviews, although not directly derived from the literature, is the connection between CPA and achieving certain objectives. Nearly all respondents mention that a CPA is implemented with the intention of reaching objectives that could not have been reached with a conventional form of procurement. Bundling works solely based on practical factors like adjacency, without the client pursuing certain overarching objectives, is not considered a CPA. Therefore, the definition of CPA on the basis of both literature and interviews is the following:

*The bundling of a logical set of similar works into one initial tender, with the purpose of reaching certain project-transcending objectives.*

Figure 4-1 gives an overview of quotes from the interviews linked to specific parts of the definition.

Figure 4-1 - Definition with interview quotes (made by author)



In the theoretical framework, the CPA is positioned in relation to multiple similar approaches that are in some way related to the CPA. During the interviews, most respondents were not acquainted with the majority of these approaches, making it impossible to substantiate the positioning from the theoretical framework. Nevertheless, some aspects did emerge in the interviews. To start, multiple respondents compare the CPA with the programmatic approach. In line with literature, they define the programmatic approach as a broader approach, more like a 'theme', where the CPA specifically concerns the bundling of works. Therefore, within a programmatic approach, multiple CPAs can exist, which is a characteristic that can be observed in multiple cases. For example, a respondent describes how their programme consists of four contractual portfolios. Next to that, the programmatic approach is considered as a way in which an organisation can create an overarching view over multiple projects, which implies that this is merely an internal approach, whereas the CPA is in essence a procurement strategy and therefore an external approach. To illustrate this, a respondent describes how a team is installed on a programme level, which made the decision to procure by means of a CPA.

Next to the comparison to the programmatic approach, multiple respondents describe the framework agreement as the legal tool that is used to design the CPA. This aligns to the

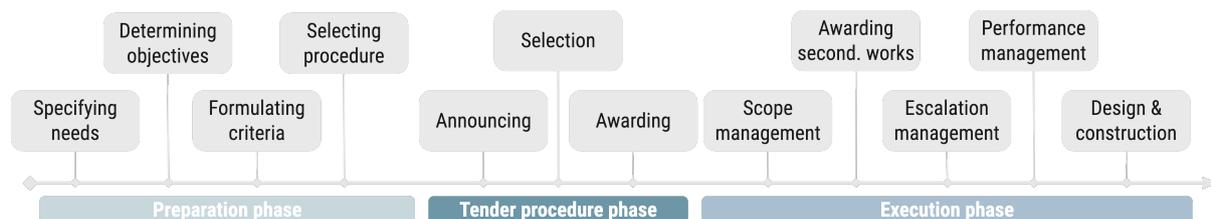
theoretical framework, in which the framework agreement is described as one of the three legal forms of the contractual portfolio approach.

## 4.2. Description of phases

The interviews reveal that both objectives and choice options vary depending on the phase of the procurement process. To ensure a coherent and logical structure of this part of the results, a distinction is made on the basis of these phases.

According to knowledge centre for procurement PIANOo (n.d.), this process constitutes of three phases: the preparation phase, the tender procedure phase and the execution phase. Figure 4-2 provides an overview of these phases and the corresponding responsibilities for the client. In the preparation phase, the client specifies its needs, formulates its objectives and selects its procurement procedure. In other words, this phase is characterised by making choices that influence other parts of the process. Then, the tender procedure phase entails following the chosen predefined tender procedure, during which the tender is announced, the contractors are selected and the assignment is awarded to one or multiple contractors. In the last phase, the contractor executes the work, during which the client manages the contract and takes on design and construction responsibilities, depending on the contract. So, choices are made in the preparation phase that influence the subsequent phases 2 and 3. These two phases exhibit different dynamics. For example, 'collaboration' in phase 2 entails collaboratively eliminating uncertainty and defining the task that lays ahead, whereas collaboration in phase 3 implies a collaborative output. In the following sections, this distinction is taken into account.

Figure 4-2 - Phases of the construction process (made by author using Miro)



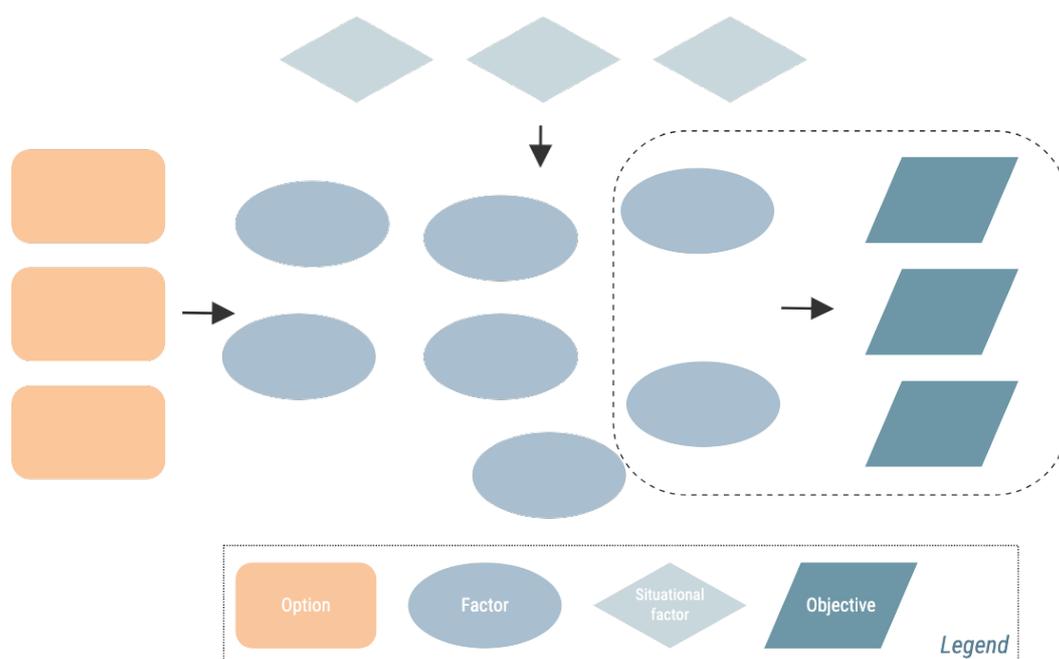
## 4.3. Objectives

To eventually address sub-question 2 in the next chapter, the results regarding the objectives of clients are presented. Rather than solely describing the objectives in isolation, this section will also explain their relations with other objectives and factors in the system. This is the first step towards linking the objectives to the choice options clients have.

Consistent with what is mentioned in previous chapters, this research focusses on objectives on a portfolio level. This means that respondents in the interviews are asked not just about the objectives they pursue, but specifically about the objectives they consider while opting for a CPA.

The viewpoint of this section can be made clear by means of a system diagram. This is a visual representation of a system, with choice options, factors, external factors and objectives along with how they relate to each other (de Haan & de Heer, 2015). As depicted in figure 4-3, this initial section describes the objectives and how factors in the system relate to them. It is worth noting that while certain objectives may be referred to as end-objectives in a specific context, from a system perspective, they function as a factor since they serve to achieve other objectives.

Figure 4-3 - System diagram, objectives perspective (made by author using Miro)



#### 4.3.1. A large set of objectives

The first noteworthy observation is that clients decide to adopt a contractual portfolio approach with many objectives in mind. All the objectives derived from literature in the theoretical framework are mentioned and recognised by the respondents. Given the current challenges in the construction sector and the collective desire for improvement, CPA is sometimes considered as a holy grail that solves all existing problems. This effect is reinforced by the McKinsey report, which proposes CPA as one of the solutions for present-day challenges (Rijkswaterstaat, 2019).

Even though CPA indeed shows problem-solving potential, the case study proves that a lack of focus on specific objectives can endanger the effectiveness of the CPA. In multiple cases, there are numerous objectives pursued simultaneously, resulting in a situation where none of them can be addressed in a comprehensive manner.

For instance, in one case, a list of key performance indicators was created at the start of the CPA. However, after two and a half years, it was concluded that this list was too lengthy and required confinement. Similarly, in another case, limiting the amount of objectives and creating focus are specifically mentioned as points of improvement after a three-year CPA implementation. As a last example, a client constructed a list of objectives at the start of the CPA, which in a later phase of the process was considered as a long list, out of which a short list was distilled.

In addition to the quantity of objectives, it is interesting to note that respondents mention that some objectives contradict each other to some extent. Pursuing certain objectives may endanger reaching others. Therefore, these objectives impose the need for a specific choice on whether the one or the other is focussed on.

#### 4.3.2. 'Towards a vital infrastructure sector'

More often than expected, clients choose a contractual portfolio approach with the adage of 'towards a vital infrastructure sector' in mind. In some situations, it is incorporated as an objective in the sense of 'attractiveness for the market'. In others, it is at least mentioned as the

context of the problem. Therefore, clients have a lot of focus on collaboration with market parties and on the influence of their choices on other parties in the sector. They see a contractual portfolio approach as one of multiple solutions to the current unhealthy aspects the construction sector entails. However, interestingly, this is also the aspect that is most often mentioned as the hardest to achieve. Aspects like production capacity and cost reduction are quite easily reached with a CPA, while clients are still struggling with their collaboration with market parties. Frequently, it is mentioned that the relation is still a relatively 'classical' one, with which they refer to a situation in which the distance between client and contractor is relatively large and the contractor takes on a lot of responsibility.

### 4.3.3. Overview

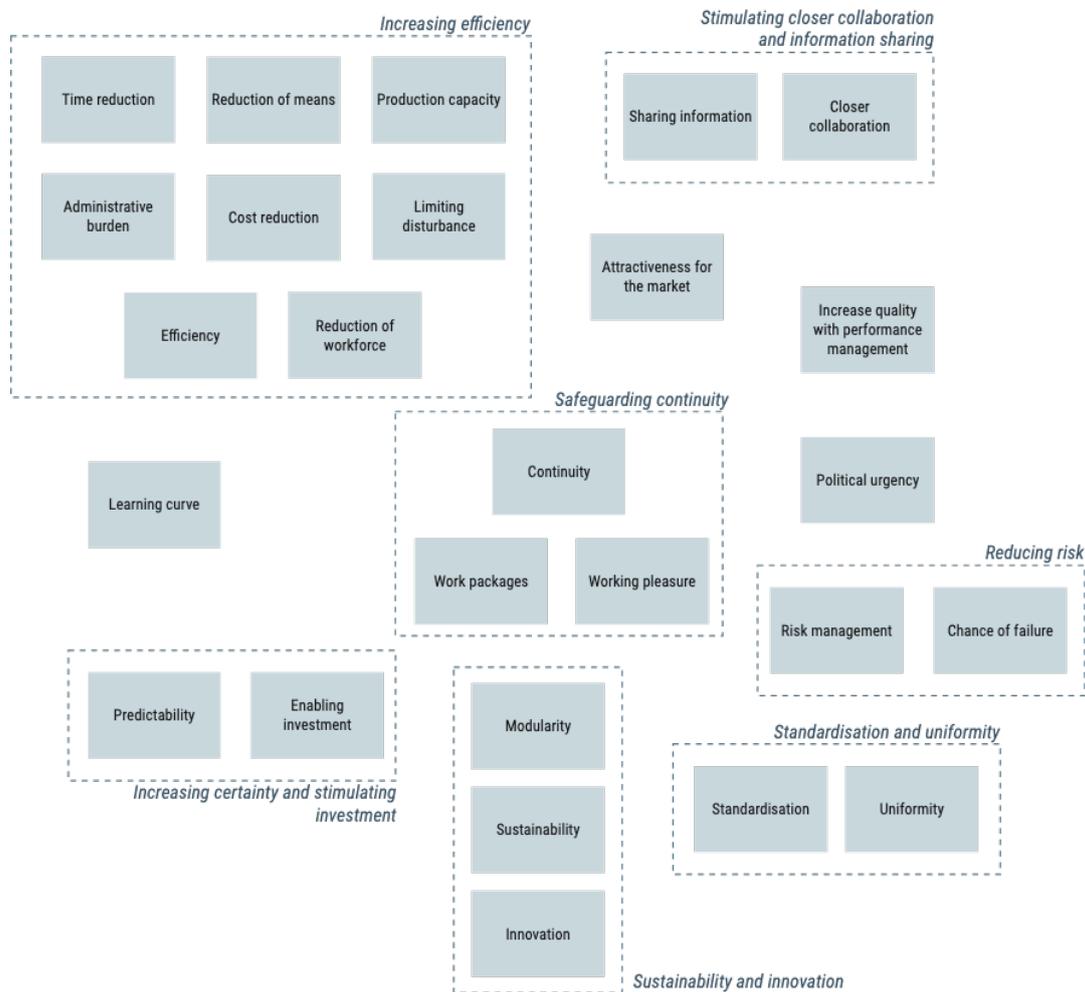
In total, 26 different objectives are mentioned during the interviews. Multiple respondents mention that these all tend to have overlap and to be linked. Most of the objectives do not stand on their own, instead, some are serving to reach others, where others are an overarching objective of multiple more specific ones. This necessitates the structuring of objectives and the identification of the most significant ones. To achieve this, table 4-1 presents an overview of the frequency with which the objectives are mentioned.

Table 4-1 - Overview of objectives

Objective	Times mentioned in total	Number of interviews in which objective is mentioned	Number of interviews in which objective is mentioned as 'achieved'
Administrative burden	1	1	1
Attractiveness for the market	6	5	2
Chance of failure	6	3	2
Closer collaboration	35	9	3
Continuity	23	6	3
Cost reduction	22	9	3
Efficiency	24	7	4
Enabling investment	17	7	3
Increase quality with PM	26	8	1
Innovation	17	7	3
Learning curve	56	10	5
Limiting disturbance	5	4	2
Modularity	2	2	1
Political urgency	5	2	0
Predictability/certainty	19	7	4
Production capacity	21	9	3
Reduction of means	6	4	2
Reduction of workforce	9	6	2
Risk management	7	4	2
Sharing information	5	4	1
Standardisation	12	4	1
Sustainability	35	10	4
Time reduction	30	9	5
Uniformity	8	4	3
Working pleasure	8	4	2
Work packages	6	5	3

This frequency of mentions is a useful starting point for the selection of main objectives. However, the weight that respondents attached to the objectives during the interviews is taken into account as well. This is a relatively intangible aspect that is difficult to put into numbers. It includes words like ‘important’ and ‘pivotal’, but can also entail a raise in voice or a facial expression. Moreover, some objectives might be of importance when combined with similar ones. For example, political urgency is only mentioned five times in the interviews, and does not fit to another objective. Therefore, political urgency is not taken into account in the subsequent analyses. On the other hand, administrative burden is only mentioned once, but fits perfectly in the overarching objective efficiency. To structure all these objectives in overarching ones, an objectives map is created in figure 4-4. In this map, a structure can be viewed on the basis of logic from the interviews. For example, innovation is in the interviews only mentioned in the context of sustainability, and cost reduction, time reduction and production capacity can all be seen as forms of efficiency.

Figure 4-4 - Objectives map (made by author using Miro)



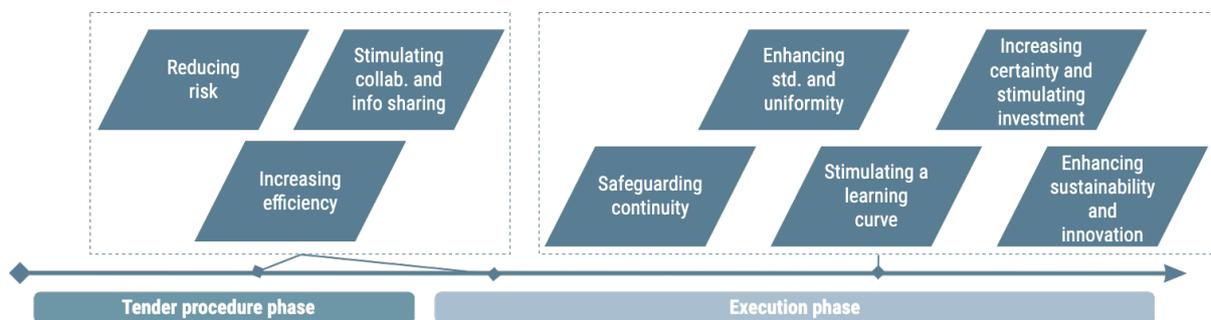
Some objectives might be of little relevance individually, but combined they can play a large role. Therefore, all seven groups of objectives are taken into account. Learning curve is considered as well, since it is mentioned very often as an important CPA goal, whereas performance management is regarded more as a means to an end rather than a goal in itself, and thus, it is not considered as an objective in further analysis. This does not mean that all objectives in the remainder of the research are end-objectives. Some are, but others are taken into account because of their importance regarding the dynamics of the system.

So, resulting from table 4-1 and figure 4-4, eight main objectives can be identified:

-  Enhancing standardisation and uniformity
-  Enhancing sustainability and innovation
-  Increasing certainty and stimulating investment
-  Increasing efficiency
-  Reducing risk
-  Safeguarding continuity
-  Stimulating a learning curve
-  Stimulating closer collaboration and information sharing

In the next section, a comprehensive description of these eight main objectives will be given. As explained in the beginning of this chapter, this description will contain a view on relations between objectives and factors in the system. Some objectives only play a role in the execution phase, while others play a role in both the procurement procedure phase and the execution phase, with different dynamics in both phases. Figure 4-5 presents an overview of the objectives that are relevant in each phase of the process. This distinction is included in the following part of the analysis as well.

Figure 4-5 - Objectives per phase



#### 4.3.4. Description per objective

In this subsection, a description is given of the main objectives that can be derived from the interviews. In this description, the relation of these objectives with other objectives and factors in the system are highlighted.

##### *Enhancing standardisation and uniformity*

The objective of increasing standardisation and uniformity is mentioned nineteen times and appears in nine interviews. Many respondents consider it as an important objective for CPA, as CPA enables both clients and contractors to utilise consistent techniques and processes for multiple works. This can be technical, for example by implementing a certain construction method over multiple projects, or organisational, by for example following a standardised process in cases of disputes between clients and contractors. It mainly plays a role in the execution phase, as this is where the benefit of repetitive works actually creates the potential to make a step regarding standardisation and uniformity.

The interviews show the importance of this objective both within a portfolio and the effect it can have after the portfolio is completed. For example, in one case, it is mentioned that replacing the controlling systems of ten different objects by one standardised system, makes it possible for the operating party to control in a more centralised way. In another case, it is mentioned that regular maintenance is also enhanced if renovation is done in a standardised manner.

Some form of continuity in the portfolio is pivotal for reaching this objective, since this enables parties to secure the same way of working over multiple works. This can be continuity in persons, or it can be safeguarded in another way. Additionally, respondents mention that similarity of the works has to be secured for the contractor to achieve this desired standardisation.

#### *Enhancing sustainability and innovation*

Sustainability emerges as a consistent objective in every interview. In total, 34 quotes contain the term sustainability, making sustainability the second-most mentioned objective after learning curve. Additionally, innovation came up sixteen times in seven interviews, consistently being a supporting factor for sustainability. This focus on sustainability is reflected in the actions of clients. Multiple clients use CPA as a way to insert key performance indicators based on sustainability. For example, the Environmental Cost Indicator (ECI) (Dutch: milieukostenindicator, MKI) is mentioned by five respondents as an important KPI within the CPA. Furthermore, reducing emissions and using sustainable materials are highlighted as well. Moreover, reusing materials is mentioned as an aspect that is specifically facilitated by the contractual portfolio approach, since it enables parties to allocate materials from one work to another within the portfolio. For instance, in one portfolio, the excavation of a certain work lead to the original piles being too short for this specific work. Since the condition of these piles was still relatively good, they could be utilised in a subsequent project within the portfolio.

Sustainability is also mentioned multiple times as an objective that is successfully achieved through the implementation of a CPA. In one case, the respondent states that “in terms of sustainability, we are making a big step”. In total, four respondents consider a CPA as a successful tool to reach sustainability. Respondents state that the CPA enables them to work towards sustainability over multiple works, partly because it enables contractors to invest in sustainable innovation in an early stage and earn this back over a longer period. Moreover, the importance of considering sustainability in the procurement process is underlined by multiple respondents, for which CPA is a way to take a longer time for the procurement and to make sure sustainability is incorporated in this. To reach sustainability, it is important to create a certain learning curve, which can be done with closer collaboration or performance management, or to increase the contractor’s willingness to invest, which can be promoted by giving him certainty.

The degree to which CPA contributes to sustainability and innovation does vary from case to case. Respondents explain that in cases where longer-term objectives like sustainability and innovation are the primary focus and time is allocated to pursue these, significant progress is made in these areas. On the other hand, in situations where aspects like urgency and efficiency take precedence, sustainability and innovation tend to be overlooked. As an exemption to this, material reduction is an objective that is considered as beneficial from both an efficiency- and a sustainability perspective.

#### *Increasing certainty and stimulating investment*

Increasing certainty and stimulating investment are relevant aspects according to several respondents. Viewing the system as a whole, they are often considered as serving for other end-objectives. Both are closely related, since assuring certainty is needed to stimulate

contractors to invest. With these investments, other objectives like sustainability can be reached, which renders result in the execution phase of the process. Stimulating investment is mentioned a total of seventeen times, divided over seven interviews, whereas certainty is mentioned nineteen times in ten interviews.

According to multiple respondents, there is a need to stimulate contractors to make investments in an early phase of the portfolio, with the expectation of earning back these investments over multiple works within the portfolio. For instance, in a certain case, the contractor made a large step in electrification of his equipment, which, according to a respondent, he could only do because he knew he could earn this investment back over multiple projects. On the other hand, if a contractor is not certain of the secondary works being awarded to him, he will be reluctant about investing. One respondent for example expects to award the secondary works during the execution of the initial assignment, with the intention of initiating the investment in the secondary work while the initial work is still ongoing.

Creating certainty for a contractor inevitably limits the option of managing performance and attributing consequences to this. If a contractor knows his future in the portfolio is uncertain, it will not be eager to invest. Next to this, if certainty is pursued by assigning the whole portfolio to one contractor, it creates dependency.

### *Increasing efficiency*

Efficiency as a term is mentioned 23 times over seven interviews. However, efficiency is a very broad term, under which multiple more specific objectives can be positioned. Efficiency can concern:

- > Administrative burden
- > Cost reduction
  - o Transaction costs
  - o Execution costs
  - o Costs of failure
- > Time reduction
  - o Procurement time
  - o Execution time
- > Material reduction
- > Reduction of required workforce
- > Production capacity

Administrative burden is mentioned once, cost reduction is mentioned 22 times, time reduction 30 times, material or means reduction six times, reduction of workforce nine times and production capacity 21 times, resulting in a total of 112 quotes for the goal efficiency in a broad sense. A large need for efficiency can be seen as a logical consequence of the current situation in the construction sector. Most respondents feel some kind of urgency, imposed by the large renovation and replacement task that lays ahead, in combination with limited time, budget, materials and labour force. Often, this urgency to become more efficient is the direct cause for choosing CPA, while other, less urgent objectives like sustainability are added as an 'extra'. Interestingly, objectives like sustainability and innovation are often combined with efficiency, because clients consider both as important aspects in the current situation. However, at the same time, both tend to contradict each other because a large focus on limiting time and costs, results in a situation where time to think about longer-term objectives is lacking.

Certain forms of efficiency, like reducing transaction costs and procurement time, are focussed on the tender procedure phase and are therefore a direct consequence of the implementation of CPA. For example, going through one procurement process for ten bridges is always faster

than ten separate ones. However, other aspects focus on the execution phase and therefore require the contractor to work in a certain way. As mentioned by a respondent, “reasoning from theory, it is logical to expect the execution costs to decrease because of a CPA, but reality might be unruly”. This part of efficiency is connected to the learning curve, since CPA enables contractors to learn over projects and work more efficiently throughout the portfolio. However, efficiency on the contractor side can also be a result separate from learning. For example, if a contractor can do multiple works after one another, he is able to buy certain equipment instead of every separate contractor renting the equipment for every work. All of this makes efficiency an important objective in a CPA context.

### *Reducing risk*

Risk reduction is mentioned seven times and decreasing chances of failure six times. Together they are mentioned in seven interviews. Most often, it is being mentioned that CPA enables the client and the contractor to spread risks over multiple projects. Multiple respondents link this to learning curve, by stating that when both client and contractor get accustomed to a certain way of working, the chances of failure will decrease. Another respondent states that if both parties know what to expect, chances of pitfalls like time- and cost overruns will decrease.

Next to these technical risks, risk reduction also has a procurement-related aspect to it. As a respondent mentions, every time a client initiates a procurement process, there is a chance that a suitable contractor is not being found. With CPA, this risk is inherently reduced because multiple procurement processes are substituted by one, which plays a role in the tender procedure phase. However, this risk extends throughout the execution phase, since a contract can still fail in a later stage.

### *Safeguarding continuity*

Multiple respondents explain that some form of continuity is essential for the effectivity of a CPA. This objective is mentioned 23 times in six interviews, mostly in the context of continuity of involved actors. Respondents state that to create a learning curve and to make sure knowledge does not get lost in the portfolio, involved actors have to be stimulated to stay involved throughout the entire portfolio, particularly in the execution phase. Compared to a situation where an organisation jumps from project to project, a CPA involves the benefit of securing the transfer of knowledge from one work to another within the portfolio. However, this benefit can only be exploited if some form of continuity is safeguarded. As one respondent explains, this does not only entail technical know-how, but includes understanding the way of working within the portfolio. With aspects like working pleasure, a constant workflow and creating interesting work, this continuity can be secured. Another respondent adds to this that it is not always possible to make sure the same individuals are involved in the entire portfolio. Therefore, this respondent explains that continuity should be safeguarded in other ways as well, for example by making sure the way of working in the portfolio is embedded in the rest of the organisation.

### *Stimulating a learning curve*

The term learning curve emerges in all of the interviews and is mentioned 55 times in total, making it the most common individual objective for implementing a CPA. Clients generally perceive CPA as a method that enables both the contractor and the client to start with a work, learn from it, apply these lessons-learned to the next project and so on. In one case, it is noted that in every work, unforeseen problems, to which this respondent refers as “behind the wallpaper issues”, occur. If a contractor encounters these during the first work, he can make a better prediction of what issues will arise in the second. One respondent mentions that this cross-project learning can also be stimulated without CPA, but that this has to go via the client, while with CPA it is automatically guaranteed on the contractor side. Moreover, contractors can

be stimulated to think about securing a learning curve in an early stage, for example by including this in the award criteria of the initial tender.

This learning curve is related to many aspects of a construction process. Not only is it a technical matter, making it possible for a contractor to increase its knowledge on how to implement a certain technique, it is also an organisational matter, enabling both client and contractor to learn how to work together in a good way. Since a learning curve is related to repetitive works, it is only applicable to the execution phase.

Most of the time, creating a learning curve is not an end-goal for the client. CPA specifically increases this learning capacity, via which other objectives can be reached. On the one hand, a client can aim for a learning curve in order to reach objectives like sustainability, while on the other hand it can also be a more 'practical' matter, like wanting the process to go quicker. When looking at the other side, it can be noticed that certain aspects are important to reach a learning curve. What is mentioned multiple times, is that some form of continuity is vital for cross-project learning, making this objective closely related to the previous one. Next to that, information sharing between contractors, which has proven to be difficult, and the fact that the works in the portfolio have to be similar to some extent, are determining factors for a learning curve. Since almost all other objectives are related to learning curve and every CPA case has this as a goal, having a learning curve as a goal does not have a large influence on the choices that are made.

In four interviews, CPA is mentioned as a successful technique to reach a learning curve. Moreover, in six interviews, the lack of learning curve in the 'normal' situation without a CPA, is mentioned as a problem for the sector, making it a very relevant subject.

So, on the one hand, the end-objectives clients pursue can differ, and on the other hand, the sub-objectives or factors that lead to these end-objectives can differ as well. However, stimulating a learning curve is an aspect that is inherently associated with CPA and therefore claims a central position in the system via which most relations are defined.

#### *Stimulating closer collaboration and information sharing*

Closer collaboration is mentioned 35 times divided over nine interviews, and information sharing is mentioned five times in four interviews. In all cases that information sharing is mentioned, it is associated with closer collaboration. When looking at these objectives, three things stand out. Firstly, the fact that closer collaboration and information sharing is clearly an objective that some clients actively pursue, while others may not prioritise them when implementing a CPA, despite the fact that most clients define collaboration as the context of the problem. Unlike objectives like learning curve, it is not something that is inherent with CPA. Secondly, clients often strive for closer collaboration, but frequently face difficulties in actually realising it. Multiple respondents mention that the current mode of collaboration often resembles a traditional client-contractor relation. As a third thing, it is specifically mentioned by multiple respondents that close collaboration is never a goal in itself, because it is not directly part of the portfolio output. However, it indirectly influences a multitude of end-objectives clients can aim for. Multiple respondents propose closer collaboration as a way to enhance a learning curve. For example, one respondent mentions that closer collaboration smoothens communication, which resulted in a large step in efficiency.

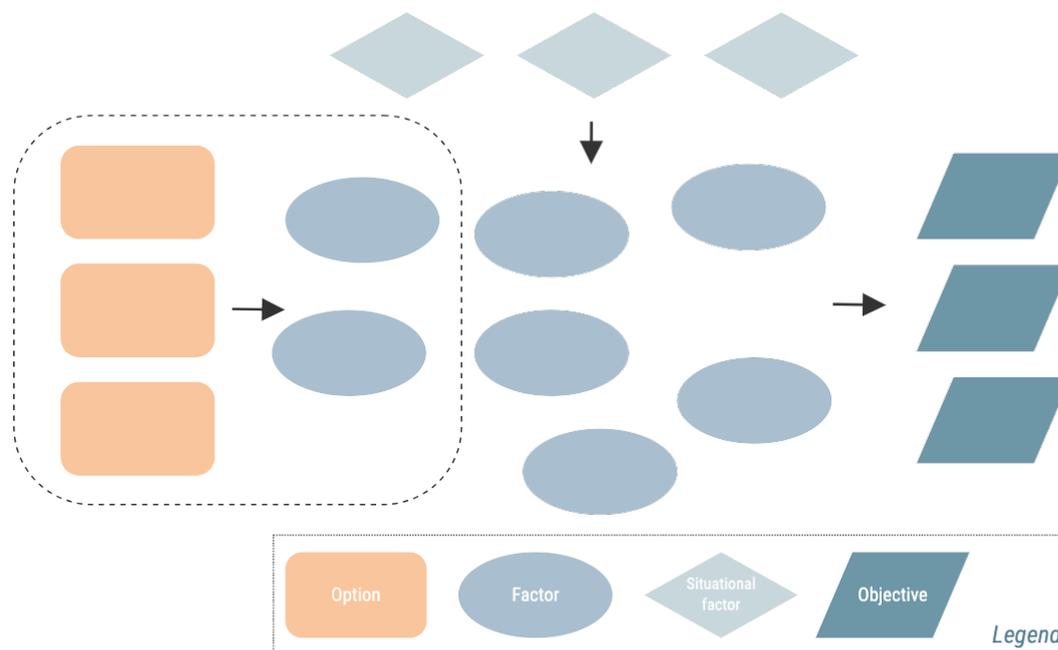
A point all respondents agree on, is that it is important for a client to take on an active role in order to reach this objective. This starts with entering in a collaboration only with parties who share the ambition of closer collaboration. Moreover, respondents explain the importance of creating mutual trust, which entails aspects like open-book pricing. Closer collaboration is also often associated with a limited amount or even only one contractor. However, this limitation also creates some form of dependency.

This is an objective that can be applied to both the tender procedure phase and the execution phase, both having a different underlying objective. For the tender procedure phase, close collaboration means collaboratively defining the task and eliminating uncertainty. In the execution phase, it entails collaboratively coming to an end product.

#### 4.4. Choice options

With the objectives of clients regarding the contractual portfolio approach clarified, the next step is to explore the options clients have to achieve these objectives. When looking at the system diagram, this section focusses on the left side of the diagram and describes how the options can influence the factors on this side. This together with the previous section, makes it possible to create links between options and objectives.

Figure 4-6 - System diagram, options perspective (made by author using Miro)



For every option, the way in which it is linked to the factors and objectives in the system is visualised in a partial system diagram. Red, dotted arrows indicate a negative relation, meaning that these options confront clients with a dilemma, either the one or the other way can be chosen. In these diagrams, end-objectives are included in order to visualise the entire system, but are not included in a specific sense. It is noteworthy that the specificity of the diagram depends on the input from the interviews, and therefore varies from option to option.

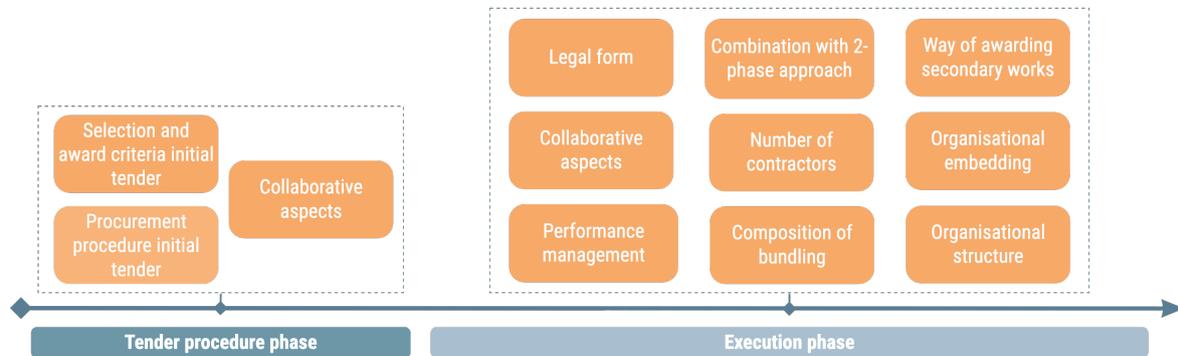
Everything that is discussed during the interviews regarding choice options can be placed under the choice options in the theoretical framework. In none of the interviews, a completely new choice option came up, even though respondents were given the room to present these. However, the content of the choice options is adapted on the basis of the interviews. Where for example 'composition of bundling' in the theoretical framework is limited to the bundling of works in the portfolio. In this chapter, the order, planning and the bundling of elements per work is included in this choice option on the basis of the interviews.

Worth noting is that it can be derived from the interviews that an overview of the available options from a broader perspective than a single organisation is lacking. As a respondent states, "we are very knowledgeable about aspects that we consider within our organisation, but we never take on the perspective of other clients, so if we could learn that from your research,

that would be very helpful". This subsection provides an overview of choice options from a multi-client perspective.

Next to that, as with objectives, the choice options can be divided in choice options that influence the tender procedure phase and options that influence the execution phase. Figure 4-7 gives an overview of the choice options per phase.

Figure 4-7 - Choice options per phase (made by author using Miro)



#### 4.4.1. Options influencing the tender procedure phase

In the following text, the three choice options that are applicable to the tender procedure phase will be described.

##### *Selection and award criteria of the initial tender*

Selection and award criteria form an important option for clients to consider in a CPA. It is mentioned 31 times and in nine different interviews. Obviously, these criteria are important in every procurement process, and, as a respondent also notices, are always based on the objectives you want to reach. However, some aspects become specifically interesting when looking at these criteria from a portfolio perspective.

Firstly, respondents note that it is important to select contractors in such a way that they are able to perform the entire portfolio of works. Selecting a contractor who is able to perform the first work, might not be suitable for the portfolio as a whole. As an example, one respondent mentions that despite the portfolio starting with a relatively simple object, they specifically selected contractors on their ability to renovate the whole range of structures.

Secondly, implementing a CPA creates the opportunity to align the criteria with specific portfolio objectives. For instance, multiple respondents mention that by implementing CPA, aspects like sustainability can be pursued more effectively on the long term, which can already be incorporated in the award criteria. Next to that, multiple respondents state that it is important to focus on collaboration, and that it is pivotal to select parties that are capable of such collaboration. As one respondent puts it, "it is important to assess during procurement whether the contractor is a suitable collaboration party". This can for example be done with collaboration assessments, on the basis of which the composition of project teams can be determined. In this regard, it is important to note that a portfolio approach inherently entails a longer-term collaboration, which increases the likelihood of project teams to change during the course of the portfolio. Therefore, as a respondent mentions, the collaboration assessments should not be focussed too much on individuals, and more on profiles and organisational culture. This focus on collaboration does differ per case, since some CPAs are very collaboration-minded while others are not. An aspect that is important in every case, is the learning curve that can be pursued with selection and award criteria. Multiple respondents mention that the way in which

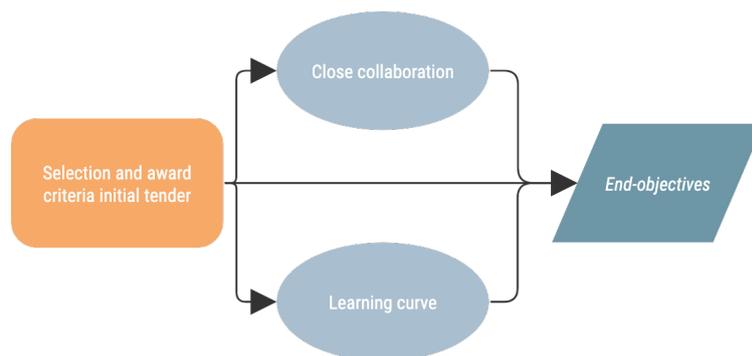
a contractor planned on safeguarding the lessons learned was incorporated as one of the EMAT criteria.

Additionally, respondents state that in portfolio situations, the focus partly shifts from ‘hard’ criteria towards sharing ambition with the bidding parties. They explain that within a CPA, they aim at selecting a contractor that understands the ambition of the portfolio and is ready and willing to align its activities to this ambition, which is often difficult to capture in SMART KPIs.

Interestingly, respondents define the legal form as a determining factor for how selection and award criteria are being dealt with. For framework agreements, it is common, logical and effective to base the criteria on the whole portfolio. In simple terms, the contractor that is best suitable for the whole portfolio is awarded with the works. For repeat orders, this is slightly more complicated. As a respondent explains, in most cases, they are bounded by a limited amount of EMAT criteria, which they do not want to ‘waste’ on a secondary work. For these cases, clients indirectly focus on the whole portfolio by specifically focussing on the way a contractor secures lessons-learned.

As described in the previous section, both learning curve and collaboration are factors that can influence multiple other objectives. It is therefore interesting to note that selection and award criteria can either directly influence end-objectives like sustainability, or indirectly by focussing on either the learning curve, or collaboration, or both. These relations are depicted in figure 4-8.

Figure 4-8 - System diagram, selection and award criteria (made by author using Miro)



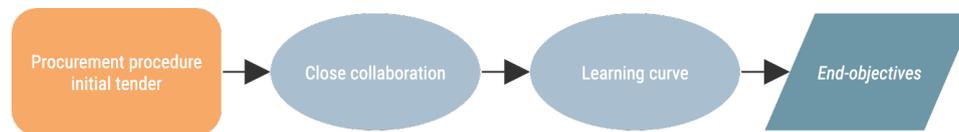
#### Procurement procedure initial tender

In most cases, the procurement procedure is considered as a logical consequence of procurement law. Nevertheless, it is mentioned fifteen times in seven interviews, out of which one clear consideration can be extracted. In general, a CPA contains a longer-term partnership between clients and market parties. This creates the need to take more time for the procurement process, because client and contractor need time to define this collaboration. Moreover, it also creates the opportunity to do this, since multiple procedures are substituted by one, so more time can be spend on this single procedure. With this in mind, a clear tendency of clients away from classical procedures towards more collaboration based procedures like the competitive dialogue can be noticed. One respondent mentions that a competitive dialogue was absolutely required for the CPA to succeed, because only at the end of this dialogue, the contractors were up to speed on the ambition of the portfolio and what it entails to participate in a CPA. This is substantiated by another respondent, claiming that a normal open procedure was used in their case, about which they received negative signals from the market.

As will be explained later in this chapter, complexity of the individual works influences the way in which this choice option is used. If the complexity is low, procurement without a CPA would probably not be done with a competitive dialogue. In these cases, the mere fact that a CPA is

implemented, creates the need for a different view on the procurement procedure. On the other hand, a respondent explains that with their limited amount of complex works, the competitive dialogue is their standard procurement procedure, and the CPA does not have influence on this.

Figure 4-9 - System diagram, procurement procedure (made by author using Miro)



#### *Collaborative aspects in the tender procedure phase*

Collaborative aspects differ per phase of the construction process. In the tender procedure phase, it constitutes of collaboratively defining the task that lays ahead and eliminating possible risks and uncertainties. In this regard, aspects like uncertainty and knowledge of the task determine the way in which this collaboration is shaped. This closely relates to the chosen procurement procedure, and shows the same dynamics in the system.

#### 4.4.2. Options influencing the execution phase

This part describes the options that play a role in the execution phase.

#### *Legal form*

As described in the theoretical framework, there are three legal ways in which a CPA can be implemented. The revision clause is not chosen in any of the cases and will therefore not be taken into account in this chapter. Since the number of contractors is a separate choice option, this paragraph only focusses on the framework agreement in comparison with the repeat order.

The legal form is mentioned sixteen times in eight interviews. Four cases use one or multiple framework agreements, and two use repeat orders. It is important to note that multiple respondents describe the choice for a certain legal form as more of a practical one, rather than one that can be linked to the objectives. In multiple cases, other legal forms were not even considered as viable options, and in cases where it was considered, the main consideration was the limitations coming from procurement law, rather than certain objectives. This makes it unfeasible to visualise the relation with the system by means of a system diagram. However, the choice for a legal form can be linked to situational factors, which will be defined later in this chapter.

#### *Collaborative aspects in the execution phase*

Collaborative aspects form an important choice for clients in a CPA, since CPA inherently entails longer-term collaboration. This is displayed by the relevance it has during the interviews. Collaboration is mentioned 38 times in eight interviews, mostly related to the execution phase, and is often considered as a determining factor for reaching objectives. This does not mean that every case entails a very close form of collaboration. The intensity of the collaboration depends on whether the client pursues this, and is therefore related to its objectives. Certain aspects of collaboration, however, show a positive effect on the effectiveness of the portfolio.

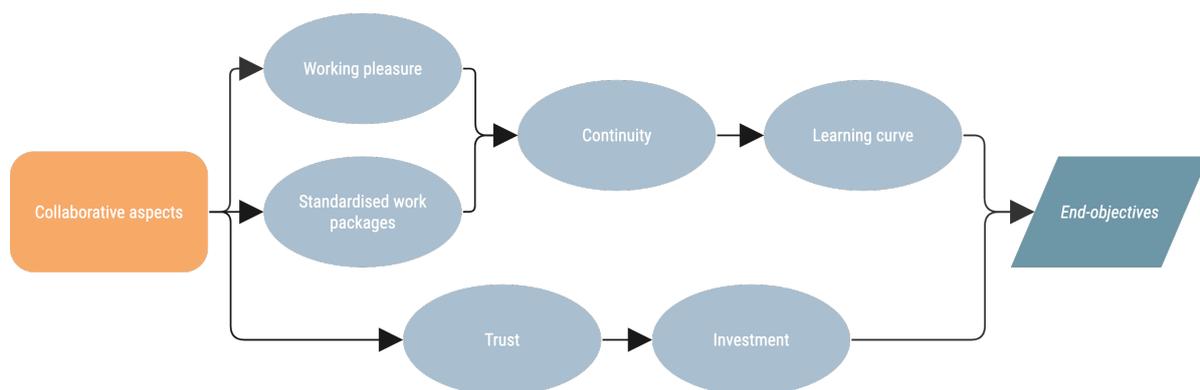
In some cases, clients choose for a very collaborative CPA, while other clients aim at keeping a certain distance between them and the contractor. For the collaborative cases, contractors can be selected on the basis of their suitability to work together, but this has to be safeguarded throughout the process. This choice option describes how collaboration can be shaped in such a way that a healthy way of working together is reached that fits to the objectives of the client.

In the execution phase specifically, collaboration entails a joint effort to achieve the desired end-product, and includes the chosen contract form, in combination with 'softer' aspects. For instance, a respondent mentions that well-established collaboration can lead to an increase in working pleasure, which in turn motivates individuals to stay committed to the portfolio. This continuity of individuals enhances the learning curve in the portfolio. Moreover, a respondent states that instead of taking on a lot of design responsibility, drafting the specification and limiting the contractor to only execution, a CPA works better if design is done in a collaborative manner. One specific benefit this respondent mentions, is the fact that in this way, the contractor in the portfolio is always provided with a constant workflow, which enables him to assign a fixed project team to the portfolio. This on its turn, creates the same continuity as the working pleasure that is previously mentioned. If the client drafts the specifications itself and encounters setbacks in doing so, this phase takes longer than expected, and gaps will occur in the workflow of the contractor. Another respondent mentions another benefit, which is the fact that collaboration creates a certain trust between parties, which in his case resulted in the willingness of the contractor to invest a lot in the portfolio.

To translate this collaboration to the collaboration between individuals, collaboration assessments can be performed in order to align the collaborative attitudes of specific persons. Respondents explain that this is done on the basis of roles or profiles rather than persons, in order to maintain this collaborative character if individuals leave the portfolio. Moreover, in order to maximise the learning potential of a CPA, respondents underline the importance of focussing on how a contractor of a certain work can be collaborated with for the upcoming works. As one respondent explains, CPA provided them with the opportunity to work together with the contractor that performed the initial work, for the preparation of the secondary work. Another respondent mentions that the contractor of the first work is involved in the financial estimations of the secondary work.

As a last aspect, collaboration between contractors in CPAs with multiple contractors is mentioned multiple times by the respondents. In one case for example, they managed to successfully create a central database for designs, where all contractors could learn from each other. This respondent also mentions that they had to actively stimulate the contractors to do this, because contractors are by nature reluctant to share this kind of information for competitive reasons.

Figure 4-10 - System diagram, collaborative aspects (made by author using Miro)



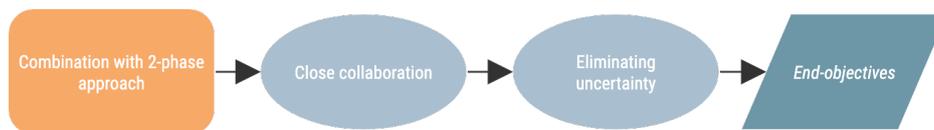
### Combination with 2-phase approach

Combining CPA with a 2-phase approach is only mentioned eight times in five interviews. In two cases, the respondents define their approach as a 'building team' approach, which can be seen as a form of the 2-phase approach. Obviously, the 2-phase approach can be chosen regardless of the implementation of a CPA. However, respondents state CPA and the 2-

phase approach form an interesting combination, since the bundling of objects increases the complexity of the task. This on its turn increases the need to take enough time to look at the first phase of the process in a collaborative manner. One respondent underlines this theory by stating that the building team approach takes long to organise, but once it is in place, it can be efficiently used in multiple works. Furthermore, another respondent states that the building team approach they implemented, could not have been implemented without a CPA, because this would require too much of their internal capacity.

Choosing a 2-phase approach becomes increasingly relevant if the complexity of the portfolio is large. This can either be because of the complexity of individual works or their environment, or because the complexity arises when a large amount of works is bundled in the portfolio.

Figure 4-11 - System diagram, comb. with 2-phase approach (made by author using Miro)



### Performance management

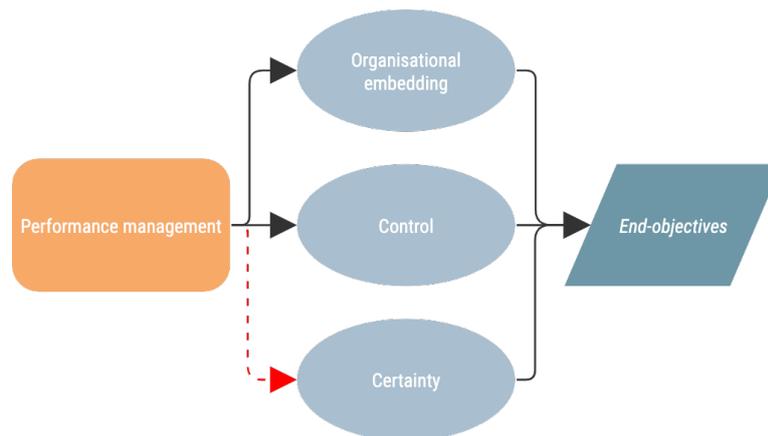
Performance management is mentioned 26 times across eight interviews. In general, performance management is considered as a logical choice within a CPA, since it enables the client to measure performance over multiple consecutive projects and assign consequences to these measurements. Multiple respondents mention that CPA enabled them to construct certain KPIs on the basis of their objectives, and incentivise contractors to adhere to these KPIs. For example, in order to improve sustainability, multiple respondents mention the implementation and measurement of the Environmental Cost Indicator (ECI) during the portfolio. Another respondent mentions that the performance of the contractor regarding efficiency was being managed. Respondents state that this especially renders desired results if direct consequences can be attributed to the measurements. For example, in one case, multiple contractors were part of a framework agreement, within which the distribution of tasks could be adapted on the basis of their performance. Moreover, in multiple other cases with framework agreements, an extension option was incorporated in the contract, which enables the client to determine whether the contractor can perform the extension as well.

This direct effect of creating a certain control over the project is not the only effect it can have. Indirectly, performance management can be used to display the benefits of the approach and to communicate this with the rest of the organisation. In this way, performance management is supportive to the organisational embedding as described later in this section.

However, whether and how performance management is incorporated in a CPA, highly depends on the objectives of the client and the type of CPA from the viewpoint of situational factors. As mentioned by multiple respondents, with CPAs focussed on collaboration, performance management is not required and not even desirable, since the objectives are reached with collaboration instead of hard requirements. Moreover, with complex works in complex environments, it is very difficult to compare the different works and therefore very hard to measure performance. Because the throughput time in these situations is large, even if performance can be measured, it is very difficult to assign consequences to these measurements. As is mentioned by a respondent, performance management only works if the work packages are small and standardised. As a last determining aspect, respondents mention that choosing for a repeat order increases the need for performance management compared to a framework agreement, since the possibility to select and award on the basis of portfolio objectives is limited.

Especially interesting is the emergence of a clear dilemma with which the client is confronted when considering the implementation of performance management. This is a dilemma between controlling the quality by means of performance management on the one hand, and certainty for the contractor on the other. With performance management, contractors can be stimulated to perform better. However, this strategy also entails the possibility for the contractor to be removed from the project due to bad performance, which decreases the certainty or predictability for this contractor. This certainty is another determining factor for the performance of the contractor, since it incentivises him to invest in the portfolio. In figure 4-12, this dilemma is clearly depicted.

Figure 4-12 - System diagram, performance management (made by author using Miro)



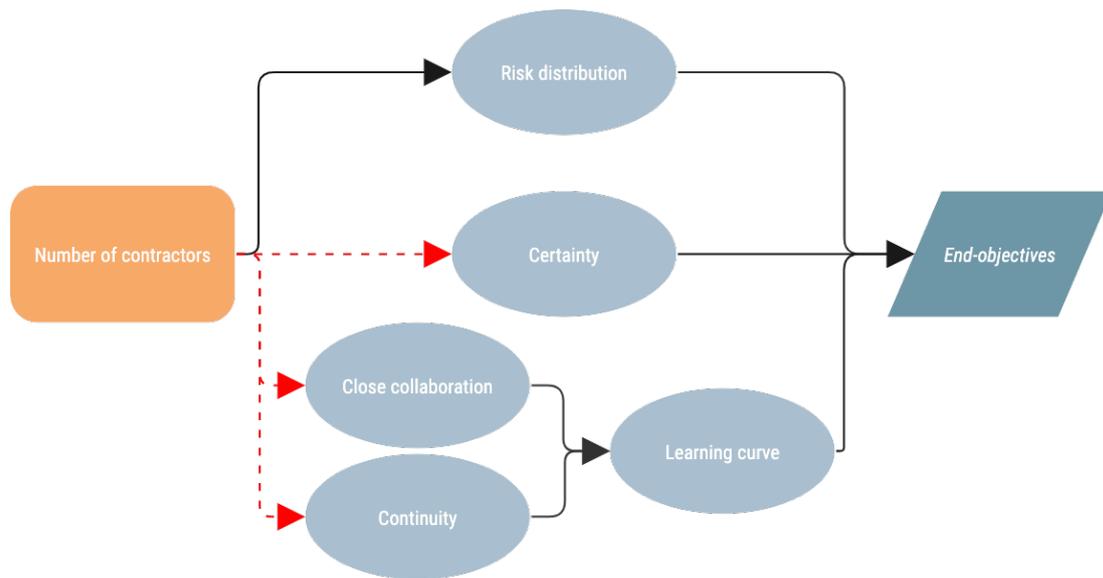
### Number of contractors

The number of contractors is a choice option that specifically becomes apparent in cases of framework agreements, as procurement law allows for both single and multiple contractors to be included in these agreements. In case of a repeat order or a revision clause, this choice cannot actively be made.

The number of contractors is mentioned as a consideration sixteen times, across the eight interviews in which a framework agreement is used. The capacity of the assigned contractors is a key factor in determining the number of contractors according to the respondents. Obviously, if the task that has to be performed is too large for one contractor, multiple contractors are required. On the other hand, having too many contractors in the portfolio can result in smaller work packages that may not be attractive for the contractors. As one respondent mentions, the task for one contractor has to be big enough for him to be incentivised to make investments. Moreover, a respondent explains he was being informed by a contractor about the benefit of assigning a project team to work fulltime on the portfolio, which is only possible if there is enough work.

Apart from this, the choice between one or multiple contractors is one of risk distribution versus close collaboration. With one contractor, the client is completely dependent on this contractor, meaning that if this contractor goes out of business, a new procurement process has to be started. Moreover, this single-contractor situation increases the complexity of pricing, since the lack of competition puts the contractor in a position of power. In case of multiple contractors, the portfolio can still proceed if one contractor has financial problems, and as one respondent mentions, competition and performance management can make sure the contractors do not become 'lazy'. The large benefit of one contractor however, is the potential closer collaboration it can create. Client and contractor are in a one-on-one relation, which enhances information sharing and trust. Moreover, one respondent mentions that having one contractor creates a certain assurance for the contractor, which incentivises him to invest.

Figure 4-13 - System diagram, number of contractors (made by author using Miro)



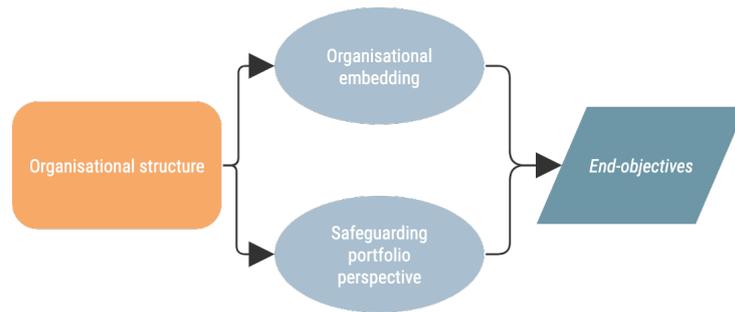
### Organisational structure

Compared to other options, there is not a large variety of considerations regarding the organisational structure that came up during the interviews. The choice option is referred to fifteen times in seven interviews, but always in the context of whether or not to install an overarching portfolio team.

Multiple respondents underline the fact that objectives on a project level can be conflicting with longer-term portfolio objectives. A respondent gave an example where a project manager wanted to use a certain material because this fitted best to the specific project. However, from a portfolio perspective, uniformity was one of the main objectives. This made a material that was sub-optimal for this work, but that could be implemented in every work, more logical to choose. Keeping in mind these overarching objectives is very difficult without an overarching team. As another respondent puts it, "if you are working on a project, you get stuck in the delusion of the day and forget about the long term". An additional benefit of having a portfolio team that is mentioned, is that it helps with embedding the portfolio in the rest of the organisation. It is important to specifically assign the task of communicating with other parts of the organisation to this team.

So, as figure 4-14 shows, a multi-level organisational structure can lead to reaching end-objectives, since the team on the portfolio level is able to safeguard these objectives. Next to this, it enables a better organisational embedding, which leads to reaching end-objectives as well.

Figure 4-14 - System diagram, organisational structure (made by author using Miro)



### Way of awarding secondary works

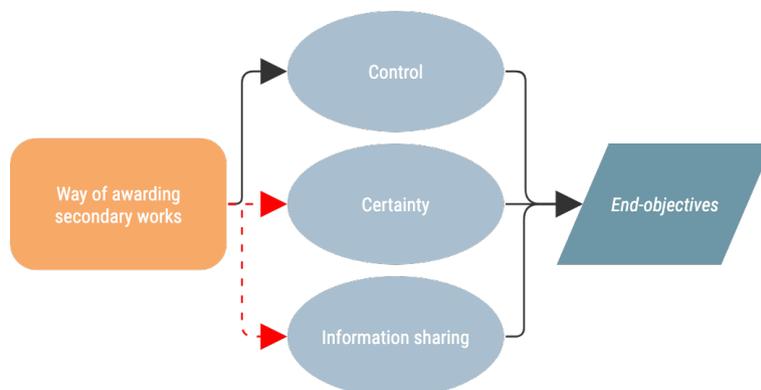
In the cases where repeat orders are chosen, the way of awarding secondary works is not discussed very thoroughly during the interviews. It is logical that the performance of the contractor during the initial work is measured, in order to determine whether this contractor meets the requirements of being awarded with the secondary works. How exactly this is done, cannot be derived from the interviews. However, in a framework agreement with multiple contractors, this choice is made explicit by multiple respondents.

As one respondent explains, they considered a carousel, in which contractors take turns after one another, performance management, in which the allocation of works could be adapted on the basis of performance, and a mini-competition, in which contractors have to compete for the works every time. Often, however, a hybrid form is chosen which entails measuring performance, but only assigning consequences to it if a contractor performs below a certain minimal value.

Regarding the awarding of secondary works, one clear consideration can be made. On the one hand, a client can choose to stimulate contractors by installing a certain form of competition. With this, 'the market' incentivises the contractors to strive for the best. However, this way of working largely limits the willingness of parties to share information. Another strategy would be to give certainty to the contractors, which creates a situation in which they are able to share information and to make investments in an early stage.

With the way of awarding secondary works, the same dilemma as with performance management can be displayed, which is the one between control and certainty, as shown in figure 4-15.

Figure 4-15 - System diagram, way of awarding secondary works (made by author using Miro)



### Composition of bundling

The composition of bundling might be the most apparent choice option within a CPA. Moreover, it is inherently a choice that is made with the CPA at its basis, since without a CPA, this bundling would not have been done. This results in 77 quotations during the interviews, spread over all interviews.

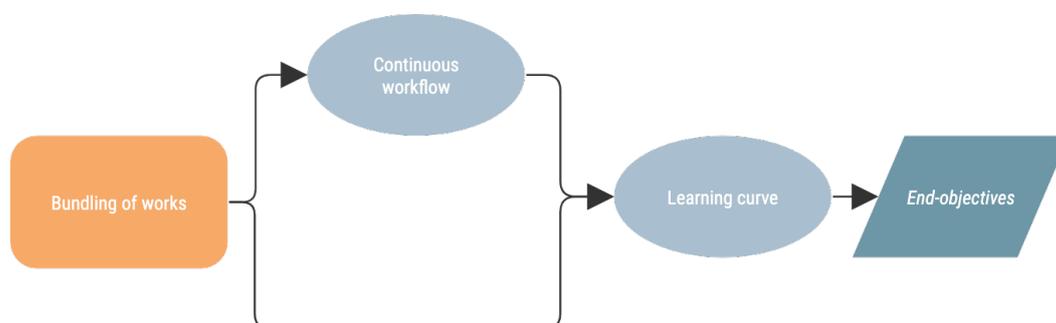
This option handles the question how bundling is done within a portfolio, which has two aspects in it, the bundling of works in the portfolio as a whole, and the bundling of elements in a work.

### Bundling of works

For the bundling of works, multiple respondents mention the logic of bundling works that are in some way similar or comparable. In this way, both client and contractor can actually learn throughout the portfolio, since they encounter similar situations multiple times. Next to that, another logical aspect is urgency. Respondents explain that bundling is performed in such a way that the urgent works are performed in a timely manner, while less urgent works can be done in a later stage. Another consideration focussed on the order of works, is the fact that relatively simple objects are started with, to enable both client and contractor to learn from this and apply these lessons learned to the next, more complex, object. In one case, this even entailed the execution of a work outside of the portfolio. This was not done with the goal of learning from it in mind, but the respondent did state that this helped them to learn and start with the portfolio in a better way. This is substantiated by another respondent, who claims that in hindsight, they did not have enough information at the start of the portfolio and started off with it too quickly. Another aspect that emerges from the interviews, is the amount of works that are being bundled. On the one hand, it is important to align this amount to the capacity of both the internal organisation and the market. Therefore, it is important to limit the size of the portfolio to some extent, and to make sure there aren't too many works bundled in such a way that they have to be executed at the same time. On the other hand however, the aspect of a continuous workflow comes into play. As mentioned before, it is important that there is enough work in the portfolio, so that the contractor has a continuous workflow and can assign a permanent team to the portfolio.

So, a certain bundling of works can lead to an increased learning curve, because a simpler object is for example done first. Next to this, with the right amount of works in a portfolio, a continuous workflow can be created, which stimulates a learning curve as well.

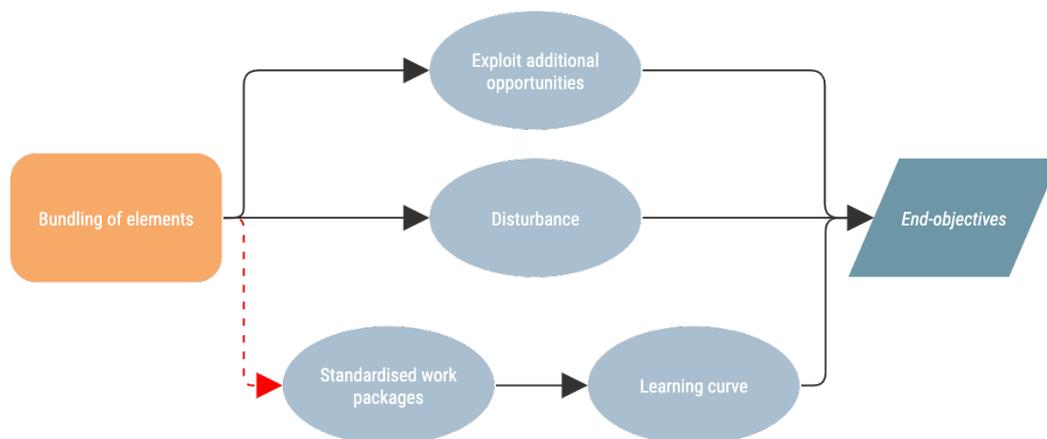
Figure 4-16 - System diagram, bundling of works (made by author using Miro)



## Bundling of elements

This last notion creates the link with the second way of bundling, which is that of elements within a work, in other words, the scope of an individual work. Similar to the bundling of works, the continuous workflow is an important aspect in this context. For this form of bundling, it comes with an interesting dilemma. On the one hand, limiting the size, complexity and the amount of extra elements in one individual work leads to a continuous workflow. As one respondent formulates it, there should be an “assembly line with standardised work packages, with a constant flow of these packages”. However, this diametrically opposes the notion of ‘making work with work’, as mentioned by several respondents, meaning that chances to perform additional beneficial task within the portfolio should be exploited. Moreover, expanding the scope per work can also be justified from the perspective of disturbance. If an important bridge in a busy area needs renovation, one would want to limit its closure time. If multiple tasks are performed in one period of closure, this minimises disruption compared to performing every task in a separate window. The extent to which elements are bundled per work, could depend on the objectives the client has. For example, a respondent mentions that efficiency and a limited throughput time were important objectives, which lead them to the choice of limiting the scope per work. However, there is another way of dealing with this dilemma that is mentioned multiple times. This is in some way separating the extra opportunities from the basic flow of works. One respondent for example refers to this as the “throwing over the fence procedure”, meaning that if a work is too complex, it is extracted from the portfolio and performed in a project-based manner. In another case, the client identifies works with a high potential for sustainable innovations as ‘special works’, treating them separate from the stream of the portfolio.

Figure 4-17 - System diagram, bundling of elements (made by author using Miro)



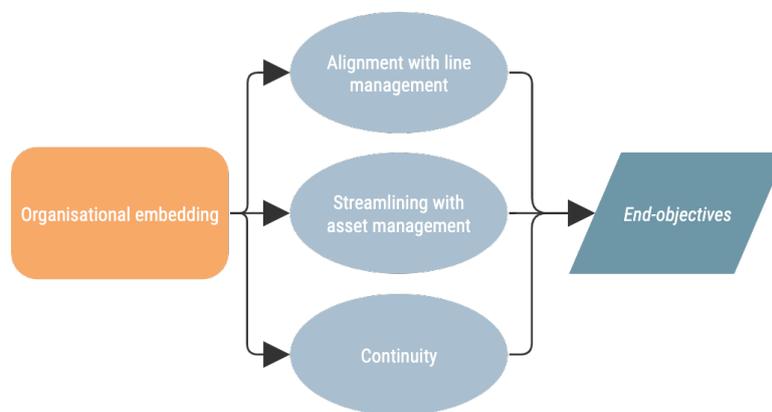
## Organisational embedding

The organisational embedding is considered as an important aspect by multiple respondents. It is mentioned 33 times in eight interviews. In one of the cases, a respondent explained that the portfolio was initiated by a line manager, which made it relatively easy to embed the portfolio in the organisation. In the same way, another respondent mentions that the board of both the client and the contractor always supported the portfolio, which facilitated focus on the objectives on the portfolio level. However, opposed to this, respondents explain situations in which the organisation was not automatically invested. In these cases, there is a need for actively managing this organisational embedding. A respondent mentions that this is done by actively showing the benefits of the portfolio to the rest of the organisation. Interesting and important figures like production rate are measured and communicated with the organisation, showing the usefulness of such an approach. Another respondent states that a CPA can only be successful if the portfolio objectives are either derived from organisational ones, or actively aligned and coordinated with the organisation. This alignment is not only important to

communicate the added value of the approach. As mentioned previously, some form of continuity in the portfolio is important as well. If this cannot be safeguarded in the form of individuals, ambitions and objectives can be embedded in the organisation. If this is done properly, persons leaving the portfolio does not mean portfolio ambitions disappearing with them.

Another aspect of organisational embedding, is the alignment of the portfolio with the parts of the organisation that are responsible for the regular activities on the objects. In most cases, this is an asset management department that performs the management and maintenance of the structure in a 'normal' situation. With the renovation or replacement task, these objects are temporarily transferred from this part of the organisation to the portfolio, and after the portfolio is finished, they are transferred back. Multiple respondents state that this alignment should be performed in an active manner. One respondent explains that they focussed on 'blurring' the boundaries between these different parts of the organisation by involving employees from the asset management department in the portfolio and taking their demands into account.

Figure 4-18 - System diagram, organisational embedding (Made by author using Miro)

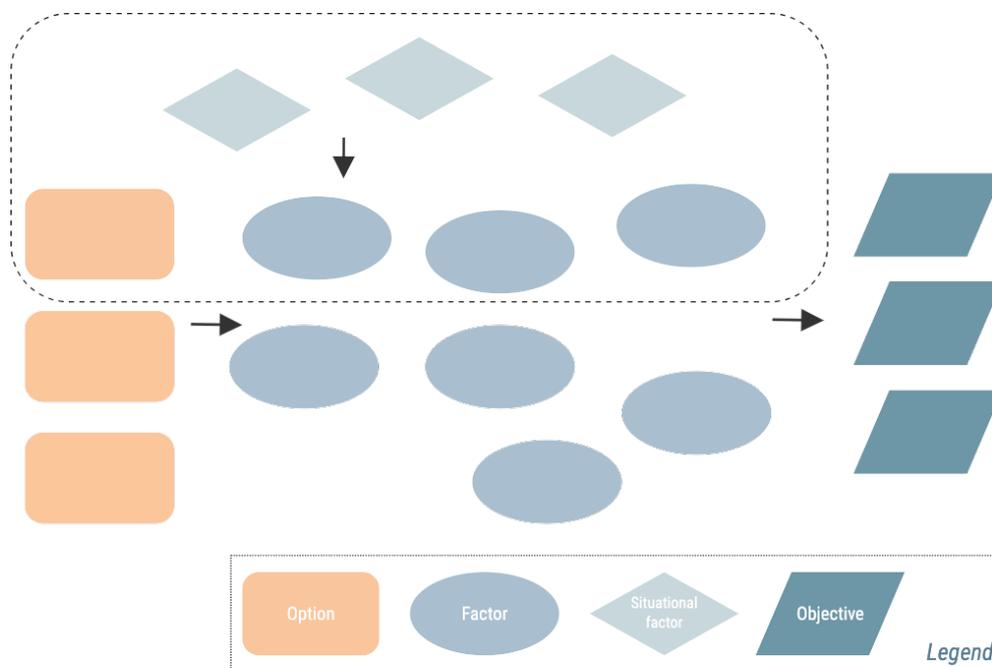


## 4.5. Situational factors

Not everything can be controlled with choices. On the contrary, there are certain situational factors that can be taken as a given, since they cannot be influenced by the client from the perspective of the chosen scope. When looking at the bigger picture, clients might be able to influence these factors. However, with research comes demarcation, so factors that are considered by the respondents as factors that exist in the context, rather than in the system that can be influenced, they are taken into account in this section as situational factors. This viewpoint is depicted in figure 4-19.

Five situational factors emerge from the interviews. These five factors, being complexity of the works, complexity of the environment, knowledge of the task, readiness of the organisation and urgency of the situation, are described in subsequent subsections. This description is accompanied by an explanation of how they influence the system, with specific focus on their relation with the choice options.

Figure 4-19 - System diagram, situational factors perspective



### 4.5.1. Complexity of the works

The first situational factor is the complexity of the individual works. The interesting effect complexity of the works has, as explained by respondents, is that a high complexity results in the CPA situation being relatively similar to the situation without the implementation of a CPA. In these cases, combining multiple works in a portfolio does not add much extra complexity, since the inherent complexity is already high. On the other hand, when dealing with relatively simple objects, the bundling of works introduces complexity. This incentivises clients to make different decisions on the basis of the complexity created by the implementation of a CPA. For example, a respondent explains that a competitive dialogue is considered as the standard procurement procedure in his organisation, since they mainly work with large and complex works. In contrast to this, another respondent states that the implementation of a CPA created the need for more collaboration and information exchange in the procurement process, which made them follow a competitive dialogue. Next to this, complex works with long throughput times impose challenges on the implementation of performance management. The works are less comparable, and because of the duration, evaluation of the performance and assigning consequences to this can only be done after a long time. This indicates that in

cases with a high complexity of the works, more collaborative types of CPA are better suited. In such collaborative CPAs, choices like combining CPA with a 2-phase approach are more logical to make.

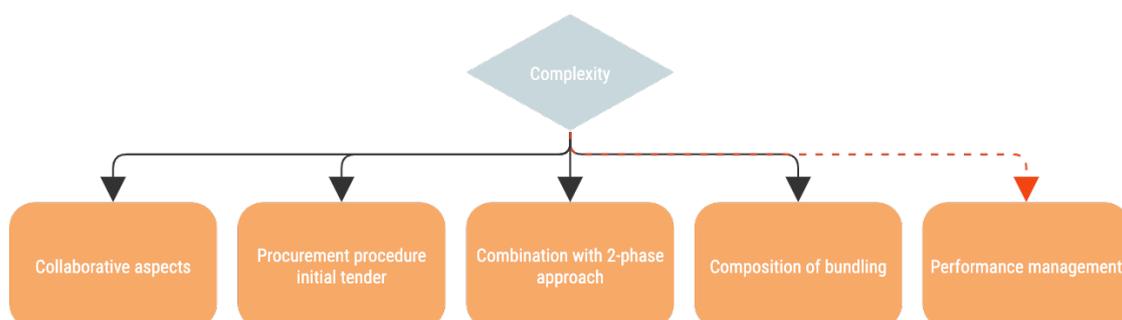
#### 4.5.2. Complexity of the environment

Next to the complexity of the works themselves, the complexity of the environment in which the works are situated are considered as an important situational factor as well. It is often mentioned that for a CPA to function well, the creation of manageable and relatively small packages of work is crucial. This is needed in order to safeguard a constant workflow and to maintain the similarity of the works. Respondents mention that achieving this becomes challenging in a complex environment. As an example, the renovation of a quay wall might be the original task of the portfolio. If, however, there is a jetty attached to this wall that is in bad shape as well, it might be useful to include this jetty in the renovation task. This increases the scope of an individual work, and comes with the downside of endangering the throughput of the portfolio. In less complex and more isolated situations, these considerations occur with a lower frequency, which makes it easier to safeguard the constant flow of work. Moreover, a complex environment often involves an interconnected system where disturbance has a lot of impact. In this sense, environmental complexity shows an additional effect on the composition of bundling, being that clients are even more incentivised to combine multiple elements in the works.

Next to that, interview results show that this complexity influences the effectivity of performance management as well. A respondent explains the intention to measure the performance of his contractors, but encountered difficulties in comparing works in different environments. Achieving objectives 'in the middle of nowhere', turned out to be a lot easier than in a dense and complex environment. Moreover, a high complexity of the environment means that every work comes with complications that influence the workflow of the portfolio. In order to safeguard continuity without a standardised workflow, and to secure quality without performance management, a complex environment asks for a more collaborative form of CPA.

This subsection started with the notion that a low complexity of the individual works amplifies the differences between a CPA situation and a 'normal' situation. Apart from this, both types of complexity have the same effect on the rest of the system. Figure 4-20 illustrates this effect.

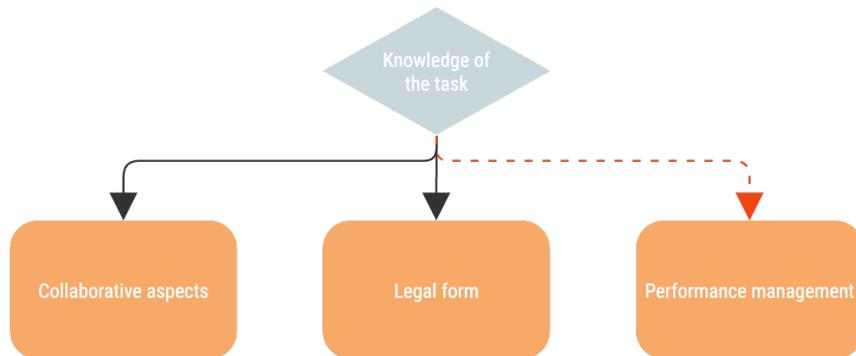
Figure 4-20 - System diagram, complexity (made by author using Miro)



#### 4.5.3. Knowledge of the task

In some cases, the knowledge of the upcoming task is very limited. In these situations, respondents explain that a CPA is implemented as a means to bundle a relatively unknown set of works and to use this portfolio as a way to further explore and define the task. Respondents point out that a framework agreement is a more logical choice in these cases, as it allows entering into an agreement without precisely defining the works that need to be executed. As with complexity, of limited knowledge of the task hampers the creation standardised work packages and complicates performance management. Therefore, limited knowledge of the task incentivises clients to choose a more collaborative CPA.

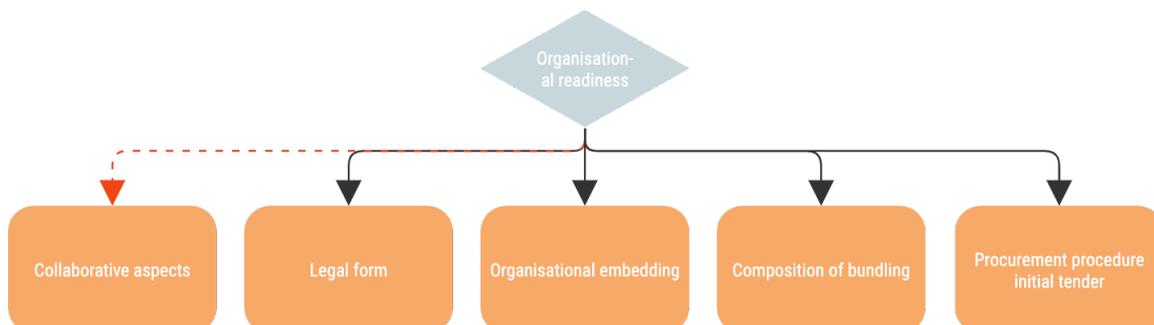
Figure 4-21 - System diagram, knowledge of the task (made by author using Miro)



#### 4.5.4. Readiness of the organisation

As another situational factor, the respondents highlight the significance of organisational readiness. Respondents use this term to describe the extent to which employees within an organisation are accustomed to working with new approaches like the CPA. In cases where the organisation is more oriented towards classical contract forms and client-contractor relations, new approaches are perceived as a significant barrier. If this organisational readiness is low, a moderate form of CPA is more logical, which means making choices regarding the procurement procedure, legal form and degree of collaboration similar to how projects are normally handled in the organisation. Next to that, respondents emphasise the importance of bundling by prioritising simpler works and build up towards more complex works throughout the portfolio, and of extra focus on organisational embedding in order to involve the whole organisation.

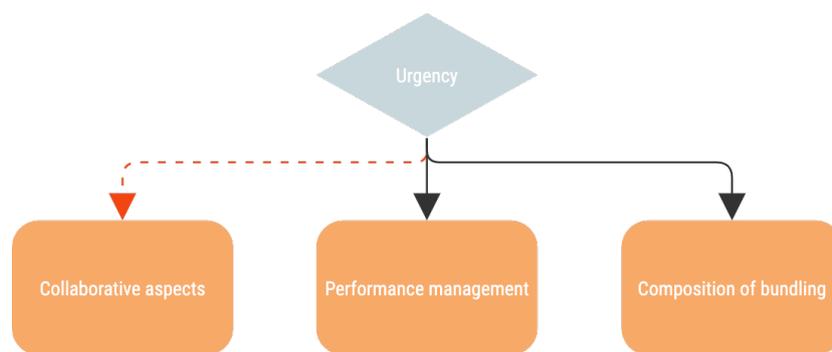
Figure 4-22 - System diagram, organisational readiness (made by author using Miro)



#### 4.5.5. Urgency of the situation

The final situational factor that can be extracted from the case study is the urgency of the situation. In all cases, the respondents describe the level of urgency and its relation with certain choices. High urgency is often characterised by objects being in a bad shape, or a large number of objects requiring renovation within a limited timeframe. In such scenarios, there is often no time to think twice about choice options, and short-term needs prevail over longer-term objectives. Often, ambitious long-term objectives like sustainability and standardisation are being formulated, but turn out to be overlooked because of the urgency of the situation. Respondents mention that as a result of this urgency, the scope per work is limited in order to safeguard a high production rate and a continuous workflow. Often, a high urgency hampers the development of a close relationship between client and contractor since there is not enough time to set this up together. This indicates securing quality by means of performance management or installing a form of competition, as alternative for what collaboration can bring.

Figure 4-23 - System diagram, urgency (made by author using Miro)



#### 4.6. Validation through expert judgement

In appendix E, the report of the expert validation session is available. This paragraph describes the main findings of this session, which will be used to refine the interpretations, to review the conclusions and to make better recommendations for clients in the sector and for further research.

##### 4.6.1. Definition and positioning

Firstly, regarding the definition and positioning of the term CPA, the experts endorse the definition and the different elements it contains. They state that the real-life cases they encounter fit in the formulated definition. They specifically underline the importance of the second part of the definition, meaning that one can only speak of a CPA if the aim is to reach certain objectives. If one of the legal forms of CPA is used without these objectives, it is merely a practical matter, and it cannot be defined as CPA.

They do dispute the term 'project-transcending'. The focus on objectives that transcend individual objects is recognised, but they state that a project is a way in which something can be organised, but not every CPA consists of projects.

Moreover, they note the fact that service contracts are being excluded because of the term 'works'. They claim to understand this decision, but that in real-life, service contracts can be CPA as well.

##### 4.6.2. Objectives

The experts recognise the notion that having too many objectives can be a pitfall for the CPA.

They understand collaboration as an objective, but question whether it is actually an objective or more of a means to reach other objectives.

#### 4.6.3. Choice options

The experts recognise the different available choice options. They mention pricing as an important addition to the list, because this is something that plays a large role in real-life cases. Next to that, they note that the choice options often differ per legal form. As a specification of this, they note that with framework agreements, the focus can be more on the award criteria of the initial tender, whereas repeat orders tend to be more focused on performance management.

Next to this, they specifically state that collaboration, both between client and contractor and among contractors, is something for which clients can explicitly choose. They do not recognise collaboration as an inherent part of CPA.

They mention the way of bundling as an important choice option, and state that this can be seen from a broader perspective as well, for example by considering the addition of regular maintenance to the portfolio.

The three main dilemmas are all recognised by the experts. For the one between performance management and predictability, they state that they view it more as a dilemma between conditions and assurance. For the dilemma between a continuous workflow and exploiting additional opportunities, they specifically state that this is a hot topic in the market. They do state that from a portfolio perspective, clients always strive for the continuous workflow.

#### 4.6.4. Situational factors

The situational factors are being recognised as having an influence on the CPA. Next to the ones that are presented, the capacity and quality of the market is added as a last situational factor.

For CPAs in a complex environment, the experts recognise that this complexity hampers the creation of standardised work packages. However, for complex objects, they see examples where standardised work packages are being created out of complex objects.

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## CONCLUSION

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The following chapter presents the conclusions of the conducted research. This is done by firstly answering the different sub-questions and then combining the information from the sub-questions to formulate an answer to the main question. After this, some short final remarks are made.

To start, the first sub-question of this research is the following:

*SQ1: What characterises a contractual portfolio approach compared to similar approaches?*

The first step in the characterisation of the term contractual portfolio approach consists of the formulation of a definition. On the basis of both literature and interviews, the following definition is formulated:

*The bundling of a logical set of similar works into one initial tender, with the purpose of reaching certain work-transcending objectives.*

From this definition, certain characterising elements can be extracted. To start, the contractual portfolio approach revolves around bundling. This means that multiple works are grouped or combined together. A situation with only one work or multiple works without any grouping, is not defined as a CPA. Then, CPA entails the bundling of a logical set of similar works. The term 'Works' is used because the individual aspects that are being bundled are not services, and do not always constitute a single object. 'A logical set of similar' works because CPA is only done when bundling can be performed on the basis of some logical similarity. Furthermore, 'into one initial tender' means that CPA is a form of procurement, where multiple works are bundled in this first tender. In this, 'initial' presents the nuance that within a CPA, multiple tenders can be done when the secondary works are for example procured in a mini-competition. Despite this, there is always one initial tender in which the works are originally bundled. The last aspect, 'with the purpose of reaching certain work-transcending objectives', emphasises that CPA is implemented in order to reach certain objectives that surpass individual works. By creating a portfolio level and procuring in a bundled manner, these work-transcending objectives can be accomplished.

Furthermore, certain distinguishing factors compared to similar approaches can be identified that align with the previously defined definition. Compared to the programmatic approach and the general 'portfolio approach', without the 'contractual' part in it, it can be concluded that CPA is a procurement method, while the others can be merely an internal approach. Moreover, CPA can be viewed as a more specific strategy in comparison with the programmatic approach or the portfolio approach. This also means that a programmatic or portfolio approach can consist of multiple CPAs. Then, there are approaches that function on the same 'level' as the CPA, but with different objectives or in different contexts, and more narrowly demarcated approaches, like performance management, which can be seen as a choice option within a contractual portfolio approach.

Now that the definition and position of CPA is defined, the second sub-question can be answered. This question is aimed at the objectives of clients, and dictates as follows:

*SQ2: What are the objectives pursued by clients when adopting the contractual portfolio approach?*

The initial conclusion regarding objectives that can be drawn is that with the implementation of a contractual portfolio approach, clients pursue an extensive set of objectives. The case study rendered a total of 26 objectives, and a significant part of these objectives were mentioned consistently across all cases. This diversity can lead to a lack of focus, as attention has to be diverged over multiple objectives. To create structure in this extensive set of objectives, specific objectives are bundled into overarching ones and objectives that are mentioned infrequently are eliminated, leading to the following eight main objectives:

- > Enhancing standardisation and uniformity
- > Enhancing sustainability and innovation
- > Increasing certainty and stimulating investment
- > Increasing efficiency
- > Reducing risk
- > Safeguarding continuity
- > Stimulating a learning curve
- > Stimulating closer collaboration and information sharing

It can be concluded that these objectives are interconnected. Some are end-objectives, whereas others are serving for the attainment of these end-objectives. Therefore, certain ones, like continuity and learning curve, influence each other in a positive way, whereas others, like efficiency and sustainability, contradict each other to some extent.

Then, the last sub-question aims at defining the options clients have within a CPA:

*SQ3: What are the available options for clients within the context of the contractual portfolio approach?*

In this research, a set of eleven options is defined.

#### 1. Selection and award criteria initial tender

Selection and award criteria in a tender are always based on the objectives a client has. However, in a CPA, these criteria enable the client to select the contractor that is able to incorporate the longer-term portfolio objectives in his proposal. Moreover, these criteria can be used to select on the basis of the capability to execute the whole volume and range of works within the portfolio, and because of the longer-term character of CPA, selection and awarding can be done on the basis of collaboration.

#### 2. Performance management

Performance management can be used to incentivise the contractor in the portfolio to perform well. CPA specifically enables the client to manage the performance over multiple works, which increases the effectivity of performance management. By constructing KPIs, the client can measure the performance of the contractor and assign consequences to these measurements.

#### 3. Legal form

A CPA can be constructed by means of three legal forms, being the framework agreement, the repeat order and the revision clause. Every form comes with certain legal limitations. Therefore, certain situations ask for a certain legal form. For example, in cases with limited knowledge of the task that lays ahead, a framework agreement is more useful since this does not require the client to exactly define the task.

#### 4. Collaborative aspects

The way in which the collaboration between client and contractor is designed forms an important part of the CPA. Because of the longer-term character, CPA always requires extra focus on collaborative aspects. However, the extent to which this is needed differs per situation. Aspects that can be thought of in this context are client-contractor collaboration in the design phase, involving the contractor of the first work in the design of the second, and mutual collaboration between multiple contractors. A large part of this is reflected in the contract form that is used.

#### 5. Number of contractors

In a framework agreement, the client can determine the number of contractors eligible to enter the agreement. It is important that the number of contractors in principle fits to the capacity that is needed to fulfil the task. An adequate number of contractors in order to have enough capacity, without an excessive surplus that might result in an insufficient workload for each contractor.

#### 6. Organisational structure

The organisation of the portfolio on the client side can be structured in various ways. An important consideration in this regard is the formation of an extra team on the portfolio level, in order to safeguard objectives that play a role on this level.

#### 7. Combination with 2-phase approach

The CPA can be combined with the 2-phase approach, for example in the form of a building team. Per CPA, it can be considered whether these approaches add value to the CPA or not.

#### 8. Procurement procedure initial tender

Assuming that all CPA cases involve a large contract sum, the client can choose one of the procurement procedures as prescribed by procurement law. A consideration can be made between more collaborative procedures on the one hand, and more classical ones on the other.

#### 9. Way of awarding secondary works

Secondary works can be awarded in a multitude of ways. They can be assigned randomly to the contractors in the portfolio, on the basis of a certain logic or measured performance, or with a mini-competition.

#### 10. Composition of bundling

The composition of bundling can be divided into two aspects. Firstly, the works in a portfolio can be bundled in several ways. This relates to the amount of works, the order of these works and which works are bundled. Secondly, the amount of elements that is bundled per work, or in other words, the scope of the individual works, is an important consideration as well.

#### 11. Organisational embedding

Organisational embedding entails safeguarding a certain connection between the portfolio and the rest of the organisation. Two aspects that the client can focus on, are aligning works with the asset management department, and communicating the relevance of the approach with the line-management.

Answering all the sub-questions and combining these answers, paves the way for the formulation of an answer to the main research question of this research, which is the following:

*MQ: How can a client involved in a contractual portfolio approach effectively align its decisions with the objectives it set on a portfolio level?*

The answer to the main question does not solely consist of specific links between certain objectives on the one hand and choices on the other. Instead, it is more useful to provide an answer in a broader sense. A client involved in a contractual portfolio approach can align its objectives with its decisions by first specifically determining its objectives. This involves prioritising and determining which objectives play a role on the portfolio level. With these objectives in mind, the client can critically assess the choice options it has within the CPA. Certain choices are logical to make in a CPA situation, regardless of the objectives. The client can incorporate these logical choices that may not directly affect the specific objectives, but that do have an influence on the overall success of the CPA, and therefore indirectly on the objectives. Next to that, it is pivotal to incorporate the specified objectives on

the portfolio level in the choice options as much as possible. In making these decisions, it is important for the client to take into consideration that the situation it finds itself in, for example regarding the complexity of the environment or the status of its own organisation, has an influence on these choices. Additionally, it is important for the client to realise that even though some choices are logical in every CPA case, some choice options involve explicit dilemmas, where pursuing one goal comes at the expense of another. Especially for these dilemmas, it is important for clients to explicitly prioritise objectives and to determine what it wants to pursue.

So, for effective alignment of choices with objectives, it is pivotal for the client to combine the logic of CPA, its established objectives and the situational factors that play a role. Only in this way, the client puts itself in the position to make choices that lead to effectively attaining its objectives.

All things considered, it can be concluded that the Dutch construction sector finds itself in a perilous situation. A large renovation and replacement task laying ahead in combination with a market that does not always function the way it should, creates the need for a paradigm shift in working practices. Because of its ability to enhance efficiency and sustainability and to create a healthier situation in the market, the contractual portfolio approach forms a pivotal answer to this challenge. Change is needed, and public clients have to propose themselves as the initiators of this change. With this research, public clients are guided in their implementation of the contractual portfolio approach, with which they can establish themselves in this initiating role.

# 6

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## RECOMMENDATIONS FOR PUBLIC CLIENTS IN THE CIVIL ENGINEERING SECTOR

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This chapter provides clients in the civil engineering sector with advice on how to implement a contractual portfolio approach in an effective manner. It consists of general recommendations that transcend specific choices, guidance on making choices in a CPA situation, combined with advice on how to align those choices with objectives. Additionally, it addresses how to deal with situational factors, and concludes with explaining how the CPA Decision Guideline can be utilised.

### 6.1. General: effectively implementing CPA

To start, it is crucial to emphasise the complexity of a procurement process for a construction work, and the absence of a universal answer to what a client should do to effectively implement a CPA. Therefore, it is essential to pay attention to the different aspects that play a role in this system. This means that clients in the sector are advised to thoroughly consider all the available choice options presented in this research, from the perspective of a CPA. They should ask themselves the question, “should I make the same decision as in a situation without CPA?”. For clients dealing with cases with relatively simple objects, it is likely that these decisions differ significantly. This research takes a broader perspective beyond the boundaries of organisations, creating a more diverse view on the contractual portfolio approach. Clients are encouraged to adopt this viewpoint to prevent themselves from being trapped in the tunnel vision of their own organisation. This also includes using the definition of CPA as presented in this research instead of their own more narrow definition.

Additionally, clients should acknowledge that CPA is not the best solution for every problem. While some related approaches, like the programmatic approach, go hand in hand with the CPA, they may not always be the best fit for every situation. For instance, if the primary objective is to learn across works and other objectives are subordinate to this, a cross-project learning strategy might suffice without the implementation of a CPA. Moreover, clients should explicitly formulate their objectives, resulting in a concise list they can actually focus on. A too dispersed set of objectives limits this focus and reduces the effectivity of CPA for these objectives. If the client still ends up with a long list of objectives, it is advisable to create a hierarchy in the objectives and only base the decisions on the most important ones. Objectives considered as ‘secondary goals’ are likely to be overlooked anyway (Biber, 2009, p. 4). The hierarchy should be based on what Locke and Latham (2013, p. 7) call ‘goal commitment’, meaning that the persons involved should actually be determined to achieve these objectives. Furthermore, clients should recognise that objectives do not have to be contradictory in essence, but might be in some cases. For instance, short-term objectives related to efficiency tend to create a situation in which longer-term objectives are overlooked. In such cases, clients can either prioritise objectives and focus on one of the two, aligning to Bandari et al.’s (2022) proposal for dealing with the SDGs, or ensure a balanced focus on both sides of the spectrum. Ultimately, clients are advised to view CPA as a way to create a healthier market situation. CPA shows potential for this, but merely implementing a CPA is not enough. When making choices, clients are therefore advised to consider the impact it has on the market.

### 6.2. Choice options: making logical decisions in a CPA situation

Following the preceding paragraph, for certain choice options, it is important for the client to actively consider the market. This starts in the procurement phase, where an ambition document should be communicated along with the selection and award criteria. Then, for both the way in which the works are bundled and the number of contractors that is included in the portfolio, a balanced should be sought between two aspects. On the one hand the capacity of the market, meaning that the scope of the portfolio should not exceed this capacity. Logically, a portfolio does not make sense if there is no party available to execute the works. For the number of contractors, it is crucial to include enough contractors to ensure the successful execution of the works. On the other hand, the portfolio should be large enough for the market to be interesting, or, reasoning from the number of contractors, this number should be limited in such a way that every contractor is assigned to an interesting part of the portfolio.

In addition to this, clients are advised to consider the aspect of organisational embedding, which comprises three key aspects. Firstly, aligning to the previous paragraph, the main objectives of the portfolio should be derived from broadly supported organisational objectives. Secondly, the asset management department should be involved in the portfolio in order to streamline the

handover process. As multiple sources mention, aspects like Building Information Modelling (BIM) can assist in this handover process (Cavka et al., 2017; Kassem et al., 2015). Thirdly, benefits of the approach should be communicated with the organisation's line management. This can be done both directly and indirectly, in which the latter involves communicating with the public, creating broader support and through this way transferring the relevance to the rest of the organisation.

Furthermore, clients should safeguard some form of continuity throughout the portfolio. This means continuity in persons, which can be reached by increasing the working pleasure and safeguarding a constant flow of work, or with the previously mentioned organisational embedding, which makes it possible to continue the portfolio in the same way, regardless of the specific individuals that are part of it.

Then, it is important to take the main dilemmas CPA imposes into consideration. These dilemmas create a situation where a choice has both a negative and a positive influence on the attainment of the objectives, and therefore an explicit consideration is required on whether or not to make this choice. As an exemption, for the dilemma standardised work packages versus exploiting additional opportunities, a solution can be formulated with which both sides of the dilemma can be exploited. To do this, clients are advised to consider a solution where additional opportunities can be exploited in a track parallel to the workflow of the portfolio. In this way, two tracks are created where the first one merely focusses on the core of the portfolio, where the other focusses on exploiting additional opportunities.

Lastly, it is important for clients to have a critical look at the legal implications of the CPA. Even though this research does not show clear relations between objectives and legal aspects, there are pros and cons to every legal form and certain general legal aspects that should be thought of.

### 6.3. Objectives: aligning choices to predefined objectives

In chapter 4, relations between choice options, factors and objectives are described. These are causal relations, displayed with system diagrams, meaning that the one results in the other. Therefore, the line of reasoning starts at choice options, which influence factors in the system, which in turn influence the attainment of end-objectives. Now, in order to provide clients with insights on how to align their decisions with their objectives, this line of reasoning is reversed. This entails taking objectives as the starting point, and describing the choices that a client can make in order to reach these objectives, with specific focus on the main dilemmas.

First of all, clients are advised to limit the scope per work if learning across works is considered as an important objective. As described in chapter 4, limiting the scope per work enables the creation of standardised work packages in a constant workflow, enabling the contractor to learn from a work and apply these lessons-learned to the next work. Next to that, if this objective is prevalent, it is crucial to establish organisational embedding in a way that ensures retainment of the knowledge and way of working of the portfolio, even when individuals depart from it.

Then, if a client aims at creating certainty for the contractor and stimulating investment, it is advisable to retain from the implementation of performance management and to limit the degree of competition in the portfolio, since this decreases the certainty for the contractor.

Lastly, if a client pursues risk reduction, it is advised to include multiple contractors in the portfolio, since one can function as a backup for the other. On the other hand, striving for close collaboration indicates limiting the number of contractors.

#### 6.4. Situational factors: taking into account aspects in the context of the situation

It is recommended for clients to consider situational factors when making decisions related to the CPA. The most important situational factors, being complexity of the works, complexity of the environment, urgency, knowledge of the task and readiness of the organisation, all have an influence on how decisions should be made. For instance, if the organisational readiness is limited, clients are advised to implement a moderate type of CPA, in which they start with a simple work. With this, the organisation gets acquainted with the CPA in an incremental way, as opposed to a radical form of introducing new approaches (Ettlie et al., 1984). As another example, a limited organisational readiness makes it advisable to focus more on organisational embedding in the form of communicating the need for the approach, since 'conservative' organisations need information to accept changes (Miller & Friesen, 1982).

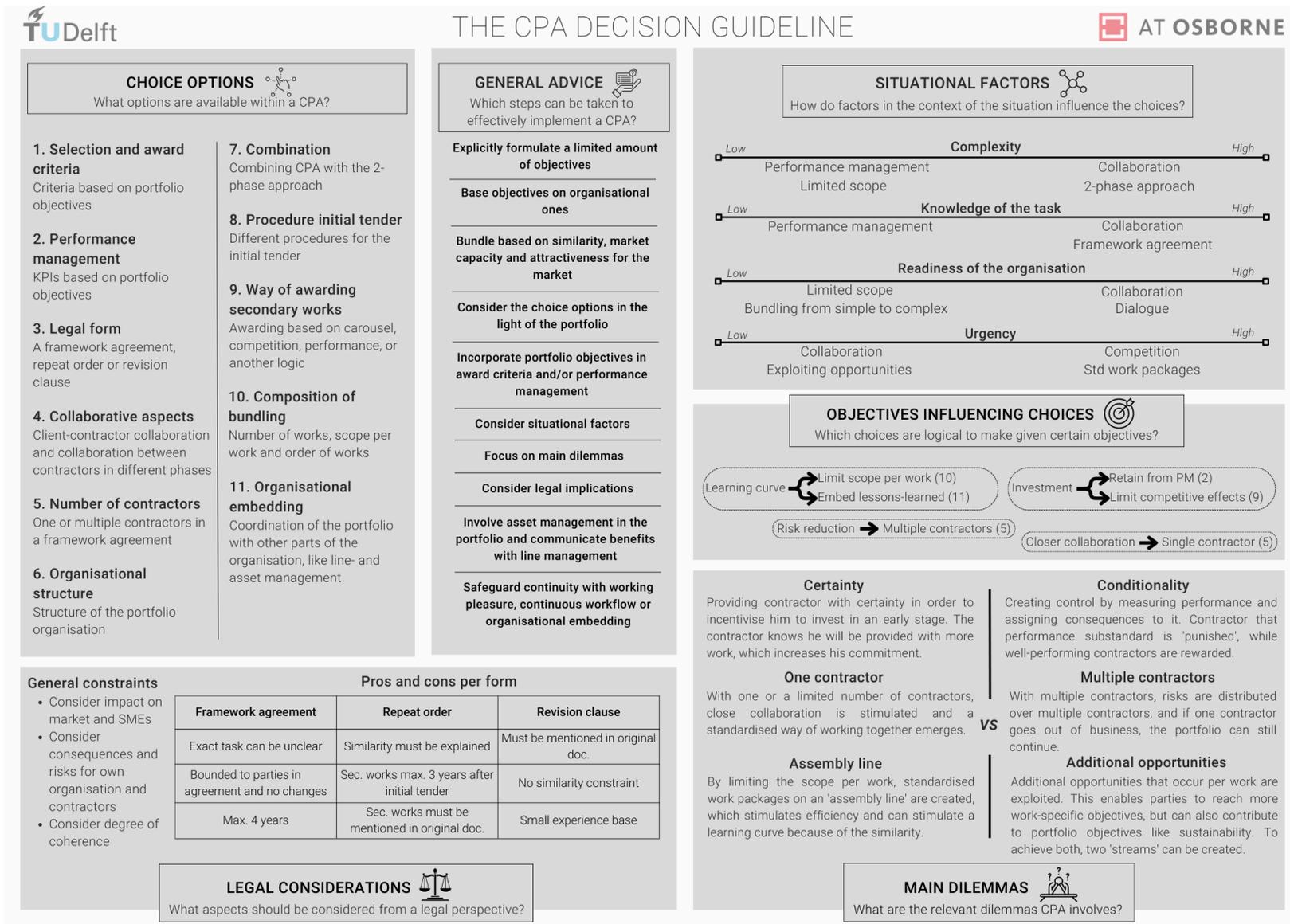
#### 6.5. The CPA Decision Guideline: using a framework to structure decision-making

As a final recommendation, this research conveys to clients who consider implementing CPA to take advantage of the opportunities the CPA Decision Guideline, as depicted in figure 6-1, has to offer. This guideline can serve as a valuable tool to structure their thoughts, facilitate a meaningful discussion and ultimately support them in their decision-making regarding CPA. The guideline provides clients with a comprehensive overview of relevant choice options, a general advice, legal considerations and main dilemmas, which are all aspects that assist the client in making its choices. It is important to note that this guideline is not an exact choice model with input and output variables that dictate specific decisions. Instead, it serves as a guiding tool that helps clients in their decision-making. To fully utilise the guideline, the users should be provided with the outcomes of this research as well, since the model itself does not provide all the background information that is needed to make well-substantiated decisions.

Please note that this decision guideline is designed for usage on A3 size or larger. Zooming in might be required for readability.

Since this research is primarily aimed at clients in the Dutch civil engineering sector, a Dutch version of the CPA Decision Guideline is provided in figure 6-2.

Figure 6-1 - The CPA Decision Guideline (made by author)



### LEGAL CONSIDERATIONS

What aspects should be considered from a legal perspective?

### MAIN DILEMMAS

What are the relevant dilemmas CPA involves?

### GENERAL CONSTRAINTS

- Consider impact on market and SMEs
- Consider consequences and risks for own organisation and contractors
- Consider degree of coherence

### Pros and cons per form

Framework agreement	Repeat order	Revision clause
Exact task can be unclear	Similarity must be explained	Must be mentioned in original doc.
Bounded to parties in agreement and no changes	Sec. works max. 3 years after initial tender	No similarity constraint
Max. 4 years	Sec. works must be mentioned in original doc.	Small experience base

### CERTAINTY

Providing contractor with certainty in order to incentivise him to invest in an early stage. The contractor knows he will be provided with more work, which increases his commitment.

### CONDITIONALITY

Creating control by measuring performance and assigning consequences to it. Contractor that performance substandard is 'punished', while well-performing contractors are rewarded.

### ONE CONTRACTOR

With one or a limited number of contractors, close collaboration is stimulated and a standardised way of working together emerges.

### MULTIPLE CONTRACTORS

With multiple contractors, risks are distributed over multiple contractors, and if one contractor goes out of business, the portfolio can still continue.

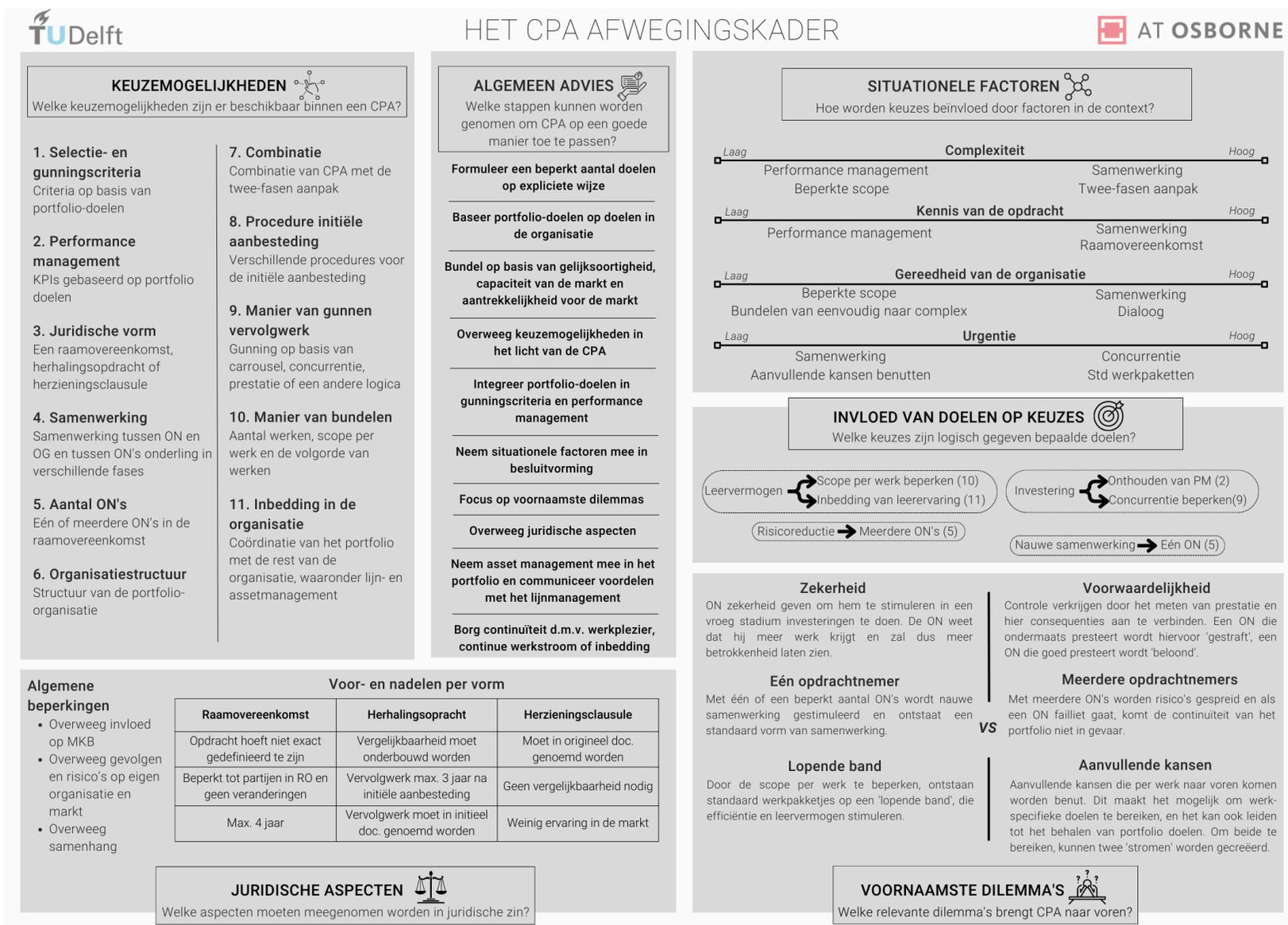
### ASSEMBLY LINE

By limiting the scope per work, standardised work packages on an 'assembly line' are created, which stimulates efficiency and can stimulate a learning curve because of the similarity.

### ADDITIONAL OPPORTUNITIES

Additional opportunities that occur per work are exploited. This enables parties to reach more work-specific objectives, but can also contribute to portfolio objectives like sustainability. To achieve both, two 'streams' can be created.

Figure 6-2 - The CPA Decision Guideline, Dutch version (made by author)



# 7

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## DISCUSSION & RECOMMENDATIONS FOR FURTHER RESEARCH

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This chapter takes a critical look at the conducted research. It starts with a general reflection, after which specific limitations of the research are described. These limitations can be a result of both the scope and the method of the research and are accompanied by recommendations on how future researchers could fill these gaps with new studies.

## 7.1. General reflection

The conducted research is a dive into the complex subject of the contractual portfolio approach. This is a relatively unexplored territory, in which both practitioners and researchers have limited experience. This research grasps a part of this territory, by making a first sketch on how parties in the civil engineering sector can deal with the approach. A vital step, considering the scarcity of existing knowledge on this topic. Both parties in the civil engineering sector and researchers can benefit from the information from this research. It covers the definition of CPA and how the approach can be positioned regarding other approaches, and relevant objectives, choice options, situational factors and dilemmas associated with its implementation. During the interviews, several respondents underline the lack of know-how regarding the CPA in general, and especially emphasise the absence of a viewpoint that surpasses individual organisations, substantiating the relevance of this research.

However, all of this is done on an explorative basis. This implies that the results are generally broad and descriptive, without taking on very black and white standpoints or giving unequivocal advices. Even though it is often tempting to delve into the specifics of an individual choice option or other aspect of this research, its explorative character forces the researcher to only touch upon every aspect swiftly, while keeping in mind the bigger picture.

### 7.1.1. Ongoing cases

Indicative for its explorative character, is the assessment of unfinished portfolios in the case study performed in this research. Since the CPA is such a novel approach, its implementation in real-world cases is still relatively limited. Moreover, the cases that do include CPA, are mostly still ongoing. These running cases enable this research to define objectives and determine choice options, but make it difficult to make clear statements in the sense of 'this choice leads to that', since clients will only be sure how choices turned out once the portfolio is completed.

### 7.1.2. Generalisability

Another aspect that aligns to this, is the generalisability of the findings. In subsection 2.1.5., the research explores this subject, by outlining certain elements considered in this research that increase the generalisability of the findings, such as incorporating a varied set of cases and linking the findings to academical theory. However, it is important to note that complete generalisability cannot be guaranteed. In quantitative research, a statistically representative sample can be drawn from the population, which allows the researcher to make inferences about the entire population based on the sample. While this approach also does not give a hundred percent certainty, it does provide the researcher with a justification for generalising the findings. Due to the qualitative character of this research, this is not a feasible approach. Moreover, generalisability of case study findings is commonly described as relatively low (Nielsen et al., 2019). Therefore, the generalisability is limited to an 'indication' that the findings are generalisable based on certain aspects. There remains a possibility of bias in the cases, such as the exclusion of clients who have an entirely different view on CPA.

### 7.1.3. Indicative findings

Resulting, the findings described in this research are merely indicative for the real-world. Dominant relations from the case study are described to indicate logical choices in a CPA situation, but should be understood as a simplified representation of reality. For instance, in a system diagram, the relation 'a limited number of contractors leads to closer collaboration' is defined. Such a relation holds true in most cases, meaning that a client who minimises its number of contractors is likely to achieve closer collaboration. However, it does not guarantee that the one always leads to the other. In line with this, there may be cases where a close form of collaboration is achieved with a large number of contractors. This is also the general trend derived from the expert validation session, where experts acknowledge the logical nature of the

described relations and their usefulness in practice, but are also able to provide examples where certain relations do not completely apply.

Combining these aspects leads to the conclusion that this research should be considered a stepping stone rather than the final destination in the exploration of the contractual portfolio approach. It provides a valuable starting point that lays the foundation for future, more specific research in this area. This is also displayed by the decision guideline, which is a tool that supports the decision-making process, rather than an exact choice model. In coming years, when the number of cases in which a CPA is implemented will increase, new research can be conducted. This research can offer more specific insights into the effectivity of certain choices, allowing for 'hard' conclusions, such as 'choice X leads to outcome A', to be drawn. As a result, a decision-support-system can be developed, building upon the decision guideline from this research, but evolving in a more exact choice model with input and output variables.

## 7.2. Limitations & recommendations for further research

In this section, specific limitations of the conducted research will be described, accompanied by recommendations for further research. These limitations either result from the scope that is chosen, leading to certain aspects that are inherently left out of the research, or the chosen methodology, which has its own constraints.

### 7.2.1. Desirability of CPA

This research assumes that the decision to implement the contractual portfolio approach in a particular situation is already been made in the affirmative. Even though an extensive explanation of the benefits is given in order to substantiate the added value of the approach, a full overview of positive and negative aspects of CPA is not provided. This standpoint is justified in the context of the present renovation wave, which necessitates the implementations of approaches like CPA anyhow. However, on the long term, information on both pros and cons might be valuable. For example, a downside of CPA mentioned multiple times in literature is its potential to limit competition. Estache and Limi (2009) argue that competition is a powerful mechanism to control costs, and since cost reduction might be one of the objectives of CPA, the approach could inadvertently hinder its own goals. On the other side, sources claim that the bundling of works can stimulate competition as the assignment becomes more interesting for market parties (Li et al., 2008; Nerenz, 2006). As another potential downside, CPA might create adverse incentives in certain situations. For instance, it was mentioned during interviews that market parties often underbid projects with the intention to recoup the costs during the execution phase. With CPA cases, this behaviour might be further encouraged, since the contractor has a longer period to offset the costs, potentially resulting in more and larger cost overruns. This is only one example derived from the interviews, but there might be many more of them.

In the long term, it would be interesting to assess the desirability of CPA, both in a general sense and in specific situations. Therefore, an advice for further research would be to create an overview of the advantages and disadvantages of CPA and to determine in which situations the implementation of a CPA is desirable. This can be done by determining the factors that influence this desirability, like the composition of the market and the readiness of the organisation. Next to this, a comparison with similar approaches can be made. In this research, the CPA is positioned with respect to other approaches in order to determine what characterises this approach. It does not provide an analysis of the best approach for a certain situation. A research that compares the approaches and describes in which situations which approach is best suitable, can be an interesting addition to the current body of knowledge.

### 7.2.2. Client perspective

It is essential to acknowledge that this research is in essence conducted from a client perspective. Obviously, various aspects discussed have an influence on other parties in the sector as well. CPA is considered as a way in which a healthier construction sector can be created, which can benefit all parties involved. Next to this, certain objectives have a direct impact on contractors, but are considered client objectives because of their indirect effect.

Despite this, it would be very interesting to take the perspective of contractors into account more thoroughly. Multiple studies in the construction sector present a combination of client and contractor perspectives as a key benefit of their approach, indicating that this adds value to the outcome of the research (Hoseini et al., 2020; Pesämaa et al., 2018). Where the current research focussed on the objectives of the clients and the choices they have, future research could focus on the implications these choices have on contractors. Linking this to the previous paragraph, this could result in a more diverse and multilateral view on the pros and cons of CPA, instead of only describing the options clients have. For this, a case study could be done in which both sides of the spectrum are being interviewed. With semi-structured interviews, stakeholders from both sides could be questioned about their view on CPA.

### 7.2.3. Public-private relations

In this research, a deliberate decision is made to focus solely on cases involving public procurement. This means that the procurement process is initiated by a public authority, and due to its public nature, it must comply with Dutch procurement law. The stipulations in this law significantly limit the flexibility a client has in terms of choice options. Therefore, this research is based on the assumption that procurement law imposes such substantial constraints on the situation, that it would be unwise to disregard this factor. This assumption results in business to business situations, without a public authority and therefore without the limitations of procurement law, being not taken into consideration.

However, as one respondent points out, it can still be interesting to examine this type of situations. As this respondent formulates it, “we tend to conclude very quickly that something is not allowed, while we should focus more on opportunities”. Therefore, exploring how private entities manage their bundled procurement, without the limitations of procurement law, might be an interesting way to show these opportunities. Tadelis (2012) undertakes this approach for procurement in general, by applying lessons from the private sector to public procurement. This research specifically states that the private sector entails certain characteristics that form interesting insights for public-private situations. To apply this to bundled procurement, it would involve assessing the choices private clients make and evaluate whether these choices assist in reaching their objectives. This research can be conducted with a case study in which business to business cases are included. The possibilities derived from these cases can be defined and subsequently examined on the basis of procurement law, to determine their applicability for public-private situations. In this way, reasoning is done on the basis of opportunities, after which limitations are discussed, instead of taking these limitations as a given from the start.

### 7.2.4. Single-portfolio situation

In this research, the term contractual portfolio approach is demarcated with a definition, which includes the bundling of multiple works into one initial tender. This means that if a client decides to bundle works into a framework agreement and procure in this way, it is considered as a CPA. Thus, for this research, choices made within this framework agreement are taken into account, while others are excluded from consideration. However, in most cases, this is an oversimplified way of displaying the considerations clients actually make. In most real-world examples, clients consider the possibility of multiple CPAs as alternative for one. Choices that are made in the light of multiple CPAs combined, have influence on the choices within each individual CPA, and

vice versa. As an example, the number of contractors is considered as an important consideration in a CPA. One contractor in this sense means that a framework agreement or other legal form of CPA is entered into with a single contractor. However, when taking a broader perspective, the task could be divided over multiple portfolios, each with its own contractor. Consequently, while this situation appears to be a single-contractor CPA, it involves multiple contractors in total. If the decision to collaborate with multiple contractors is driven by the desire to mitigate the risk of having to start a new agreement if one contractor goes out of business, it makes sense to include multiple contractors in a single CPA. On the other hand, if this choice is solely based on the limited capacity of the individual contractors, it might be more logical to split the task into multiple portfolios. As this research only reasons from a perspective within a portfolio, such trade-offs cannot be analysed in a thorough manner.

A recommendation for further research would be to assess the contractual portfolio approach from a helicopter viewpoint, by not only looking at the portfolio itself, but also at its interfaces with other portfolios. For this, a case study research can be conducted with focus on cases where a programmatic approach is implemented, since these cases inherently involve decisions made from a portfolio-transcending viewpoint.

#### 7.2.5. Pricing

In multiple interviews conducted within the case study, pricing is considered as one of the challenges when implementing a CPA. Especially in a one-on-one situation, where the client and a single contractor have to come to a price together, respondents claim to face difficulties in reaching a fair agreement, due to the contractor's position of power. This is reinforced by the longer-term character of CPA, as contractors are well aware that the client does not intend to dissolve the contract prematurely. This aligns with literature that explains the negative effect of competition on prices (Grega & Nemec, 2015), implying that CPA situations with less competition may result in higher prices.

Despite the significance of pricing as a challenge in the implementation of CPA, this research does not include pricing mechanisms. This is done deliberately, since it does not fit in as either an objective or a choice option, and because pricing is a large subject that requires more time to investigate thoroughly. However, pricing in CPA situations can be a very interesting research topic in the future. It would especially be interesting to assess the effect of the longer-term character of the CPA on the behaviour of contractors in pricing, and to determine what measures can be taken to come to a fair price agreement. This recommendation is substantiated by experts in the validation session, who state that pricing is an important part of the contractual portfolio approach.

#### 7.2.6. Learning from similar approaches

In constructing a definition of the contractual portfolio approach and positioning it in the field of approaches regarding procurement, multiple similar approaches have been considered. Strategies like the programmatic approach are presented, and both similarities and differences between both approaches are described. This eventually resulted in a definition of CPA, which forms one of the boundaries of this research. If an approach does not fall within the constructed definition, it is not analysed. This is a logical and useful way of limiting the scope of the research. However, similar approaches could also provide interesting insights for the implementation of CPA. As an example, a research could be conducted into the objectives and choices that are made within the programmatic approach, out of which results can be extracted that can be juxtaposed onto the contractual portfolio approach. This is interesting since many aspects of the dynamic of a programmatic approach are similar to the CPA, and is especially useful because the experience-base of the programmatic approach is significantly larger than the one of the CPA. The first part of this research can be used to assess the similarities of the two

approaches, on the basis of which future research can determine what aspects of the programmatic approach can be used for implementation of the CPA.

#### 7.2.7. Bias towards the theoretical framework

The interviews in this research are conducted on the basis of a theoretical framework, which means that theory from a literature review is used to ask more specific questions and to guide the conversation with respondents. Because of the semi-structured character of the interviews, respondents are provided with the space to give their own input, regardless of the theory, by starting with open questions. This is especially vital in order to avoid bias.

Both the objectives and the choice options derived from the interviews largely correspond to the ones from the theoretical framework. This could indicate that the literature review is done in a thorough manner, or that clients base their strategies on academical literature. However, it might also indicate a certain bias towards the theoretical framework. Even though open questions are used in the interviews, the researcher might still unconsciously steer the respondent in a certain direction. Obviously, this technique also has its advantages, being the fact that more specific questions can be asked and the researcher is better capable of responding to what is being said in the moment. Nevertheless, weighing the pros and cons of this approach is difficult. In future research, it might be advisable to use an approach that is less prone to bias. This can for example be done with the grounded theory approach, which develops theory on the basis of the interviews, instead of using theory at its basis (Oktay, 2012).

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# APPENDICES

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## CASE DESCRIPTION AND -SELECTION

### A.1. Long list

*This content is not visible in the published version.*

## A.2. Selection

Out of the set of possible cases for this case study, a limited amount of cases is selected. This is done on the basis of one requirement and four criteria, being:

### Requirement

- > *(Preliminary) purchase strategy is determined*

Information about the goals that the client had in mind when choosing the CPA and certain choices that have been made forms a vital part of the input of this research. Choices do not have to be implemented and it is not necessary to know whether the goals have been reached or not, but at least a strategy, in which goals and choices are highlighted, is needed for this research.

### Criteria

- > *Explicitness of considerations: for some cases, the CPA might just be a result of circumstances instead of an explicit choice that is made on the basis of certain goals. On the other hand, for other cases the CPA might be very goal driven and choices might be made very explicitly. The more explicit considerations have been made, the better conclusion can be drawn.*
- > *Variety of goals: goals can to some extent be determined upfront (with literature study). Cases should display a variety of goals in order to map the whole spectrum of goals and CPA structures.*
- > *Variety of clients: every client has a different view on CPA. Preferred is to have cases that display multiple clients. Especially the bias of only looking from an RWS viewpoint is plausible.*
- > *Variety of scopes: large complex projects have different characteristics than simple more repetitive ones. For the first it will be more about innovation and learning, the latter more efficiency, standardisation. So, variety in this is needed as well.*
- > *Variety of forms: 4 standard forms, framework agreement etc. important to use multiple*

Four out of the five criteria have to do with the set of cases as a whole. Therefore, selecting on the basis of an MCA or something similar is not possible. A balanced set has to be constructed.

### A.3. Comprehensive description of selected cases

*This content is not visible in the published version.*



## INTERVIEW GUIDE

### Introductie

#### **Inhoud**

Dit interview is onderdeel van een afstudeeronderzoek als afsluiting van de studie Construction Management & Engineering aan de TU Delft. Het onderwerp van dit onderzoek is het bundelen van meerdere werken in één initiële tender, waarnaar in dit onderzoek gerefereerd wordt met de term 'contractuele portfolioaanpak', of 'CPA'. Er wordt antwoord gezocht op de volgende vraag:

*Hoe kan een contractuele portfolioaanpak worden ingevuld op een manier dat de doelen van de betrokken opdrachtgever worden behaald?*

Het bundelen van werken in een aanbesteding is een relatief nieuwe aanpak die nog weinig is geïmplementeerd en waar nog weinig over onderzocht is. Daar tegenover staat dat deze aanpak in de huidige staat van de sector, waarbij V&R opgaven steeds belangrijker worden en tijd, materiaal en arbeidskracht schaars zijn, steeds relevanter wordt. Dit maakt het dan ook belangrijk om meer inzicht te krijgen in deze aanpak.

Dit onderzoek bestaat in grote lijnen uit drie delen. Allereerst wordt gepoogd een duidelijke definitie van het concept CPA te bepalen en de aanpak te positioneren ten opzichte van andere aanpakken. Vervolgens wordt gekeken naar de doelen op basis waarvan opdrachtgevers de keuze maken voor de CPA of een vergelijkbare aanpak. Als derde wordt onderzocht welke keuzes er binnen een dergelijke aanpak gemaakt kunnen worden om deze doelen te verwezenlijken.

#### **Methode**

Om de benodigde informatie te vergaren, is gekozen voor een casestudie met interviews. In deze casestudie worden 4 a 5 casussen beschouwd waarbij werken zijn of worden gebundeld in een tender. Binnen elke casus worden meerdere experts met relevante rollen bevraagd naar hun ervaringen met de casus. Dit gaat op een semigestructureerde manier, wat betekent dat een kader gevolgd wordt om het interview enige sturing te geven, terwijl het tegelijkertijd een vloeiend en open gesprek blijft met ruimte om dieper op bepaalde punten in te gaan.

#### **Praktische zaken**

Dit interview wordt getranscribeerd door middel van MS Teams. Deze transcriptie wordt vervolgens door de onderzoeker gecodeerd waardoor de belangrijke punten geanalyseerd kunnen worden.

Het interview wordt uitsluitend gebruikt voor het beschreven onderzoek voor de TU Delft. Dit betekent dat de informatie uit de interviews in verwerkte vorm terug te vinden is in het eindrapport van het onderzoek, dat zal worden gepubliceerd in de repository van de TU Delft. Namen van personen en projecten zullen in deze versie worden weggelaten, en worden alleen ter verificatie gecommuniceerd aan de leden van de afstudeercommissie.

Dit alles wordt gedaan op basis van een data management plan dat is opgesteld volgens de richtlijnen van de TU Delft. U wordt hiervoor gevraagd een formulier 'geïnformeerde toestemming' te ondertekenen, waarbij u aangeeft akkoord te gaan met de manier waarop in dit onderzoek met uw data wordt omgegaan.

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**Thema 1 – Introductie**

In dit thema leren respondent en onderzoeker elkaar kennen en wordt een uitleg gegeven over de inhoud van het onderzoek en het interview. Daarnaast wordt bij wat praktische zaken stilgestaan, zoals de manier van dataverwerking. Verder is er aan beide kanten ruimte om onduidelijkheden vooraf weg te nemen.

Table B-1 - Protocol theme 1

	<b>Vraag/mededeling</b>	<b>Uitleg/doel</b>
A	Laatste check onduidelijkheden: Heeft u voordat we beginnen nog vragen?	Laatste onduidelijkheden wegnemen.
B	Introductie van onderzoeker	Beeld schetsen van onderzoeker met studie, achtergrond, etc.
C	Introductie van onderwerp	Onderwerp uitleggen inclusief context, onderzoeksdoel en -vraag en uitleg van wat in dit onderzoek verstaan wordt onder CPA.
D	Introductie interview	Doel en manier van interviewen duidelijk maken.
E	Data management	Uitleg verwerking gegevens volgens data management plan.
F	Check geïnformeerde toestemming en data management plan: bent u inderdaad akkoord met alles wat beschreven staat in het formulier geïnformeerde toestemming en het data management plan?	Controleren of de respondent inderdaad akkoord is met het onderzoek en de manier waarop data verwerkt wordt.
G	Introductie respondent: zou u zich voor kunnen stellen en aan kunnen geven wat uw rol is/was in [project X]?	Beeld schetsen van respondent en zijn of haar rol. IJs breken.
H	Introductie casus: zou u kunnen omschrijven wat [project X] precies inhoudt/inhoud?	Beeld schetsen van casus vanuit het perspectief van de respondent.

## Thema 2 – Context & definitie

Dit thema bouwt voort op de introductie door wat dieper in te gaan op de casus die wordt onderzocht. Er zal een eerste beeld geschetst worden van het aanbestedingsproces en de keuzes die hierin zijn gemaakt, in algemene zin en in specifieke zin met betrekking tot het bundelen van werken. Daarnaast wordt de definitie van CPA zoals die gebruikt wordt in dit onderzoek getoetst en wordt de aanpak gepositioneerd ten opzichte van aanpakken met overeenkomstige kenmerken, zoals de programmatische aanpak.

Table B-2 - Protocol theme 2

	Vraag/mededeling	Uitleg/doel
A	Beschrijving aanbesteding: zou u kunnen omschrijven hoe het aanbestedingsproces van [casus X] verloopt/is verlopen?	Beeld krijgen van het aanbestedingsproces. Dit scheidt de context waarbinnen specifiekere vragen over aanbestedingskeuzes kunnen worden gesteld.
B	Bundeling: op welke manier zijn/worden hierbij meerdere werken gebundeld?	Ingaan op het bundelen van werken. Beschrijven hoe dit in deze casus is/wordt gedaan.
C	CPA check: zou u de gekozen aanpak omschrijven als een CPA?	Checken of de respondent van dezelfde terminologie gebruik maakt.
D	[evt. verdieping]: wat maakt deze aanpak bijzonder? Hoe onderscheidt deze aanpak zich van een [vergelijkbare aanpak X]? Waarom is in dit geval voor de gebruikte aanpak gekozen en niet een vergelijkbare?	Bepalen wat de verschillen zijn tussen de CPA en vergelijkbare aanpakken zodat de CPA gepositioneerd kan worden ten opzichte van andere aanpakken.

### Thema 3 – Doelen

Met thema 3 wordt een antwoord gezocht op een van de deelvragen van dit onderzoek:

*Welke doelen trachten opdrachtgevers te bereiken met de keuze voor een contractuele portfolioaanpak?*

Dit wordt gedaan door eerst te inventariseren welke doelen bij deze casus spelen, om vervolgens de doelen die spelen op het niveau van het portfolio eruit te halen. Daarnaast wordt de ruimte geboden om aan te geven welke doelen hierbij extra belangrijk waren, zodat duidelijk wordt welke aspecten doorslaggevend waren in het maken van keuzes. Na een open inventarisatie zullen ook de doelen die de onderzoeker uit de literatuur heeft gehaald gedeeld worden, om te kijken of de respondent deze doelen herkent.

Table B-3 - Protocol theme 3

	Vraag/mededeling	Uitleg/doel
A	Inventarisatie doelen: Welke doelen zijn vooraf gesteld bij de aanpak van [casus X]?	Overzicht van doelen creëren.
B	Positionering doelen: welke doelen speelden mee voor de keuze voor de CPA? Welke doelen speelden op portfolio niveau?	Inzichtelijk maken welke doelen spelen op het niveau van het portfolio en deze onderscheiden van bijvoorbeeld project-specifieke doelen.
C	levt. Verdieping]: waarom [doel X]?	Sommige zaken worden geformuleerd als doel maar zijn eigenlijk een middel. Met deze vraag wordt naar het onderliggende doel gezocht.
D	Check doelen: in mijn onderzoek ben ik de volgende doelen tegengekomen (zie bijlage A) spelen deze ook een rol?	Sturing geven indien doelen worden gemist.
E	Belang doelen: waren hierin bepaalde doelen extra belangrijk?	Onderzoeken welke doelen hierin een grotere rol hebben gespeeld en welke doorslaggevend zijn geweest voor de keuze van de aanpak.
F	Afsluiting thema: heeft u verder nog relevante informatie met betrekking tot de doelen die spelen in deze casus?	Ruimte bieden om extra informatie te delen die niet direct uit de vragen naar voren is gekomen.

## Thema 4 – Keuzemogelijkheden

Met dit laatste thema wordt inzicht verkregen in de keuzes die gemaakt zijn binnen de contractuele portfolioaanpak. Hiermee wordt naar een antwoord gezocht op de volgende deelvraag:

*Welke keuzes maken opdrachtgevers binnen een contractuele portfolioaanpak?*

Allereerst worden de keuzemogelijkheden geïnventariseerd door te bespreken welke afwegingen er in de casus gemaakt zijn, dit kan gezien worden als de 'knoppen waaraan gedraaid kan worden' binnen een contractuele portfolioaanpak. Vervolgens wordt ingegaan op de daadwerkelijke keuzes die hierin zijn gemaakt, oftewel de 'standen van de knoppen'. Daarnaast zal ook bij dit thema ruimte zijn om het belang van keuzes aan te geven. Sommige keuzes zullen heel expliciet en met een doel in het achterhoofd zijn gemaakt, terwijl andere keuzes een logisch gevolg zijn van de context van de casus. Met dit deel van het interview wordt deze eerste categorie extra belicht. Ook in dit thema zal eerst een open inventarisatie gedaan worden, om vervolgens de keuzemogelijkheden uit de literatuur voor te leggen.

Wanneer de keuzes in beeld zijn gebracht zal in dit thema ook de link gelegd worden tussen enerzijds de gemaakte keuzes en anderzijds de doelen die gesteld zijn om zo de hoofdvraag te beantwoorden.

Table B-4 - Protocol theme 4

	Vraag/mededeling	Uitleg/doel
A	Inventarisatie keuzemogelijkheden: wat zijn volgens u belangrijke keuzemogelijkheden met betrekking tot de CPA die binnen deze casus zijn/worden overwogen?	Overzicht van keuzemogelijkheden creëren.
B	Check keuzemogelijkheden: zijn de aspecten uit bijlage B hierin van belang?	Sturing geven indien keuzemogelijkheden worden gemist. Gestructureerd aflopen van keuzemogelijkheden.
C	Verdieping keuzemogelijkheden: welke keuzes zijn/worden gemaakt met betrekking tot deze variabelen?	Dieper ingaan op keuzemogelijkheden waarvoor duidelijke afwegingen gemaakt zijn bij vraag 5B en onderzoeken welke keuzes gemaakt zijn.
D	Belang keuzemogelijkheden: waren/zijn hierin bepaalde keuzes extra belangrijk?	Onderzoeken welke keuzemogelijkheden hierin een grotere rol hebben en op welke keuzes extra is/wordt gefocust.
E	Link portfolio-doelen: hoe hebben de doelen op portfolio niveau invloed op de gemaakte keuzes?	Specifiekere link leggen tussen doelen op portfolio niveau en de gemaakte keuzes.
F	Exploratie uitkomst: voor zover u daar in deze fase uitspraken over kunt doen, dragen de gemaakte keuzes inderdaad bij aan de gestelde doelen?	Eerste idee krijgen van effectiviteit van bepaalde keuzes.
G	Afsluiting thema: heeft u verder nog relevante informatie met betrekking tot de keuzes die gemaakt zijn in deze casus?	Ruimte bieden om extra informatie te delen die niet direct uit de vragen naar voren is gekomen.
H	Afsluiting interview: heeft u nog andere mogelijk interessante informatie voor dit onderzoek?	Ruimte bieden om extra informatie te delen in algemene zin.

## Doelen

1. Kostenreductie
  - a. Transactiekosten
  - b. Uitvoeringskosten
  - c. Faalkosten
2. Tijdsreductie 3
  - a. Aanbestedingstijd
  - b. Uitvoeringstijd
3. Duurzaamheid stimuleren
4. Innovatie stimuleren
5. Beheersing van risico's
6. Standaardisatie & uniformiteit vergroten
7. Delen van informatie tussen ON & OG stimuleren
8. Leervermogen over de projecten heen stimuleren
9. Nauwere samenwerking tussen ON & OG
10. Modulair bouwen stimuleren
11. Reductie van middelen en materiaal
12. Kwaliteit verhogen door middel van performance management
13. Reductie van benodigd aantal werknemers
14. Voorspelbaarheid vergroten
15. Voldoen aan politieke urgentie
16. Productiecapaciteit vergroten

## Keuzemogelijkheden

Table B-5 - Choice options

Variabele	Uitleg
1. Criteria initiële aanbesteding	ON van het portfolio wordt gekozen op basis van bepaalde selectie- en gunningscriteria.
2. Performance management (PM)	Met PM worden de prestaties van de ON bijgehouden en gestuurd. Het hangt van de casus af of er wel of niet gebruik wordt gemaakt van PM.
3. Juridische vorm	Bij een CPA hoort een bepaalde juridische vorm. Dit kan een raamwerkovereenkomst, herhalingsopdracht of herzieningsclausule zijn.
4. Samenwerking	In welke mate is de OG betrokken bij ontwerp en uitvoering? Hoe intensief is de samenwerking?
5. Aantal opdrachtnemers	Het portfolio kan gegund worden aan één of meerdere ON's.
6. Organisatiestructuur	Hoe worden de betrokken personen georganiseerd? Wordt er een overkoepelend portfolioteam opgetuigd of wordt het gedaan met losse projectteams?
7. Combinatie met andere aanpakken	CPA kan worden gecombineerd met een tweefasen aanpak of andere aanpakken.
8. Aanbestedingsprocedure initiële tender	Voor de aanbesteding van het portfolio zijn verschillende aanbestedingsprocedures mogelijk.
9. Manier van gunnen vervolgwerk	Wijze waarop wordt vastgesteld of en hoe de ON ook de vervolgoopdrachten mag uitvoeren kan op verschillende manieren worden bepaald.
10. Manier van bundelen	De werken kunnen in verschillende samenstellingen worden gebundeld. Bijvoorbeeld eerst 2 in de initiële tender en dan 3 als vervolgoopdracht, of 1 in de initiële tender en 4 als vervolgoopdracht, etc.
11. Organisatorische inbedding	De manier waarop de aanpak is ingebed in de organisatie van de OG. Alles wat buiten de organisatie valt zoals bedoeld in keuze 6. Hoe zorg je dat bijvoorbeeld de directie of lijnmanagers ook het belang van de aanpak inzien?



## INTERVIEW CODEBOOK

Table C-1 - Codebook Atlas.ti

Code group	Code
Definitie	Definitie
Doelen	Aantrekkelijkheid voor de markt
	Administratieve lasten
	Continuïteit in personen
	Duurzaamheid
	Efficientie
	Faalkans
	Flexibiliteit
	Informatie delen
	Innovatie
	Investering mogelijk maken
	Kosten
	Leervermogen
	Mate van samenwerking
	Modulair
	Performance management
	Politieke urgentie
	Productiecapaciteit
	reductie middelen
	reductie werknemers
	Risicobeheersing
	Standaardisatie & uniformiteit
	Tijdsreductie
	Veiligheid
	Verhogen kwaliteit
	Voldoen aan politieke urgentie
	Voorspelbaarheid
	Werkplezier
Keuzemogelijkheden	Aanbestedingsprocedure
	Aantal ON's
	Combinatie met andere aanpakken
	Juridische vorm
	Manier van bundelen
	Manier van gunnen vervolgwerk

Code group	Code
	Organisatiestructuur
	Organisatorische inbedding
	Performance management
	Planning
	Samenwerking
	Selectie & gunning



## OVERVIEW OF RESPONDENTS

*This content is not visible in the published version.*



## EXPERT VALIDATION REPORT

### Definitie en positionering

De definitie zoals opgesteld in het onderzoek wordt voorgelegd aan de experts. Daarnaast wordt aangegeven wat hierin de onderscheidende factoren zijn.

De experts geven aan dat niet elke raamovereenkomst of elke herhalingsopdracht een CPA is. Het wordt pas een CPA als je strategische doelen wil behalen. Dat is het onderscheid tussen CPA en een normale raamovereenkomst of herhalingsopdracht. Het wordt pas een CPA als je echt wil verbeteren, over de werken heen. Ze geven aan dat het tweede deel van de definitie echt essentieel is.

Daarnaast vragen experts zich af waarom de term 'project-transcending' wordt gebruikt. Ze merken op dat iets pas een 'project' is als het op die manier georganiseerd wordt, en dat een CPA dus niet altijd uit meerdere projecten bestaat. 'Work-transcending' zou hierbij wellicht een betere definitie zijn.

Verder geven respondenten aan dat met het woord 'works' diensten automatisch worden uitgesloten, terwijl dit ook nuttige CPA's zouden kunnen zijn. Ze geven aan dat het binnen het onderzoek wel logisch zou kunnen zijn om dit buiten de scope te laten, maar dat in werkelijkheid diensten ook CPA's kunnen zijn.

### Doelen

Aan de experts wordt uitgelegd dat er veel doelen uit de interviews zijn gekomen, en dat er op basis van aantal keer genoemd en bundeling een overzicht is gemaakt van de belangrijkste doelen. Deze doelen worden vervolgens voorgelegd. Daarna wordt de typologie op basis van 2 assen voorgelegd.

Experts herkennen dat er vaak te veel doelen zijn. Dat is een duidelijk euvel waar men in de praktijk vaak tegenaan loopt.

Experts geven daarnaast aan dat de gevonden doelen overkoepelende doelen zijn, waar andere doelen onder vallen. Ze geven dan ook aan dat het belangrijk is om te beschrijven welke doelen onder een hoofddoel kunnen vallen. Bijvoorbeeld kostenreductie onder efficiëntie.

Experts slaan aan op de formulering. In werkelijkheid is risicomanagement geen doel, risicoreductie zou wel een doel kunnen zijn. In dat geval is deze heel herkenbaar.

Innovatie wordt ook gezien als doel. Deze staat niet expliciet genoemd, maar experts herkennen dat deze in andere doelen terugkomt.

Experts linken doelen aan werkwoorden en herkennen de doelen dus meer als ze als werkwoorden geformuleerd worden.

Experts zien de gezonde relatie met de markt ook als belangrijk doel.

Bij de typologie wordt de urgentie als gezien als een moeilijke kwestie. Wanneer iets urgent is en wanneer niet is moeilijk te bepalen. Je kan ook een hele urgente casus hebben met focus op lange termijn doelen en een niet urgente casus zonder. Ze kunnen hun casussen moeilijk positioneren. Kijkende naar het grote plaatje worden de assen wel herkend, alleen de positionering blijkt nog lastig te zijn.

Bij de samenwerkingsas wordt aangegeven dat samenwerking nooit een doel op zich is. Het is dus wel een interessante as, maar ze herkennen niet de link met doelen. Ze geven aan dat wel of niet samenwerken heel erg afhangt van de situatie. Samenwerken wordt meer gezien als een middel dan een doel. In het algemeen denken respondenten wel dat deze typologie valide is, maar vragen zich af of je kan zeggen dat het op basis van de doelen is en of het nuttig is om deze typologieën te maken.

Samenwerkingsas wordt ook gelinkt aan afhankelijkheid van ON. Ze herkennen in de as dat het ook een kwestie is van aan de ene kant afhankelijk zijn van een bepaalde ON, en aan de andere kant juist onafhankelijk zijn.

#### Keuzemogelijkheden

De 11 keuzemogelijkheden worden als resultaat gepresenteerd. Vervolgens wordt gepresenteerd welke keuzes over het algemeen gemaakt worden, gegeven dat je CPA doet.

Respondenten geven aan dat prijsvorming in werkelijkheid een belangrijke keuzemogelijkheid is. Prijsmodel wordt gezien als iets waar belangrijke afwegingen in gemaakt zijn binnen een portfolio aanpak. Er gaat een grote prikkel uit van prijsvorming in werkelijkheid.

Respondenten geven aan de keuzemogelijkheden te herkennen maar ze op basis van deze formulering wat vaag te vinden. Ze lijken overlap te hebben, dus ze moeten goed gedefinieerd worden om onderscheid duidelijk te maken.

#### **Selectie- en gunningscriteria**

Respondenten geven aan dat het bij een herhalingsopdracht moeilijk is om in gunningscriteria al portfolio doelen mee te nemen. Daar zit het meer in performance management. Het is juridisch gezien zelfs niet mogelijk bij een herhalingsopdracht. In raamovereenkomst situaties wordt dit wel meegenomen. Het gunnen op basis van de scope van je opgave wordt gezien als een open deur, dat is altijd zo. Respondenten geven aan dat bij een herhalingsopdracht de focus meer op performance management ligt, terwijl bij een raamovereenkomst wel meer met de gunningscriteria gedaan kan worden.

Samenwerking wordt niet herkend voor elke casus, dat is meer een keuze die je kan maken.

Experts geven aan dat er nog een onderscheid zit in selectie- en gunningscriteria.

#### **Performance management**

Dit deel wordt erg herkend. Blijkt wel een moeilijk punt te zijn. In de praktijk is het ook vaak een malus, en minder vaak een bonus. Het extra werk krijgen kan gezien worden als bonus.

### **Juridische vorm**

Respondenten geven aan dat deze keuze inderdaad heel erg afhangt van de situatie. Ze geven daarnaast aan dat Rijkswaterstaat in de handreiking CPA een afwegingskader heeft opgesteld met positieve en negatieve punten van elke vorm.

### **Samenwerkingsaspecten**

Samenwerking tussen ON's is niet altijd mogelijk. Hangt af van hoe het is ingericht. Als er nog minicompetities zijn is dit niet mogelijk. Experts zien het wel als iets waar naar gestreefd wordt, maar dat hangt af van de situatie.

### **Aantal ON's**

Wordt herkend als belangrijke factor. Wel vooral bij raamovereenkomsten. Zeker het feit dat elke opdrachtnemer een interessant deel moet hebben is iets wat voor de markt van groot belang is. Hierin wordt nog wel meegenomen dat je ook voor meerdere portfolio's zou kunnen gaan. Daarnaast wordt nog opgemerkt dat het meenemen van onderhoud in het contract ook als interessant wordt gezien. Het inrichten op zo'n manier dat het interessant wordt voor ON wordt dus herkend en wordt tevens wat breder getrokken.

### **Organisatiestructuur**

Experts geven aan dat het misschien niet altijd logisch is om een team op portfolio niveau in te richten. Meestal is het nuttig, maar als er te veel mensen in die laag zitten kan het ook juist negatief werken. Het wordt wel georganiseerd maar misschien ook te weinig. Experts geven aan dat er wel naar meerdere lagen gekeken moet worden. Dus een portfolio team kan logisch zijn, maar ook hierboven kijken naar een team overkoepelend over meerdere portfolio's.

Het belangrijkste is niet per se dat er op dat niveau een team is, maar vooral dat er iets gebeurt waardoor portfolio doelen bereikt worden. Er wordt ook herkend dat er soms wel een team op het niveau is, maar dat deze er vervolgens niet in slaagt om de portfolio doelen te waarborgen.

### **Combinatie met andere aanpakken**

Experts geven aan dat er ook andere achterliggende redenen zijn om in casussen twee-fasen en bouwteams te combineren met CPA, die niet per se met CPA te maken hebben. Toch lijkt het wel vaak een combinatie. Misschien wel meer in bredere zin, dat OG en ON samen naar eisen kijken. Breder dan de contractvorm. Combinatie is logisch maar hangt nog wel af van de werken.

### **Aanbestedingsprocedure**

Je moet je procedure af laten hangen van je initiële opgave. Bij herhalingsopdracht is er vooral focus op de eerste opdracht. Bij raamovereenkomst kan je wat meer kijken naar gehele opgave. CD wordt veel gedaan maar ook zonder CPA.

### **Manier van bundelen**

De aspecten worden herkend. In werkelijkheid worden er meer aspecten gezien, maar deze komen er zeker in voor.

### **Organisatorische inbedding**

Coördinatie met asset management en portfolio baseren op bredere doelen worden herkend. Het aspect organisatorische inbedding an sich wordt in ieder geval gezien als een belangrijk aspect. Het organiseren op en niveau hoger wordt hier ook aan gekoppeld. Bijvoorbeeld als je twee portfolio's hebt wil je ook een overkoepelend team.

## Spanningsvelden

De drie dilemma's worden gepresenteerd.

### **PM VS voorspelbaarheid**

Bij RWS wordt prestatie meten gezien als iets anders dan performance management. Het dilemma wordt wel herkend, maar met een andere formulering. Het gaat niet zozeer om voorspelbaarheid, maar wel zekerheid. Het is een goed dilemma maar een andere formulering is logischer. Het voorwaardelijk stellen versus continuïteit en zekerheid is een betere formulering.

Hier wordt aan toegevoegd dat je aan de ene kant commitment van een ON wil maar ook van een ON af kunnen als hij niet goed presteert.

Je wil 'ja tenzij', maar dat leidt inderdaad tot minder zekerheid voor de markt.

### **1 ON VS meerdere ON's**

Dit is altijd een afweging. Het is primair wel een afleiding van je opgave. Gegeven dat allebei kan, is het zeker een dilemma.

### **Continue stroom VS meekoppelkansen**

Wordt duidelijk herkend maar er wordt wel aangegeven dat de continue stroom over het algemeen iets is waar naar gestreefd wordt. Er wordt aangegeven dat dit vooral zit in de beginfase, in hoe je bundelt.

Vooraf de eerste en de laatste worden gezien als de hete hangijzers in de implementatie van CPA.

## Situationele factoren

Worden herkend, maar capaciteit en kwaliteit van de markt wordt hiernaast nog gezien.

## Invloed van situationele factoren op keuzes

### **Complexiteit**

Juist bij complexe objecten zijn gestandaardiseerde werkpakketten gecreëerd. Bij complexe omgeving wordt het wel gezien, maar bij complexe objecten hoeft dit niet zo te zijn.

### **Kennis areaal**

Zijn wel wat nuancerings in aan te brengen.

### **Gereedheid**

Wordt herkend. Dat is echt een aandachtspunt. Je moet je dan ook afvragen of het gewenst is.