

THE WOUW IN RELATIONAL CONTRACTING

A research in relational contracting maturity of
infrastructure project teams



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Preface

This thesis signals the end of my master's degree in civil engineering at the University of Twente. First, I would like to express my thanks to all the people in program WOUW for the knowledge sharing, interview possibilities, and enthusiasm in helping. In particular, Erin Hoogenboom for offering a place in the program to conduct this research from.

I want to express my gratitude and thanks to Roel Reuser for the guidance and support during the proposal and thesis writing phase.

I want to thank my academic supervisors, Hans Boes and Leentje Volker, for their guidance, and skill in research. Their feedback was very insightful and helped in completing this research.

At last, I want to thank my friends and family for their support and understanding in writing this thesis.

I hope this thesis contributes to the understanding of relational contracts and gives some valuable insight for the reader.

Mart Leeman

Abstract

This research explores maturity in relational contracting of infrastructure projects. Early traditional contracts have been mostly transactional with a focus on price. Due to a shift in project characteristics caused by the increased need for maintenance projects, the focus of the contracts changed. Projects became more complex and had a longer duration. Therefore, collaboration was sought with the market with an emphasis on relationships, trust, and shared objectives in the form of a relational contract.

The aim of this study is to design a framework capable of measuring maturity in relational contracts specifically for project teams. The methodology involved a literature review that first identified the components of a relational contract: collaboration, embedded social norms, relational risk allocation, and relational project administration. Furthermore, maturity models were analysed to establish a maturity scale, with the MMGP Prado model serving as key inspiration due to its focus on operational functioning within project teams. To provide practical substance to the framework, interviews were conducted with project members, including both client and contractor sides, who practiced in a relational contract.

The findings indicate that higher maturity levels are characterized by shared interests, transparency, trust, and joint decision-making. Conversely, lower levels are marked by individualistic approaches and limited collaboration. The data retrieved from practitioners refined the framework into a maturity matrix organized around three main components: Relational Project Administration (RPA), Distribution and integration of goals and interests, and Embedded social norms.

This research provides a tool that helps in indicating the maturity of a relational contract. Theoretically, it contributes by integrating relational contracting into maturity thinking. Providing a first step in developing a maturity model for relational contracting.

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Definitions & abbreviations

RC	Relational contracting
RT	Relational contract
RG	Relational governance
CC	Collaboration contract
TC	Transactional contract
MM	Maturity model
RRA	Relation risk allocation
RPA	Relational project administration
PM	Project manager
TM	Technical manager
EM	Environmental manager
MpC	Manager project control
CM	Contract manager
AM	Asset manager

1 Problem origin

1.1 Problem context

Traditionally, civil engineering consists of a client and a contractor. The client has a request with a budget, and a contractor can fulfil this request for a certain price. Over the years, various methods have been devised to improve the client's assignment and make it more profitable for the contractor. Throughout the history of construction, various initiatives have been taken to achieve this.

Looking at this history start at the beginning of the century, the contracting strategy was price-oriented and focused on the lowest price. This led to construction fraud at the start of 2000, where construction companies used rigged bidding to drive up the price of the project, allowing them to earn more per project. It was achieved through meetings in advance of bidding and the predictable procurement of the lowest price(Dorée, 2004).

To combat and change this, RWS(national infrastructure agency) changed its philosophy. RWS was pushed by politics to focus more on the quality of infrastructure with fewer personnel by involving the market more. The proposed solution is to do less engineering and more managing(Rijkswaterstaat, 2008). Therefore, the solution was sought in the governance of the projects. In the following years, Rijkswaterstaat(RWS) opted for a more efficient and centralised way of managing projects through a national and uniform approach and developed IPM(integral project management; integral project management)(Heijden, 2017). Further, a reorganisation in 2013 created the division GPO(Grote Projecten en Onderhoud; big projects and maintenance) for projects smaller than 60 million euros and PPO(Programma's, Projecten en Onderhoud; programs, projects, and maintenance) for projects bigger than 60 million euros. IPM and the divisions are the basis of RWS, a project organisation(Heijden, 2017). The contracts on the market facilitated this approach as well through DBFM(Design, Build, Maintenance, and finance), DB(Design and Build), and Bouwteams(build teams). It challenged the contractor to offer more than just build for example through designing the project.

A study by Mckinsey (2019)pointed out that the current market approach didn't fit well with the future challenge. An increase in maintenance and renovation projects was expected due to assets approaching the end of their life cycle and a decrease in the need for adding new infrastructure(Mckinsey, 2019; Rijkswaterstaat, 2019, 2021). Parallel to this, the construction industry signalled a hard time dealing with the complex project due to insufficient pricing of risk/profit(TenderNed, 2024). Coupled with a long-term perspective due to the focus on individual project results, limited application of innovations and learning ability across projects, the occurrence of failure costs, and a shortage of personnel throughout the whole sector, there was a need to shift from project based working to data collecting and handling, program-based working, organising effectively, and managing multiple disciplines to collaborate integrally. Due to an increase in complexity and change to maintenance oriented tenders contracts had to be adjusted accordingly. In general, more collaboration and cooperation was sought to meet the demand(Rijkswaterstaat, 2024).

The demand for collaboration and cooperation rises and the integrated contracts forms seem favoured as the current contracts lessens the urge to bid from the contractors perspective

(Rijkswaterstaat, 2022). More specifically contracts need to facilitate different ways of organising the collaboration including a change in reward. The relationship is more central in this approach. The contracts that go along with a more centralised relationship are relational contracts. Relation between parties and people is vastly different. These contracts have existed for several years and been successful in various ways with different implementations and iterations to fit the relation among others (Rahman & Kumaraswamy, 2004). As the human component is more present RWS is experimenting with these contracts to get a better understanding and to see how the industry copes and reacts to different contracts. Relational contracts have always been around. However, now that relationships are considered increasingly important, this type of contract has become more common. The literature is rich enough to provide more guidance. However, practical implementation often remains elusive due to a lack of clarity and previous endeavours. Rijkswaterstaat recognised the shortcomings and tried a different approach through the development of singular IPM-teams (Rijkswaterstaat, 2023). Different projects were chosen to facilitate the new approach with one of them being programme WOUW.

The WOUW programme is a long term and complex program. They are tasked with the maintenance of the floodplains along the major rivers in the Netherlands, mapping the data, and help the transition to asset management. To govern the program a form of relational contracting is used. The chosen form consists of three project teams that include both people from the client and from the contractor (consisting of contractor combinations). The teams operate (as far as possible) autonomously and in the service of a client. The request involves managing a river branch with an asset management approach. This means a large working area with a demand for management, documentation, overview, digitisation and organisation for maintenance in the floodplains. The teams are challenged with the use of a relational contract to carry out the project over the 10 years.

1.2 Problem description

There is a shift to more relation-oriented contracts. Part of the solution is found in more collaboration and cooperation; the old transactional ways of contracting fall short. These contracts are not optimised for the more relation-oriented projects. Contracts like partnering, alliance, two-phase approach, and Bouwteams are more suitable and already in use. However, working with these 'relational' contracts, and success in project teams vary greatly. Till now, organisations and teams working with relational contracting have a general idea of what relational contracting could or should be. This understanding is mostly based on their gathered experience and with relational contracts. More specifically, the project teams seem to experience and develop themselves in some sort of relational contract. So, there is new knowledge and innovation happening without any way to measure and reflect upon. Literature reveals that the definition and principles are vaguely described and not universally agreed upon (Macchiavello, 2022; Nwajei, 2021). It results in different applications and results. A framework that helps in structuring the principles and adds a measurement tool. This would help in gaining insight in what is happening in relational contract in the teams, understanding how to work with it, and learn and develop to innovate further in contracting and governing projects.

1.3 Research context

1.3.1 Objective

The framework needs to provide clarity and strategic guidance in developing project teams in relational contracting. Therefore, this research will design a framework for measuring relational contracting in project teams. The research will use a qualitative approach to construct the frame with the help maturity literature and a case study to give substance to the framework.

1.3.2 Research design

Firstly, this research involves a literature review in which the available literature on relational contracting and maturity model(MM) is explored to get a better understanding of the subject to determine the frame in which the substance needs to be structured. This forms the frame to scope relational contract in. The columns reflect components of a relational contract and the rows are the maturity levels. To fill the frame, data is collected from interviews with relational contract practitioners. Their insights and knowledge provides the meaning and illustration of the maturity level per component. The whole design is shown in Figure 1.

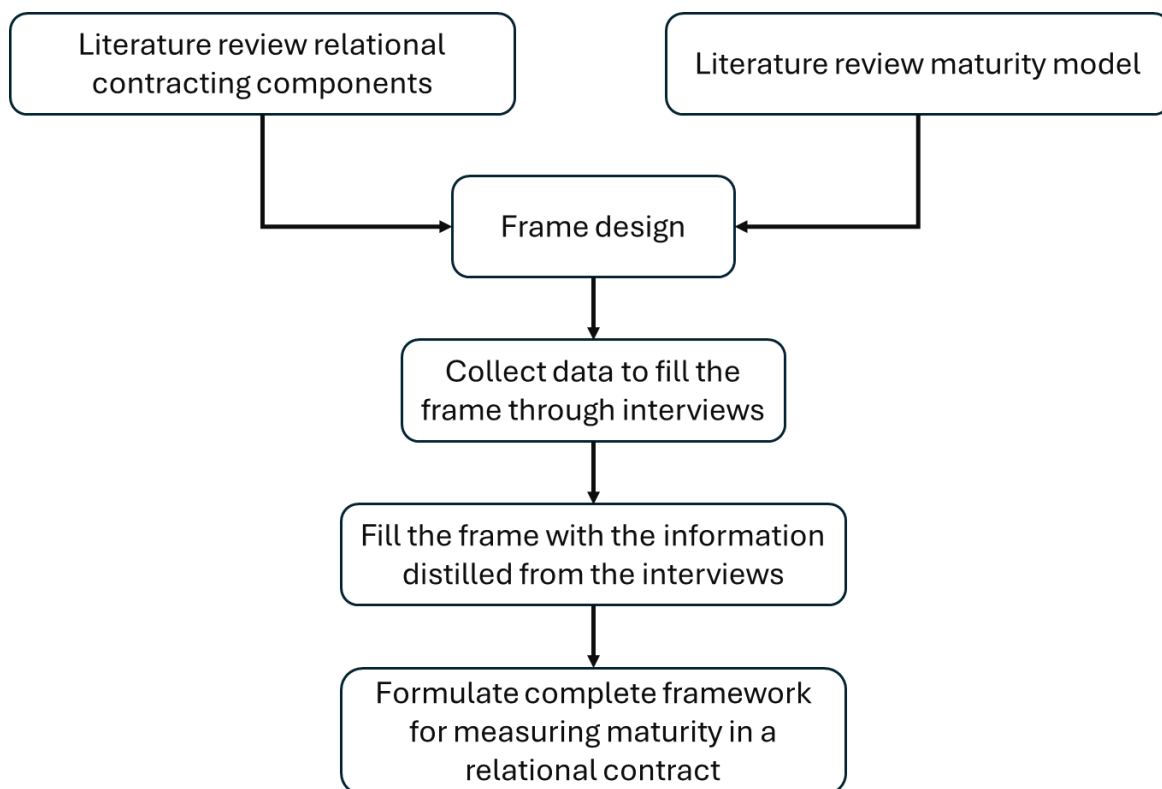


Figure 1 Research design

1.3.3 Scope

This research focuses project teams working in infrastructure as the basis for developing the framework. The project characteristics are multi-year, a degree of repeatability, high complexity and teams have some degree of autonomy to give substance to the project as they see fit. Further, the project is using a relational contract to realise the project and achieve the goals set and expected.

1.3.4 Research question

The framework needs to measure maturity in relational contracting. Here the framework is engineered to include maturity and relational contracting and reflect the maturity steps in every component of relational contracting. Therefore, the following research question can be formulated:

How to measure maturity in relational contracting of infrastructure project teams?

Complementing the main research question:

1. How are the components of relational contracting reflected in maturity levels?
 - a. What are the relational contracting components?
 - b. How does a maturity model suit project teams that use relational contracting?
 - c. How does the maturity scale look like for a relational contract of a project team?
2. How is maturity in a relational contract formulated by practitioners?
3. How does relational contracting maturity framework derived from literature and practice look like?

1.3.5 Relevance

In literature, relational contracting is conceptualised in multiple ways by finding a definition, describing it from different perspectives, and comparing it to other contracting ways. The next step is to interpret it and develop it in something useable. Thus, the academic contribution is a framework that combines relational contracting literature into a frame and connect it with the practical implications. Serving as a first model to combine relational contracting and maturity thinking to measure maturity in project teams who uses relational contracting.

From a practical perspective, the research will help to promote and create a higher general understanding of what relational contracting is. Further, a project team has a better insight into where their current development state and where growth is possible in the future. This helps the project team in becoming more aware of what they can gain and where to develop.

2 Literature review

In the following chapters, the literature behind relational contracting and MMs is explored. The purpose of this review is to distil the structure and components of relational contracting and to propose for fitting MM structure for the framework.

2.1 Relational contracting meaning

2.1.1 Definition of relational contracting

A relational contract (RT) is more focused on the relationship between the client and the contractor in order to get the best out of both parties' abilities. It has been in development since 1960, with growing demand since the turn of the century. It can now also be seen as a well-known approach, as the idea is no longer in its infancy. As it gets even more attention, more research is conducted into what exactly it is and how it works (Nwajei, 2021).

However, the definition of relational contracting is not universally defined. Overtime multiple versions have been presented from different perspectives. According to Rowlinson and Cheung (2004), RC is defined as:

'the value chain and the linking of interdependent parts within the construction project as an important business objective'

Value is developed in mutual benefits and win-win scenarios achieved through collaborative relationships. The incentive to collaborate is therefore value creation for everyone involved. Macchiavello (2022) defined RC from an economic perspective. Stated that it can be viewed as long term relationships based on trust while arguing that the definition from Baker, Gibbons, and Murphy (2002) would fit for a relational contract which goes as follows:

'A relational contract thus allows the parties to utilize their detailed knowledge of their specific situation and to adapt to new information as it becomes available. For the same reasons, however, relational contracts cannot be enforced by a third party and so must be self-enforcing: the value of the future relationship must be sufficiently large that neither party wishes to renege.'

The definition highlights the utilization of detailed knowledge, adaptation, self-enforcement, and the value of future relationships. However it does not refer to a more project oriented setting due to the focus on firms. Nwajei (2021) does focus the definition on relational contract projects and specifies the definition further:

'a two-part contract that seeks to describe the legal obligations and how the relationships will be governed between parties allowing stakeholders the power to govern themselves by using the contract as a mechanism towards flexible adjustment to change. A mini-society is created, which handles dispute resolution by avoiding litigation in the first instance and shares risks to a point where it creates stakeholders of the project.'

It involves the obligations, governance of relationship, use of contract, and dispute resolution through risk sharing. The definition acknowledges the project setting more through the governance and use of dispute resolution. Furthermore, the research where the definition originates from takes inspiration from I.R. Macniel work. Based on the ten norm proposed by

Macneil (1973) the relational contract theory has evolved from its original form to how it is presented. For this study, the definition of Nwajei (2021) is used.

2.1.2 Structure of relational contracting

RC is a more collective term for relation-oriented contracts. Two-phase approaches, construction teams, partnering and alliances are frequently mentioned under the umbrella of RC(Kadefors et al., 2024; Nwajei, 2021; Zhang & et al., 2020). However, the many variants show that there are differences between relational contracts. It is not only the contracts that differ, but also the definition of RC. Many researchers have interpreted RC from different industries and perspectives. One of the most recent interpretations was provided by Nwajei (2021), who bases her work on the findings of Macneil (1973). In her interpretation, RC is seen as a kind of philosophy in which there is a distinction between relational governance, Rc, and a collaborative contract, as shown in Figure 2. This distinction between the three provides a more specific view in RC, namely, Rc.

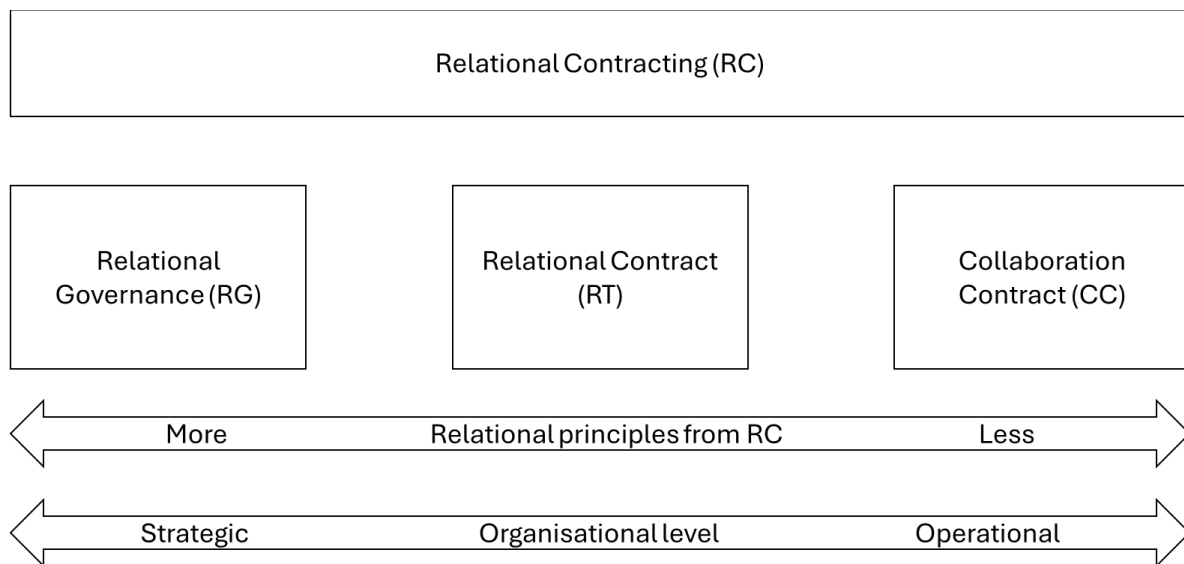


Figure 2 Differentiation relational contracting(Nwajei, 2021)

As mentioned previously, RC is a collective term and can be divided into three different forms. Each needs to be further explored for a better understanding of RC as presented below.

The first is relational governance(RG), which is not so much a form of contract. But rather a way of governing within an organisation and therefore applies to the relationships between organisations on a strategic level and heavily based on the RC principles. Here, the relationship between parties is managed on the basis of jointly accepted social guidelines (Macaulay, 1963).

The second, an RT, amounts to a contract that observes the principles of RC as a philosophy and implements them in an appropriate manner (Ling, Ong, Ke, Wang, & Zou, 2014; Yeung, Chan, & Chan, 2012). The principles described are the recognition of mutual benefits and win-win situations through cooperative relationships between parties(Rahman & Kumaraswamy, 2004). These are applied in different ways and explain the different forms of an RT (Ling et al., 2014). However, due to the lack of definition and clarity, the required

knowledge must be higher in advance. The correct implementation of an RT is dependent on this knowledge (Rosander & Kadefors, 2023).

The last in RC's selection is a collaboration contract (CC) in the form of performance contracts on the project level. The underlying idea is that payment is linked to performance. The payment incentivises the work and is reflected in both transactional and relational aspects. The idea is that the relational aspect of the contract should offer more trust and a better relationship. The contractual aspect helps to shape performance by setting out requirements in process and engineering (Nwajei, 2021). In comparison with an RT, the performance measurements are drawn up jointly in an RT, whereas performance contracts are drawn up by the owner/client, in which the latter is a more descriptive and unilateral contract (Levin, 2003; Nwajei, 2021).

2.2 Relational contract components

Having explored the different forms, a more targeted approach is taken to define an RT and derive components. By drawing up a comparison with a transactional contract (TC), the differences and components can be noticed.

A TC, such as Design and Build and UAV 2012, focus primarily on the transaction in a contract. As a result, there is little to no detail in the relational part, where collaboration between the parties can be formed (Willis & Alves, 2019). These contracts focus heavily on price, detailing what must be delivered for the price and working according to the project plan. TC, therefore, attempt to determine and describe everything in advance, meaning that every expectation and agreement must be put on paper. The result is a contract without flexibility that is complex and leaves no room for unexpected events or risks. Since not everything can be described in advance, especially in highly complex situations, this can result in dissatisfaction on the part of both the client and the contractor. This can lead to disputes and even legal battles. At that stage, people are no longer concerned with the purpose of the original contract. Time and money are spent on resolving disputes. In high complexity projects, effort is put into seeking a better relationship through different structures like RC (Engerbø et al., 2020). Frydlinger, Vitasek, Bergman, and Cummins (2021) defined an RT by comparing it to a TC. They point out that this is a simplification and that the comparison is based on the 5 most significant differences.

1. Focus on the deal or relationship

The focus on the relationship involves (social) cooperation. The underlying reason is therefore to create value for the parties involved. It is expressed in honesty and consideration for long-term interests, as goals, targets, and guidelines for the relationship. This is further safeguarded in the joint drafting of the governance to continuously bring the parties together. The contract then serves as a building block and not as an end goal to be fulfilled, in contrast to a TC.

2. Perspective of the relationship at arm's length or as partners

An RT focuses on cooperation between parties, as opposed to working at arm's length based on a TC. This is further elaborated on by social norms, which each party agrees to and applies, as opposed to viewing each other's interests as equal to their own. The behaviour of the parties is therefore determined by the norms that have been established. For an RT, this

means that it focuses on moral obligations and trust, which ultimately can take the form of a mini society.

3. Social norms are closed or integrative

From one's own initiative, social aspects can be converted into contractual standards, some of which are listed below:

- reciprocity,
- autonomy,
- honesty,
- loyalty,
- equality,
- integrity

This approach is particularly helpful in cases of incompleteness in the contract, where it can provide more direction and support. Integrative behaviour is therefore bolstered by converting social norms into contractual guidance.

4. Limiting risk through power or aligning interests

In an RT, Risk management is interpreted as the risk of putting the relationship in peril. The threat of self-interest through opportunistic behaviour is often a major contributor. To counteract this, rules are primarily used to continuously align interests and expectations in order to prevent such behaviour. Joint goals and agreements, flexible pricing that facilitates fair and balanced finances, and robust governance address the potential cause of undesirable behaviour. The underlying principle is that if parties have as few conflicting interests as possible, there are fewer incentives to engage in opportunistic behaviour.

5. Expectations and planning are fully elaborated, or a flexible framework that can cope with change

The contract can either be flexible enough to accommodate the dynamics of the project or be fully elaborated on and planned. The flexibility can be facilitated by frameworks that serve as reference points and clearly define what is expected in the relationship. Finally, governance must be designed to accommodate changes based on the social norms and guiding principles that have been jointly established.

2.3 Relational contracting subcomponents

The components are further defined and divided in sub-components for detailing and deepening. It further helps in studying the underlying substance of the components and clarify the contents of the components.

2.3.1 Collaboration

Collaboration plays a major role in an RT. Collaboration is one of the recurring themes in RT and the focus on relation and perspective as partners can both be seen as part of collaboration. So for simplification purposes and reasons, focus on relation and perspective as partners are combined into collaboration. In the line of reasoning, seeing each other as partners and focussing on the relation promotes collaboration, leading to a better end result in a contract. According to Thomson, Perry, and Miller (2009), collaboration is a process in which autonomous or semi-autonomous actors integrate with each other through formal and informal negotiations, jointly creating rules and structures for their relationships and ways of acting or deciding on the issues that brought them together; it is a process that involves shared norms and mutually beneficial interactions. The parties agree upon a certain way of collaboration they seem fit. If it seems that there is distance between parties but still agreement it could certainly follow the view of Thomson et al. (2009).

Nikulina, Volker, and Bosch-Rekvelde (2022) concluded that there are both relational and formal aspects to a collaboration. The concept they have established is divided into:

- Formal integrative mechanisms:
 - Governance and Administration,
 - Support,
 - Joint work activities
- Relational norms:
 - Win-win philosophy,
 - Shared vision and values,
 - Commitment,
 - Transparency,
 - Trust

This structures collaboration further in formal and relational aspects. The formal side helps with the formalisation of the benefits and purpose of the collaboration. At the same time, the relational norms help to improve the agreement and problem-solving in the relationship. Thus collaboration can be seen as a component because for collaboration, people choose to see each other in a certain relationship. This relationship is characterised by value creation, as otherwise there would be no rational benefit to collaborating. By entering into a relationship with each other, it takes on a more prominent position. People see each other as partners rather than at arm's length. This is because the standards are accepted and implemented by everyone. So the focus on the relationship and seeing each other as partners has an effect on the collaboration.

Additionally, collaboration is not limited to the team itself, but also takes place outside the project team. A high level of collaboration in and outside the team comes at the expense of the effectiveness of the team. Here, a continuous balancing act between effectiveness and collaboration takes place (Cha, Kim, Lee, & Bachrach, 2015). Therefore, collaboration is not

the end goals in a RT due to trade off in effectively fulfilling the contract(Hu, Hinds, Valentine, & Bernstein, 2022).

2.3.2 Embedded social norms

Project work is done by people and therefore their behaviour matters(Werner, 2018). The types of contracts influence behaviour, or vice versa. For a contract to work optimally, it must be tailored to behaviour. That is why it can be decisive for collaboration and mutual understanding(Galvin, Tywoniak, & Sutherland, 2021). Social norms and values help to support the desired behaviour. Pruitt and Rubin (1986) propose a simple behavioural grid in which one's own interests and the interests of others are combined, as can be seen in Figure 3.

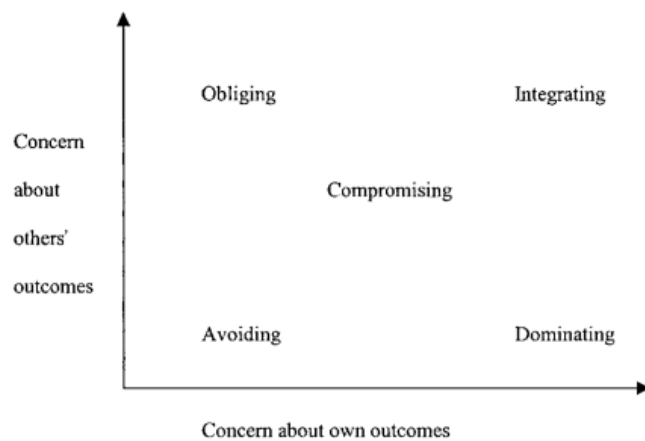


Figure 3 Dual concern model principle (Pruitt & Rubin, 1986)

To provide an example with the model in the context of the construction industry, the construction fraud that occurred just after the turn of the century will be used.

The behaviour in the projects was more focused on the self-interest of each party for self-preservation. This way of thinking leads to a tougher approach to the market with dominant behavioural characteristics such as coercion. It creates room for opportunistic behaviour, which in the long run hinders cooperation by disrupting the balance in the sector, which subsequently led to changes to restore this balance (Dorée, 2004). A hard approach can also manifest itself in avoidance and less problem-solving, which, in the long run, reduces team effectiveness by reducing cooperation(Baillien, Notelaers, & De Witte, 2008). Had the parties concerned been a bit more concerned about each other's interests, a more integrative behaviour could have been seen. Trust and honesty would have been more present, and a solution could have been constructed to solve problems.

Furthermore, the introduction of the mutual gain agreement in the RC principles which stems from the negotiation literature, deals with a careful analysis and management process based on experiments and cases (Anderson J., 1998; Orr, Emerson, & Keyes, 2008; Susskind & Landry, 1991). The aim of the approach is to maximise value in a project for all the stakeholders. This is achieved by taking the interests of the other party into account. Empathising with other stakeholders encourages integrative behaviour.

Trust is part of embedded social norms and has been mentioned in collaboration as well. In an RT trust plays a different role due to the social exchange theory(Zhang & et al., 2020). This theory works on the basis of self-regulation, which starts with a little trust. This incentive

leads to the encouragement of altruistic behaviour, which should ultimately be reciprocated. If there is no trust or only one-sided trust, social sanctions are used (Blau, 1964). It resembles the prisoner’s dilemma where two persons cannot communicate with each other and need to make a choice, do I confess or do I not confess (Mérő, 1998).

		Prisoner 1	
		Confess	Not confess
Prisoner 2	Confess	Both 1 year prison	10 years prison person 2 0 years prison person 1
	Not confess	10 years prison person 1 0 years prison person 2	Both 6 years prison

Figure 4 Prisoners dilemma

According to Figure 4, if both parties do not trust each other and do not confess, they receive a heavier punishment than if they did confess. It then seems rational to choose trust because both would benefit. But if one chooses opportunism by not confessing, and the other does, one is not punished, and the other is punished more severe than if that person hadn’t confessed. Trust would benefit both, and opportunism would rob each other of a better outcome.

A commonly used method to prevent opportunism is a formal contract in which the agreements made are linked to the law, which acts as an independent third party (Furmston & Tolhurst, 2010). This party manages the agreements made and prevents them from being unilaterally changed to the detriment of another party. This can therefore be seen as a TC. In a self-regulated contract, it is up to the parties themselves to adhere to the agreement made, as there is no party to manage it (Telser, 1980). An RT therefore makes use of this social exchange perspective.

2.3.3 Risk management

Galvin et al. (2021) approach collaboration from the argument that traditional contracts are subject to opportunism due to a focus on a transactional setup. The potential for collaboration could reduce the likelihood of opportunism by bringing together goals and sharing risk and profit. Governance, culture, and trust are seen as critical factors in reducing opportunism, as displayed in Figure 5. These aspects must be adapted to the project, especially in mega projects, in order to promote collaboration.

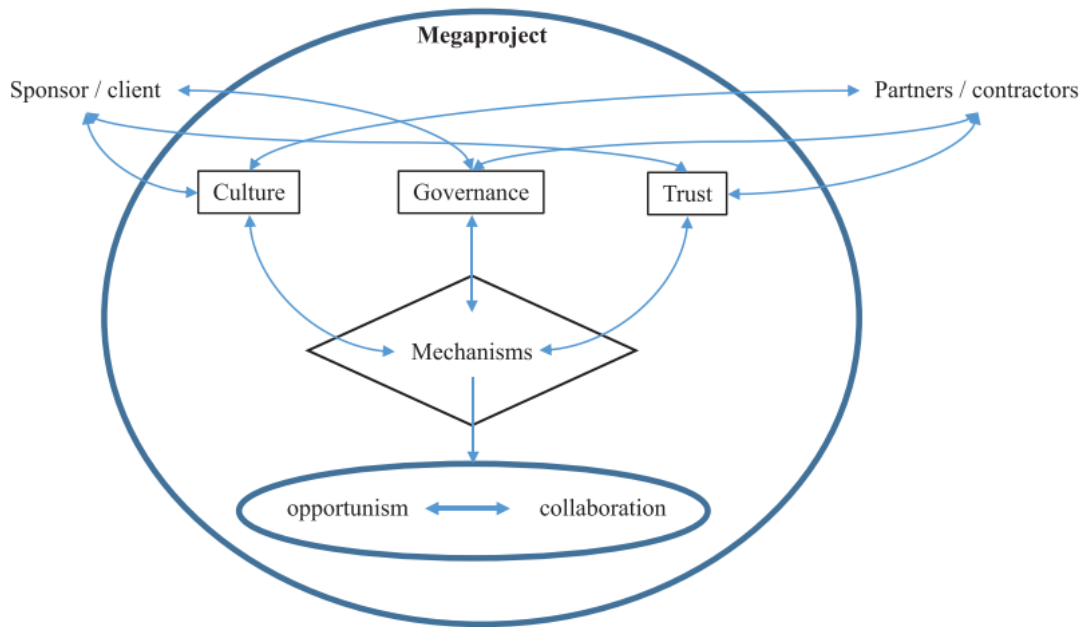


Figure 5 Interactions between the three pillars and mechanisms(Galvin et al., 2021)

In short, the risk is in governance and trust as two recurring themes. Governance is seen as encompassing rules, policies, processes and standards that coordinate joint activities from the perspective of cooperation(Thomson et al., 2009; Too & Weaver, 2014). Trust is a general theme in RC with a proposed definition in the form of ‘the willingness of one party to deal with another party in the belief that the actions of the other will be beneficial rather than detrimental to the first party, even though this cannot be guaranteed’ (Child & Faulkner, 1998). It means that trusting each other offers no guarantees but does offer opportunities in the future. To make these opportunities a common good, the goals and interests need to be aligned.

The culture within a team encompasses formal and informal cooperation. Governance largely determines what that culture will look like. The suitability of the culture indicates the extent to which the partners can work together efficiently(Johnson, 1988). Behaviour, values and norms must show a certain degree of similarity in order to create support from a win-win philosophy. Human behaviour, therefore, influences the culture, also known as the project atmosphere, which develops over time in a project team(Kroeber & Kluckhohn, 1952; Tjihuis, 2012). By being transparent and avoiding opportunism, trust can be earned. In turn, trust influences the project atmosphere. The project atmosphere, in turn, influences cooperation (Rowe, Te’Eni, & Merminod, 2023). In line with Frydlinger et al. (2021) risk is based on common goals & interests, win-win philosophy, and transparency and avoidance of opportunism. As the risks are applied to the workings of an RT and not the risk we normally associated with risk management it is renamed to relational risk allocation(RRA) to avoid confusion.

2.3.4 Governance

Governance can be divided into two types: the aforementioned relational governance and contractual governance(Cao & Lumineau, 2015; Mesquita & Lazzarini, 2008; Reuer & Ariño, 2007). Various theories are associated with RC, such as social exchange theory, which posits that the contract is enforced by all parties rather than by a third party, such as a higher court(Blau, 1964; Cropanzano & Mitchell, 2005; Warsen, 2021). Trust, open communication and information sharing are necessary and add value to the relationship between the various parties.

Contractual governance, as the name suggests, focuses more on managing the contract. Rational thinking in terms of performance indicators when drawing up a contract is a strong element in this form of governance. Relational and contractual governance appear to be opposed to each other, but should in fact be seen as complementary(Lu, Guo, Qian, He, & Xu, 2015; Yan & Zhang, 2020). In general, governance is influenced by the completeness and enforceability of a contract. Completeness helps to improve understanding, clarity and the creation of a good basis for trust. Enforceability can be seen as a substitute because it is functionally the same. In the long term, however, this can be harmful if it is not properly managed by the bad influence of enforcement(Yan & Zhang, 2020).

Looking further at the combination of relational and contractual governance, there is a distinction between informal and formal. Where relational is seen as informal, and contractual is formal. Keller, Lumineau, Mellewigt, and Ariño (2021) make a further comparison by using the ruling principle, in which the degree of codification is seen as informal and formal(McEvily, Soda, & Tortoriello, 2014). In this case, the agreement is formally recorded, while some commitments are made informally with a handshake(Ring & van de Ven, 1994). However, informal and formal are not exclusively linked to contractual and relational governance. The distinction between formal and informal lies in the codification of laws, rules, and agreements. Contractual is seen as the rights and obligations, in which formal refers to terminations, audits, or rights. Without codification, it is referred to as informal, which concerns confidentiality, division of tasks or information exchange. Looking at relational from a formal perspective, behavioural norms and values such as staff exchange, rules for decision-making or consultation procedures come into play. Informal boils down to trust and interpersonal relationships(Keller et al., 2021). This gives informal relational, formal relational, informal contractual, and formal contractual governance. For the coming chapter governance is referred to as relational project administration(RPA).

2.4 The relational contract structure

The main components in the theoretical analysis presented above are collaboration, RPA, embedded social norms, and RRA. These are included in the following table for the structure of an RT in Figure 6. The components are not exclusively applicable to an RT but can also be used in other contracts.

The table can be read from left to right. The contract form (column 2) is the breakdown as discussed in the previous chapter. Column 3 breaks down RT into various components as discussed above. There are four components that make up an RT. Collaboration, RPA, embedded social norms, and RRA. Collaboration is divided into purpose, relation, and benefits. RPA can be broken down into various forms that play a role in both relational and contractual terms. The embedded social norm primarily represents behaviour within the contract. Finally, RRA focuses primarily on what is needed to make the relational contract resistant to risks such as opportunism.

Contract form	Component	Sub-component	Definitions	Sourced from
Relational contract			"a two-part contract that seeks to describe the legal obligations and how the relationships will be governed between parties allowing stakeholders the power to govern themselves by using the contract as a mechanism towards flexible adjustment to change. A mini-society is created, which handles dispute resolution by avoiding litigation in the first instance and shares risks to a point where it creates stakeholders of the project." Nwajei (2021)	Nwajei (2021)
	Collaboration		"Collaboration is a process in which autonomous or semi-autonomous actors interact through formal and informal negotiation, jointly creating rules and structures governing their relationships and ways to act or decide on the issues that brought them together; it is a process involving shared norms and mutually beneficial interactions."	Thomson, Perry and Miller (2009)
		Perspective	"the reason for which something exists or is done, made, used, etc."	Frydinger, Vitasek, Bergman, and Cummins (2021)
		Relation	"the proper or accurate point of view or the ability to see it"	Frydinger, Vitasek, Bergman, and Cummins (2021)
	Relational project administration		"The comprehensive rules, policies, processes and standards to coordinate joint activities with a view to cooperation in the context of relational contracts."	Too & Weaver (2014)
		Informal relational	"the set of uncodified patterns of behavior to which parties are expected to conform; for example, trust and positive interpersonal relationships."	Keller, Lumineau, Mellewig, and Ariño (2021) & McEvily, Soda, & Tortoriello, 2014
		Formal relational	"the set of codified patterns of behavior to which parties are expected to conform; for example, exchange of personnel, decision-making rules, or meeting procedures."	Keller, Lumineau, Mellewig, and Ariño (2021) & McEvily, Soda, & Tortoriello, 2015
		Informal contractual	"the set of uncodified enforceable promises that define the rights and obligations of the parties; for example, confidentiality arrangements, task division, or decision making."	Keller, Lumineau, Mellewig, and Ariño (2021) & McEvily, Soda, & Tortoriello, 2016
		Formal contractual	"the set of codified enforceable promises that define the rights and obligations of the parties; for example, termination, auditing, or lawsuit provisions."	Keller, Lumineau, Mellewig, and Ariño (2021) & McEvily, Soda, & Tortoriello, 2017
	Embedded social norms		"an amalgam of the cultures of the constituent organizations (...) as transmitted to the project by their more powerful agents" "a broad concept and may be observed across various aspects of organizational operations—the rituals and routines, the stories, symbols, power structures, control systems and organizational structures"	Dworkin (1986), Frydinger, Vitasek, Bergman, and Cummins (2021)
		Reciprocity	"behaviour in which two people or groups of people give each other help and advantages" (cambridge dictionary)	Dworkin (1986), Cha, Kim, Lee, & Bachrach, (2015); Hu, Hinds, Valentine, & Bernstein, (2022)
		Autonomy	"independent and having the power to make your own decisions"(cambridge dictionary)	Dworkin (1986) & Thomson, Perry, and Miller (2009)
		Loyalty	"the norms of reciprocity and solidarity, which is called "loyalty""	Dworkin (1986) & Macneil, Ian R; J.S. Cal. l. Rev. 1973
		Honesty	"The requirement of honesty, therefore, not only forbids the use of inaccurate and deliberately misleading information but also implies that ultimately all relevant information should be disclosed, though the timing of disclosure may be a matter of judgement."	Dworkin (1986) & J. J. Quinn (1996)
		Equality	"someone or something that has the same importance as someone or something else and deserves the same treatment" (cambridge dictionary)	Dworkin (1986)
		Integrity	"Collective concerns overriding individual concerns; complex and multidimensional roles"	Dworkin (1986) & Nwajei, Una Obiose Kriston (2021)
		Trust	"The willingness of one party to relate with another in the belief that the other's actions will be beneficial rather than detrimental to the first party, even though this cannot be guaranteed"	Child & Faulkner (1998), & Nikulina, Volker, and Bosch-Rekveltdt (2022)
	Relational risk allocation		"the parties try to reduce risks by adopting rules intended to keep their interests and expectations continuously aligned.(...) If the parties do not have conflicting interests, there will be no opportunistic behavior."	Frydinger, Vitasek, Bergman, and Cummins (2021)
		Common goals & interest	"Existence of common objectives and agreement about ways to achieve them is key for collaboration success "	Nwajei (2021), Yeung (2012)
		(avoidance of) opportunism	"self interest seeking with guile "	Baker, Gibbons, & Murphy (2002), Méré, (1998), (Williamson, 1993)
		Win-win philosophy	"As parties are interdependent, they together can reach a goal that they cannot reach individually" "Neither party wins if others lose; recognition of mutual benefits"	Nikulina, Volker, and Bosch-Rekveltdt (2022), Thomson (2009) Yeung (2012)
		Transparancy	"Each party needs to balance its independence and collaboration, and share information necessary for the success of collaborative exchange"	Nikulina, Volker, and Bosch-Rekveltdt (2022) & Thomson (2009)

Figure 6 Structure and definitions of relational contracting

2.5 Project management maturity

2.5.1 Models

The definition of project management maturity is not universally accepted. Due to differences in organisations and industries, it is specific to that organisation (Kerzner, 2019). A proposed general definition: the maturity level reflects the success of the project as a result of the effectiveness of the organisation's project management (Carvalho, Patah, & Bido, 2015; Yazici, 2020). Project management maturity can therefore be specifically related to an industry or organisation and involves different dimensions of maturity to clarify the strategy.

Between 2009 and 2019, there were 296 studies on project management MMs (Fabbro & Tonchia, 2021). A number of different models are classified into: leading PM organisations, most cited and validated, and most recent models. A trend in all models is maturity, defined in five levels (Williams, Robertson, Haritonov, & Strutt, 2003). Each level is defined by characteristics and a specific approach. Maturity is assessed at different levels within the organisation, on an individual, project and organisational basis. The first models are simpler, generic and easier to apply. They are still based on a holistic definition, whereby a more tailored approach can be applied with the inclusion of five levels and different layers of the organisation. Later models are considered more complex and follow a more targeted approach to assessing maturity. As a result, they are also seen as inflexible and inadequate assessment tools (Karim, Ong, & Muhamad, 2023). Machado, Duarte, Amaral, and Barros (2021) studied the construction industry with regard to project management maturity and listed nine models used in the industry:

1. OPM3 from PMI (Organizational Project Management Maturity Model)
2. CMMI from SEI (Capability Maturity Model Integration)
3. SPICE (Software Process Improvement and Capability dEtermination)
4. P2MM from OGC (Prince2 Maturity Model)
5. PMM from PMSolutions (Project Maturity Model)
6. PM2 from Berkeley (Project Management Process Maturity Model)
7. MMGP from Prado (PMMM-Project Management Maturity Model)
8. P3M3 (Portfolio, Program and Project Management Maturity Model)
9. PMM from Kerzner (KPMMM-Kerzner's Project Management Maturity Model)

The analysis of the literature review was based on the use of selection criteria and inspired by the work of Kwak, Sadatsafavi, Walewski, and Williams (2015). The preconditions and potential factors identified by the authors resulted in the proposal that OPM3 (due to developments and citations) and MMGP (due to positive comments and no negative comments) were considered most suitable for use in the construction industry.

OPM3 has been developed by PMI (Project Management Institute). The core of the model is based on knowledge, assessment and development with the aim of providing an approach that allows maturity to be measured against current best practice. It is therefore primarily at a more strategic level, which helps in choosing which best practice to adopt and seeking improvement (Farrokh & Mansur, 2013). MMGP Prado focuses more on a specific part of an organisation. Unlike OPM3, MMGP Prado uses more categories: competencies in project management, competencies in technical and contextual aspects, behavioural components,

method use, computerisation, use of a simple organisational structure, and strategic alignment(Prado, 2016). This makes it a much more targeted model.

Figure 7 provides five different maturity levels. OPM3 bases its maturity levels primarily on processes and links recommendations and KPIs to them. MMGP is not and is mainly used as a snapshot.

Level	OPM3	MMGP
5	Optimized	Optimized
4	Managed	Managed
3	Institutionalized	Standardized
2	Structured	Known
1	Initial	Initial

Figure 7 Levels of maturity

Due to its focus and underlying working method, OPM3 is more complex than MMGP. Since it is primarily intended for general use and is organisationally structured, this explains its high complexity compared to MMGP, which does not focus entirely on the organisation but also on what lies beneath it. This is further supported by the data collection methods, with OPM3 using 125 questions and MMGP using 40 questions (Araújo & Ribeiro, 2021).

Looking at the context of the research, MMGP seems more appropriate than OPM3. The model focuses on a part of the organisation, such as a project team. Since the scope of this research focuses on project teams, it is thus more appropriate. In addition, the MMGP model is more focused on operational functioning within the team than OPM3, which takes a higher-level, strategic approach.

2.5.2 MMGP Prado

MMGP Prado was created around the turn of the century. The last update dates from December 2024. The change in the model brought about a restructuring of the dimensions that project management has come to see as a separate competence. In addition, informatisation has been converted to computerisation, and contextual competence has been added to technical competence. The most recent classification is:

- Project management competence
- Technical & contextual competence
- Behavioural competence
- Methodology
- Computerization
- Strategic alignment
- Organisational structure

Visualised according to the developers of the model in Figure 8.

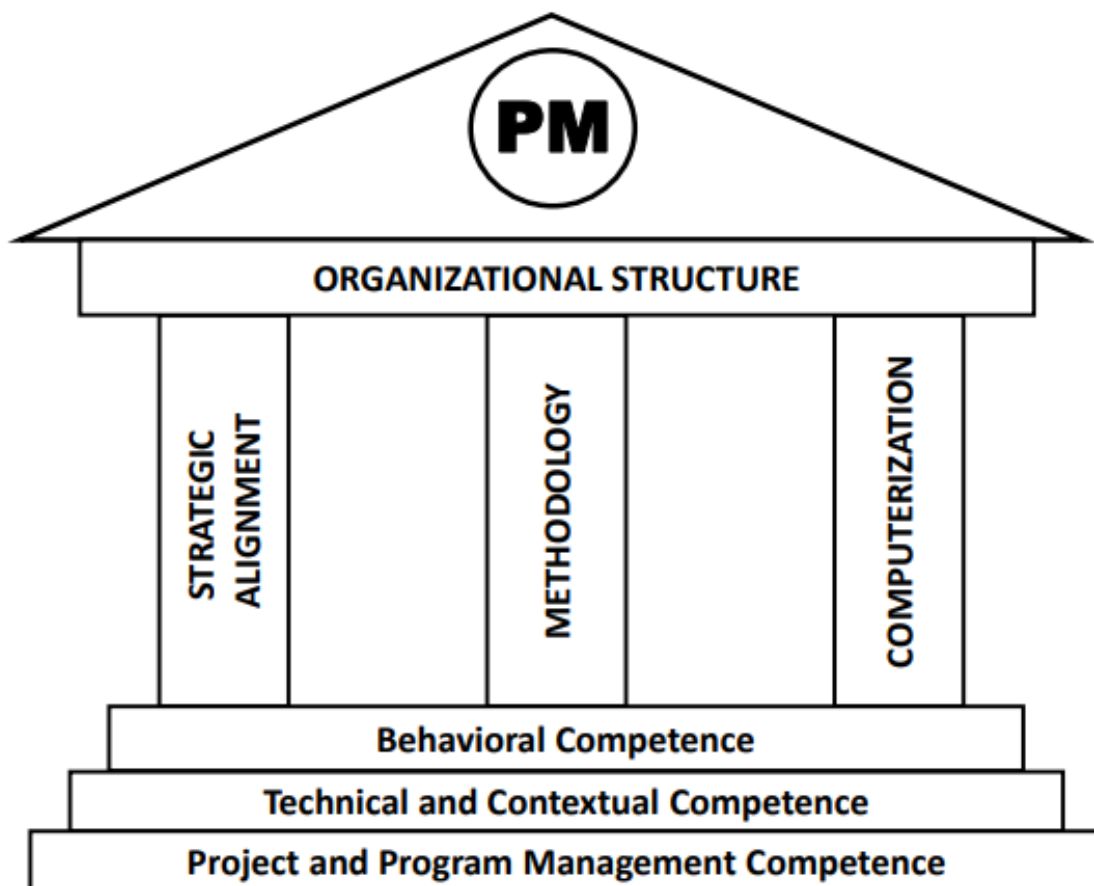


Figure 8 Seven dimensions of maturity (Archibald, 2014)

PM competence is seen as knowledge and experience of the aspects presented in PMI PMBOK or IPMA. Meaning that in this model, knowledge of PM alone is not enough for maturity in the model (Archibald, 2014). Technical, contextual and behavioural competencies also play a role, with the first two being mainly content-related and the latter being more people-oriented. The pillars that support the organisation mainly outline the way of working, the automation in the organisation and the alignment between the project and the

organisation. Noteworthy here is the focus on automation and the decision-making process to support the methodology and coordination in the recording. The organisational structure is depicted as a connecting and overarching “roof”. In this structure, functions are assigned, rules are established, and the influence of project managers is regulated between different bodies within the organisation. Versions prior to 2014 used six dimensions instead of seven. The competence dimension was added later, and other components were slightly modified. This study uses the latest version with the competence dimension.

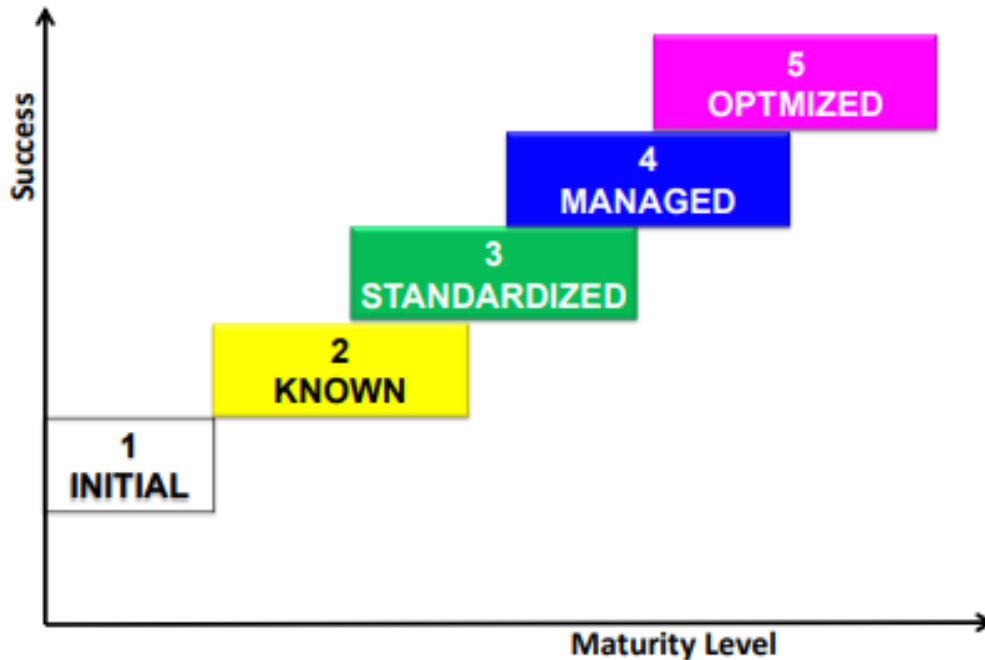


Figure 9 Maturity levels in relation to project success

MMGP uses a survey that indicates the general functions for each level. In every level, there are ten closed questions. These questions present a statement with five possible answers. The first option covers everything that is required for the maturity level. The options that follow are four incremental steps towards a lesser fulfilment of the first option. The statements are used to indicate how many points are awarded per maturity level. After forty questions, the points are awarded, and the total number of points reflects the maturity level.

Broadly speaking, the first level of maturity is for individual commitment and luck. The second level introduces principles, the use of tools, projects are planned, and people become aware of the importance of implementing a project management platform. At the next level, things are standardised, it runs for more than a year, general performance measurements, recording abnormalities and developing skills. The fourth level features a PM platform with results. Here, deviations are managed, competencies are consistent, and results are consistently delivered at the expected level. At the highest level of maturity, there are continuous improvements and innovations in technology and processes. This should achieve high efficiency in work through high productivity and low stress. Figure 9 shows that the levels overlap to a certain extent when it comes to maturity. This means that the level does not have to be fully completed in order to develop the next step.

2.6 Relational contract components in existing maturity model

MMGP uses the survey as input for the model. The model was created at a time when TC were widely used and RT was not that well-known. It can therefore be said that the model is largely geared towards TC. The model has undergone changes over time, with the latest in December 2024, constructing version 2.4. The question now remains how the model reflects the maturity of RC in practice. Each question in the survey is compared with the components of an RT from the literature. Components can be assigned to each question. This creates an overview that shows which question focuses on the maturity of an RT. Interviews can then be linked to each question based on the assigned components. This makes it possible to use the answers to the questions and see how they contribute to an RT. After the questions and answers have been examined in the context of an RT, the output of the model can be examined.

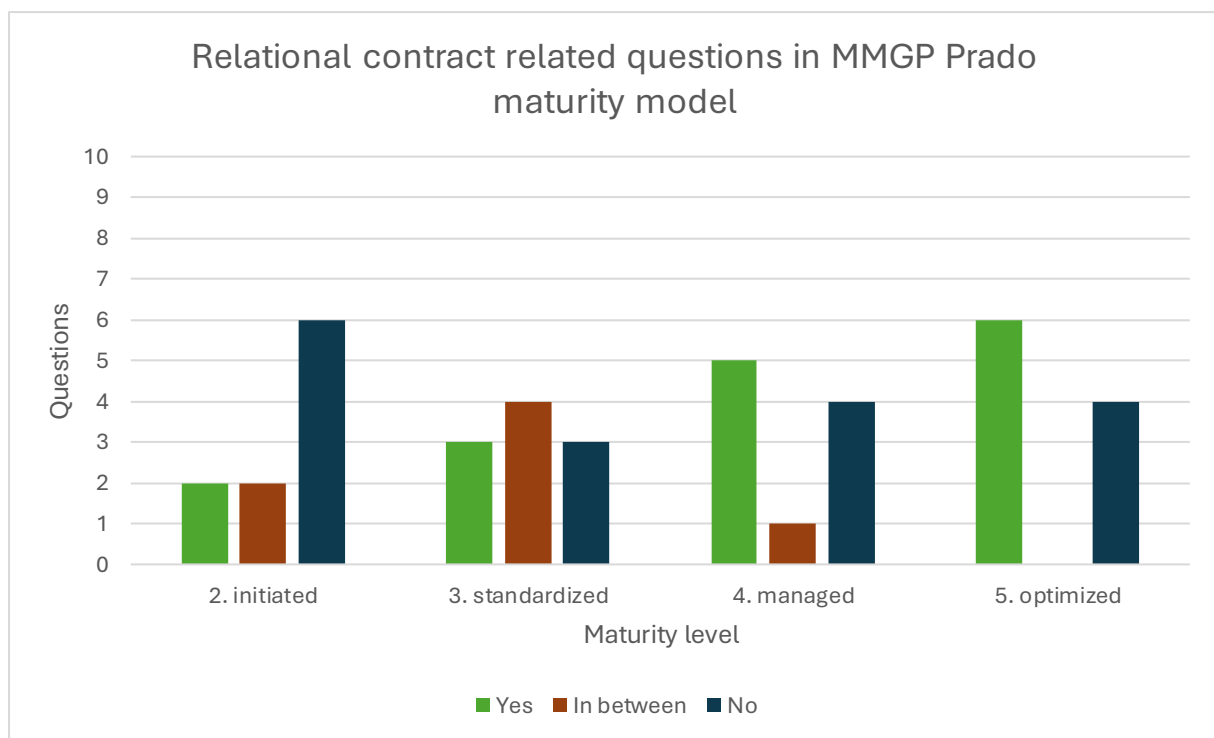


Figure 10 Distribution of related maturity questions to a relational contract

Figure 10 shows the distribution of the number of questions related to an RT. This was achieved by looking at a question and then assigning a component and, where possible, a sub-component to it. A general observation of the graph shows that as maturity increases, relational questions also increase. Levels 4 and 5 have almost no questions assigned to the 'In between' category and show a downward trend from level three onwards. The wording states that, once it is optimal or not, there is nothing in between. Questions that do not do this or are not unambiguous in this regard do not show any noticeable trend. The total number of questions related to an RT amounts to 23 questions. Therefore, the model in itself is not useful in the context of RT but can be of inspiration with the maturity levels for development.

2.7 Relational contract maturity model levels

The described maturity levels in the MMGP focuses on project management in larger teams and organisational units, which is applicable but does not cover all in an RT. More specifically, it matches most in terms of maturity stages in managing a project or organisational part. Components such as collaboration, RPA, and RRA therefore have strong similarities with this. The component that has less overlap is embedded social norms. It mainly provides a human perspective on a contract and how people interact with each other on a personal, team and organisational level. By using the MMGP as an inspiration and adding the missing embedded social norms to the maturity for the definition, all the components can be covered. This results in the characteristics as presented below:

Optimized

- Very high degree of implementation and integration
- Learning ability at personal, team and organisational level (e.g. PDCA)
- Analytical thinking
- Goal-oriented approach
- Trust at a level where processes are less necessary.

Managed

- High degree of implementation and integration
- Team and management support
- Control measures for aspects of the relational contract
- Reflection on measures from the standard
- Process/risk driven
- Improvement thinking
- Problem solving

Standardized

- Average implementation and integration
- Standard developed by the team
- Team success
- Assignment-driven
- Organising thinking
- Problem identification
- Contextualisation
- Team-wide mutual trust

Known

- Low implementation and integration
- Task-driven
- Task-oriented thinking
- Gathering information/building context

Initial

- Poor implementation and integration
- Lack of knowledge about the steps to be taken
- Lack of direction
- Individualistic thinking
- Actions based on gut feeling
- Lack of trust in each other

3 Methodology

3.1 Research design

The aim of this research is to design a framework for measuring maturity in project teams using relational contracting. Literature gave components of RT and applicable maturity levels. The meaning and interpretation of each level in each component has to be added to resonate with practice for measuring. Through collection of this knowledge from various project teams and implementing through the literature, a framework can be designed as visualised in Figure 11.

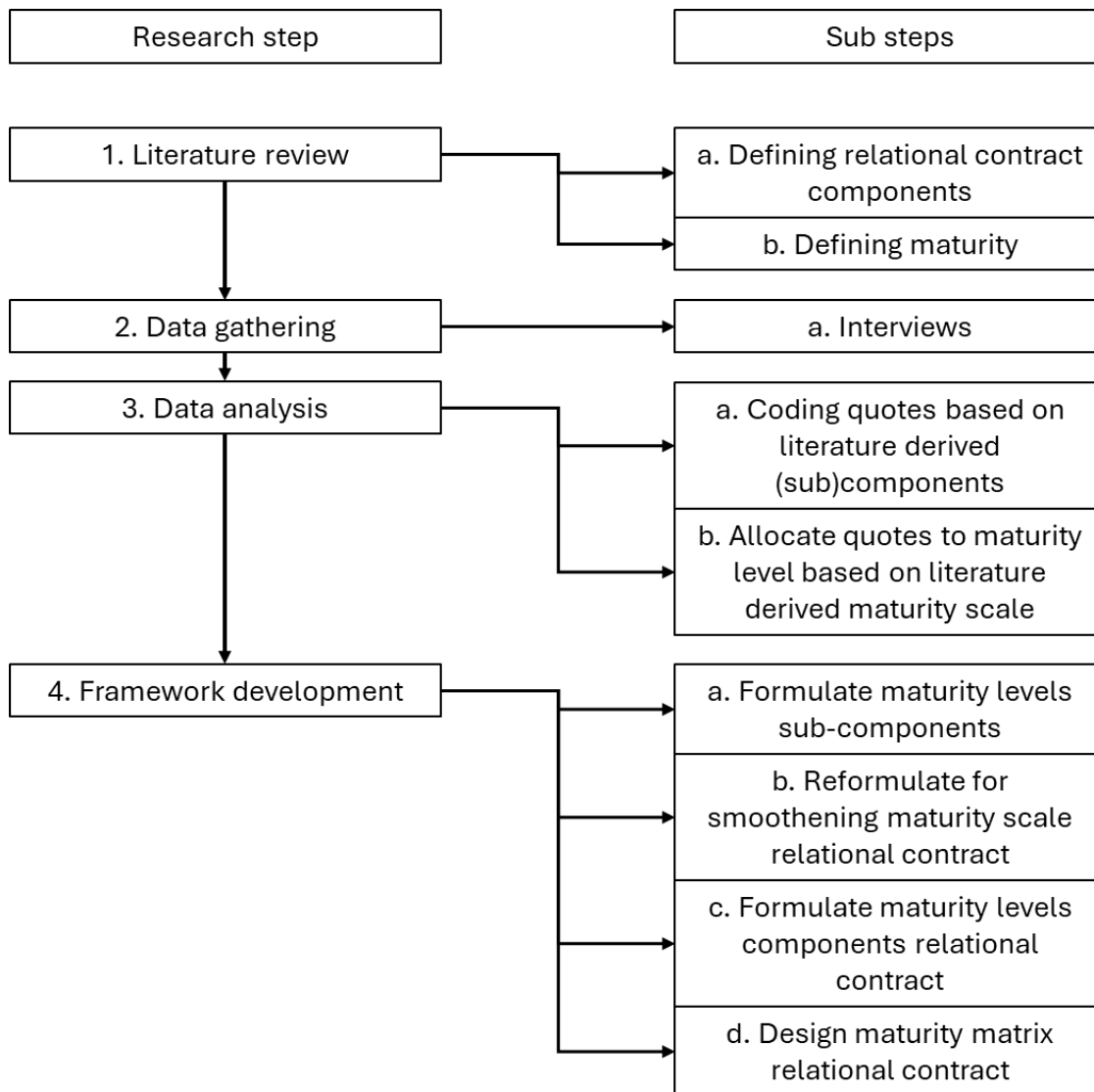


Figure 11 Overview of research steps

3.1.1 Data gathering

The WOUW programme is used to collect data from the field. WOUW stands for value-driven maintenance of floodplains and covers all floodplains of the IJssel, Maas and Rijn branches. This programme uses a relational contract based on a two-phase approach and uses contracts called WOCUs, also known as value-driven floodplain maintenance contracts, which work towards a common goal. The teams consist of a combination of people from different parent organisations to ensure that all interest are represented. They therefore see each other as task partners rather than client and contractor. Therefore, the traditional client-contractor relationship was not the starting point for the programme. Each year, a joint plan is drawn up with all task partners based on a fixed budget. The project team is challenged to engage in dialogue and prioritise what needs to be done to achieve the common goal. This requires flexibility on the part of the project team in order to continue to meet the common goal. The project teams work on the basis of a relational contract and can provide practical input for the content of the model based on their experience.

Interviews with the task partners from WOUW serve as the primary source of information in the framework. A semi-structured approach was chosen to conduct the interviews. The semi-structured approach allows for freedom to explore the answers given without diverging too much from the goal of the interviews. The method developed by Kallio, Pietilä, Johnson, and Kangasniemi (2016) was used to set up the questions and structure, and to ensure further reliability and validation. Each of the 18 interviews was on an individual basis and took about 30 to 60 minutes, depending on knowledge, experience, and acquaintance with a relational contract spread across 3 project teams. Of the 18 interviews, 17 interviews were held face-to-face and one was held online. Some roles were covered by different interviewees from different organisations but all project teams were in the program WOUW. Figure 12 shows the interviews conducted per project team and roles in the project team.

Project team 1			Project team 2			Project team 3		
Role	Organisation		Role	Organisation		Role	Organisation	
PM	Contractor		PM	Contractor		PM	Contractor	
TM	Contractor		TM	Contractor		TM	Contractor	
MpC/CM	Contractor		EM	Client	Contractor	EM	Client	Contractor
AM	Client		MpC	Contractor		MpC	Contractor	
			CM	Client		CM	Client	
						AM	Client	

Figure 12 Division of interviews

To streamline and structure the interviews, each interviewee was asked what they already knew. This would serve as the viewpoint of the interviewee. Next they were asked to classify the components of a relational contract. Here, their interpretation of a relational contract was asked and sketched to make it concrete to unravel the chain of thought. It would provide their unique interpretation over 3 different project teams with members from the client and contractor aiding in diversification and patterns later on. After establishing the components, a short explanation of a MM was provided. To detail the information further they were asked for defining the maturity levels in their own components. The goal of the last question was to encourage a clear defined and structure view of their own information as further explained in appendix Interview protocol relational contracting. The added benefit of sketching the components and levels helped in comparability of the levels between interviews for trends and patterns. The visual sketch was made with a whiteboard that was brought to all the face-

to-face interviews and online excel was used. After the interview the sketch was digitalised in excel as a picture. The interviews were recorded. Both the visual sketch and recording serve as primary data sources.

3.1.2 Data analysis

The interviews gave data in the form of a view of relational contracts as per the role-specific project team member maturity grid of the project team and quotes. After transcribing all the interviews information was generated from the interview. To distil useful information the components of relational contracts identified in the literature were used. They provided a frame to interpret the interviews in the context of relational contracting. The sub-components were converted into codes in advance. A deductive thematic approach was chosen(ATLAS.ti, 2025). This approach uses a top-down perspective and makes a comparison with the use of codes. The data is then interpreted through the theory. With the help of ATLAS.ti, the codes were assigned in the transcripts. After the analyses the quotes were translated into English and used to develop the framework further.

3.1.3 Frame development

A maturity matrix is designed based on the literature and interview data. The literature provides the frame in the form of components and sub-components. In the matrix, it is reflected in the columns. The interview data is used to formulate the maturity levels through comparison with maturity scale from literature as follows:

1. Assign quotations to sub-components based on coding
2. Assign quotes from sub-components to maturity levels based on a comparison of the content and the level distribution taken from literature.
3. Formulate maturity levels
4. Putting levels into perspective to find missing levels
5. Formulate levels that do not yet exist/have not yet been filled in, based on existing wording
6. Reformulate levels where necessary to achieve a smooth scale
7. Formulate maturity levels for each component based on the formulated subcomponents.

The result of the design process is per component a matrix with five maturity levels per sub-component and 5 levels of maturity based on the underlying sub-components per component as visualised in Figure 13. The five maturity levels are common in the existing models and there is no significant benefit in defining more or less in this case. Less would mean big jumps in distinctive characteristics and more would make it too small to notice.

	Perspective	Relation	Informal relational	Formal relational	Informal contractual	Formal contractual	Reciprocity	Autonomy	Loyalty	Honesty	Equality	Integrity	Trust	Common goals & interest	(avoidance of) opportunism	Win-win philosophy	Transparency
Optimized																	
Managed																	
Standardized																	
Known																	
Initial																	

	Collaboration	Relational project administration	Relational risk allocation	Embedded social norms
Optimized				
Managed				
Standardized				
Known				
Initial				

Figure 13 Visualisation of design process

4 Results

This chapter shows the results from the information gathering, structuring and the outcome of design.

4.1 Relation contract components

Having defined the characteristics of the levels, the columns(components) need to be defined. Collaboration is a major part of a relational contract and was already defined in purpose, relationship and benefits. RPA is the administration of the contract. A distinction is made here between informal and formal, and relational and contractual. Similar to collaboration, this does not need to be specified further to provide additional clarity.

RRA is less clear and broader. From the perspective of an RT, it looks at the risk that an RT will not succeed. That is why it is divided into common goals & interests, win-win philosophy, transparency, and avoidance of opportunism. In this case, transparency and avoidance of opportunism are combined because of the strong similarities in definition and the reduction of complexity in the matrix.

Finally, there are the embedded social norms, which represent the more human aspect in the columns. These are broken down into trust, autonomy, loyalty, reciprocity, integrity, and honesty. Loyalty and honesty are combined because reciprocity is part of loyalty, and integrity and honesty are also combined because, as in the previous combination, one is part of the other; namely, honesty is part of integrity. Equality is combined with autonomy because the interpretation often coincides in the interviews. The combination of the elements gives a simpler and clearer view and results in the following distribution of components.

4.2 Relation contract maturity matrices

In the coming paragraphs, the maturity matrix for each component is presented. Each paragraph covers one component (collaboration, relational project administration (RPA), relational risk allocation (RRA), and embedded social norms) with its subcomponents.

First the general overview with description of the sub-components maturity is provided. Derived from the sub-components a the components maturity is proposed. The following sub-paragraphs starts with a short description of the maturity related to the specific sub-component. Then an example of each maturity level of the sub-component is given with explanation. The result give the 4 component with 5 maturity levels based on the 13 sub-components with 5 maturity levels.

4.2.1 Collaboration

Collaboration		
	Perspective	Relation
Optimized	In addition to knowledge, collaboration also yields demonstrable benefits. It gives the affiliated parties greater confidence and reduces the need for control.	Continuous improvement in the relationship based on shared values, in which the contract is evaluated and adjusted for proper implementation.
Managed	Collaboration becomes more efficient and the shared project interest lifts the team out of the affiliated organisations.	The contract takes on a supporting role in which it establishes the value of cooperation that is in line with the team and organisations.
Standardized	A uniform approach has been defined to utilise and implement the knowledge and strengths of affiliated organisations within the team.	Rules are agreed upon for the collaboration and there is mutual understanding of each other's way of working.
Known	There is an agreement between the parties with clearly described conditions and deviation management.	There is no good balance between the relationship and clear agreements, and improvements in this area are mainly on an individual level.
Initial	From one's own perspective, one works with limited communication with strong characteristics of working at arm's length.	The desire for a relationship based on collaboration is driven by one's own perspective and needs.

Figure 14 Collaboration maturity matrix 1 of 4

Figure 14 shows the maturity matrix of component collaboration based upon the quotes. The quotes are presented below in the coming paragraphs. In general, people must understand each other first and realise that they are going to work together, and then make agreements on how this will be structured in a team. Through the levels, the underlying organisation becomes more involved, and the benefits of collaboration become clearer through providing more guidance. Ultimately, everyone benefits, and collaboration can be further developed. Based on the combination of sub-component maturity levels, the component maturity levels can be defined. Per maturity level in the sub-components, the component level was defined, giving the following:

Relational contracting

Optimized	The relation is continuously improved based on shared values, which aids in confidence and reduces control through a contract that is properly implemented.
Managed	Collaboration is effectively organised through a contract that incorporates values and shared interests.
Standardized	A uniform approach which includes how to collaborate and the effective use of each other's strengths through mutual understanding.
Known	The relation is not balanced in the agreement between the parties, and improvements are mainly made on an individual level.
Initial	The collaboration is very individually driven due to individual needs, which are characterised by poor communication and working at arm's length.

4.2.1.1 Perspective

The general view of the interviewees shows that the perspective on the relation goes from their own perspective to a broader perspective. By opening up the perspective, the approach changes and trust increases and the need for control lessens.

*"Hm, let's say that, for example, the collaboration would be established then. The collaboration is[...]completely based on[...] letting go and trust. That would be optimal in your view, if it is letting go and trust? Yes."*¹

In the interview with a CM an optimal situation for collaboration was to let go and trust from a contractual point of view. It signals a high level of trust in their abilities to manage and carry out the assignment. Letting go refers to not needing processes to control the partners for managing the results. This suits an optimised maturity level and is formulated as greater confidence and reduced need for control.

*"So, if you're talking about what exists in such a partnership[...] It is of course important that you can see each other's interests. That is, of course, the basis of the relational contracts, which are based on interests, so it is a matter of understanding each other's interests and actually taking ownership of each other's problems. [...] as a client, you have to understand that your supplier has to earn money. As a supplier, you have to understand that your client needs a service and has requirements and values associated with it."*¹

A MpC viewed the relationship as an understanding that both parties seek something from each other. By recognising each other as partners, collaborating closely, and identifying the needs, the profit will be higher. It resembles the efficiency gain through integration and improvement thinking, which connects it to a managed level of maturity.

*"Yes, so that's very much like[...], we're keeping the books closed, we're setting a budget, but you're not allowed to know what's in it, much more that way,[...]and in the meantime, steps are being taken again. Well, it's increasingly giving more insight into each other's work[...] So really, your consensus is that you just have the same line of thinking, and here you are much more in a position where you at least understand why certain things are in a budget."*¹

The EM indicates here that, where needed, they start to see each other as partners by showing information. So, when they needed, they saw each other more as partners. Although the line of thinking is in line, the rest is more context-dependent. This shows a standardised view of the relation by being uniform in thinking, but more secretive due to their own organisation.

*"[...]One is traditional[...] prescribed quantities, and this is what I want you to do, others who would actually like to collaborate, but are forced into a BOK contract. It is, well, I thought it was a step back in time. Yes, to get a list. [...]a bit of a step backwards. You get your own example[...] I have to do this. I'm done[...]and so we're going to have a discussion[...]dear client[...]you prescribe[...]100 trees, and I see 110. I want these 10 trees to be included, and not, "I have a budget, and we're going to do it as well as possible. [...] so we're actually going back from standard or perhaps known, because that was, of course, with a relational contracts such as a united single team."*¹

The TM made a comparison between an RT and a traditional contract. The perspective on the relation is that the traditional contract is a step back and should be considered as a known level of maturity in a relational contract. The task-driven and low implementation of collaboration suggests a certain distance between client and contractor.

*"Everyone on their own little island[...] Little islands that don't communicate with each other, thinking that the other person understands you without asking the check question[...]Do you think it will be alright? I also think the expectation is that everyone would do the same as you in a certain situation."*¹

¹ Dataset Collaboration part Perspective

A MpC used the “own little island” as a figure of speech to explain that not communicating and expecting understanding. The relation is seen as a really large distance between parties and people. It reflects individualistic thinking and acting on gut feeling. It is seen as the initial maturity level.

4.2.1.2 Relation

The general view of the interviewees shows that the focus on relation consists of referring from an individual perspective to a broad organisational perspective. The contract gets a more supportive role as the maturity increases through adding shared values.

“And yes[...] values that stem from the ambition document[...]it's fully mature, yes, then those values have simply been incorporated by the project teams. They act entirely according[...] you can disband the programme team.[...]The three plot teams can just work autonomously and just let them do their thing, then you can ask yourself, okay, what is your role now as[...]programme team?”²

The CM said that if the shared values are fully integrated into the project layer, in this case, a program team, the above can be removed. It signals continuous adjustment to get a solution that fits. Indirectly also the bigger picture for the long term is also presented by thinking from an organisational point through efficiency and implementation without the contract as a hurdle. As it poses very high implementation and continuous improvement, it suits the optimised level of maturity.

“Does it fit in, or does it help? It actually requires you to think about whether it fits in or helps in your daily activities, and that immediately makes you think about the contract value. [...]You just want to have that value secured, but of course that's also a value in itself[...]we're doing this for the greater good that hangs above us, so I think there's a maturity in that value and in the goal that you're just very aware of that contract value and how you commit to it and that you bring that back to something daily that it just becomes something normal.”²

The active consideration of how the contract is adding value is done by the MpC. It is not only based on the daily activities but also focused on the long-term implications. Adding to this is the awareness in the team and the reflection that comes with it. There is active management of what works and what does not.

“[...] is just a dredging company.[...]They're just good at that, so a project-based approach? [...] Yes, what makes this project so difficult is that there's a lot of history involved. That matter involves agreements from the past. This was done by RWS as a change in policy. All kinds of things that we couldn't have known about. So you know about that? Well, yes, we have more input from RWS, so it's a nice collaboration where everyone has a certain amount of input.”²

The EM acknowledges that some of the parties are just better in certain situations. A standard for what every party contributes to the project is developed. It suits all the different party organisations and what to expect from the relationship.

“[...] If the more you have to work together[...] do you just have it contractually? Do you just need more maturity? [...]”²

The MpC made a remark that to work together, it doesn't need to be just contractually. The involved parties need to be mature as well. Here, the awareness is there, but on an individual basis.

“That's not the case, but I think there are other things that come up,[...] And if you're really not mature at all, [...] you don't speak and understand each other's style at all, so you're actually communicating past each other.”²

² Dataset Collaboration part Relation

AAM mentioned that with no maturity, people communicate past each other. This is not in line with the focus on the relation and shows poor implementation and integration with the project. Therefore, it is symbolic of the initial maturity level.

The view of the interviewees shows that the focus on relation consists of referring from an individual perspective to a broad organisational perspective. The contract gets a more supportive role as the maturity increases through adding shared values.

4.2.2 Relational project administration

RPA				
	<i>Informal relational</i>	<i>Formal relational</i>	<i>Informal contractual</i>	<i>Formal contractual</i>
Optimized	Centralised relationship management by representing interests through honest communication and information provision at all levels among partners.	The choices are weighed up and reflected upon with all partners in order to achieve the best possible integration.	Agreements are made together with each need represented by the team, which is put together based on efficiency and takes full responsibility.	Legal obligations and rights outlined to tailor the contract and governance as closely as possible to the project and team.
Managed	Relationships between organisations are improving and prejudices are disappearing, but processes still reflect the lack of trust.	Joint decisions integrated with the partners, with reflection on whether it works.	Partners are aware of their responsibilities and the team no longer works with dual roles.	The contract is tailored to the assignment and views the law as a framework rather than a limitation.
Standardized	Trust within the team has been established and letting go is starting to happen through more informal relationships. Slight prejudices remain, but understanding is improving.	A joint team with people who help each other in decision-making processes and coordination. However, integration with partners is lacking.	Awareness of responsibilities as a team. The team still has dual roles so that partners can exert influence.	Joint procedures are followed with the law as the reference framework for the contract.
Known	A lack of trust makes the relationship formal and businesslike, accompanied by mistrust.	People begin to help each other individually in decision-making processes and start to integrate into the team.	Prescribed agreements on how work is carried out with people from other organisations who want to exert influence.	Lengthy amendment procedures involving a great deal of legal accountability and strict agreements.
Initial	Many shortcomings in personal and professional relationships and trust.	Procedures and initiatives based on personal judgement and lack of coordination with other individuals and the team.	Unilateral agreements that are rigidly formulated. These limit flexibility and are represented by someone from your own organisation.	No room in the contract to change and adapt, so only the minimum is done.

Figure 15 RPA maturity matrix 2 of 4

Figure 15 shows the maturity matrix for component RPA based upon the quotes. Low maturity generally presents a solitary picture in which everything is fixed and there is little room to manoeuvre. As maturity increases, RPA becomes less rigid and more integrated into relationships and contracts at various organisational levels among the partners. This also shows that relational and contractual aspects are not opposed to each other but coexist when it comes to maturity. Informal relational RPA. Based on the combination of sub-component maturity levels, the component maturity levels can be defined. Per maturity level in the sub-components, the component level was defined, giving the following:

Relational contracting

Optimized	The decisions are jointly made and tailored by using the contract as a tool to support integration and implementation.
Managed	Organisations surrounding the project teams are improving on relation and are more aware of what their responsibilities are and act accordingly.
Standardized	The project team has a joint decision-making process while every member is aware of their own and other responsibilities.
Known	People in the team have some individual relations and work with contract that are prescribing and lengthy.
Initial	Lack of coordination with prescribed contract and shortcomings in relation and trust.

4.2.2.1 Informal relational

The general view of the interviewees shows that the informal relational RPA lacks trust and personal shortcomings formalise the relationship. As that is improving honesty, and information is provided more among partners.

“Every time we discussed it with them. And yes, they were soberly honest about it. We just knew. We're not perfect. That doesn't matter, as long as we're aware of it and work on it. Yes, yes, well, that builds trust, and when you have that trust, then you can still get angry about something, but you keep talking, when people lose trust, or when it's damaged”³

The MpC explains that in the informal relationship, communication is important. The key to communication and interaction is honesty, providing the information, and the delivery of it. By showing transparency and accepting the emotions, the dialogue is kept alive and analytical thinking can still be applied to keep making progress to eventually reach the goal. This approach is aimed at the higher goal and keeps the individual concerns subordinate.

“What would be the optimal form of that trust?[...] ideal if you trust each other. [...] You have that a lot,[...] especially with maintenance. I have a lot of processes, so to speak, and they are there because they don't trust the end result,[...] So if there is no trust, then you say there are processes, and if they do trust, there are no processes, then you don't need them.”³

The TM sketched the trust vs amount of processes. The defined processes are a method to ensure a certain result through the control such a process gives. The more trust is instilled, the less process is needed. In the context of RPA, it means that the administration is done through a number of processes. Therefore, it is more process-driven and resembles the managed level of maturity.

“Transparency Yes, trust in each other yes, but a contractor may well think of the client as a nuisance. Why should that be? It's logical, isn't it? You know that mutual understanding, that he's sitting there with a [...] RWS cap and a different background, and vice versa, we have to shift now. We can't keep milking to the last euro. That's just the way it is[...] Yes, it can go very far, of course, yes, people dig their heels in [...] Yes, that's part of the learning process and experience.”³

The RT asks something different for the parties, as the CM explains. As every party is responsible for the result of the project. The standard is shifting, and everybody needs to adjust. A new approach is created with a new point of reference. The past is not fitting anymore as the behaviour of maximum profit is long-term term not profitable.

“Yes, so it's really, um, I can't trust you if you're not open with me. And if you're not open with me, then there's no equality. Then you're hiding something from me.”

The PM explains that for maturity, a certain degree of openness is needed between individuals. The thought of no equality entices secrecy and mistrust.

“[...]I'll call it stakeholder management, but that's not outside the team, it's within the team, within the project. After a while, you know who is responsible for what and where, so at the very beginning you're really searching for who is responsible for what. By now, we know pretty much who is responsible for what and also how the people who are responsible for that are wired.”³

The PM illustrates the initial point of informal relational maturity by literally stating that the beginning had a lack of direction in the organisation. Everybody knew nothing about the other, with no relation built. It takes time and skill to manage this on the team level and project level, and shortcomings are there from the start.

³ Dataset Governance part Informal relational

The view of the interviewees shows that the informal relational RPA lacks trust and personal shortcomings formalise the relationship. As that is improving honesty, and information is provided more among partners

4.2.2.2 Formal relational

The general view of the interviewees shows that those of lower maturity make more personal decisions. As the maturity increases, the decisions are joint and even reflected upon in the optimised state.

“So if you are mature as a partner[...] you do take that into consideration, but you also have other things to consider[...] you also think about long-term maintenance and impact[...]in the environment, you think about [...] long-term costs.”⁴

The EM look from an environmental view at the contract. Maturity is seen as considering other things as well, like long-term and the impact of the decision. It has to integrate properly to work as the project is environmentally very complex, with all the parties involved.

“Well, this is a completely different dynamic. If you're in the same team, yes, I believe that, but if you're not, well, the nice thing about learning from each other, for example, is that this contract is very much geared towards learning from each other's strengths in terms of knowledge and skills. [...] I see that the contractors are learning like crazy, [...] about how RWS functions. [...] I see that the RWS people within the team are learning. I see that the RWS organisation really isn't open to learning. [...]”⁴

The partners within the program seem to learn according to a MpC. They try to understand each other and make a decision as partners by reflecting on the effectiveness of the resolution. It shows improvement thinking and reflection attributes from the managed maturity level.

“Well, in any case, the collaboration here already involves two parties. You have two parties in one team. That is very important. And yes, with two parties, Team. Or rather, both Rijkswaterstaat and the commissioning partner, I think that is optimal collaboration. A joint team.”⁴

The PM sees a joint team as optimal collaboration. A joint team helps in decision making and coordination but further integration is missing due to not looking for improvements and a next step to take. In RPA perspective, it suits better as a standard maturity.

“Like a real old-school contractor mentality, so to speak. [...] Traditional is perhaps better described as simply how you used to do things. That worked fine, but the contracts are simply no longer in line with that, so it's time to start working in a different way. Basically a mismatch in mentality and contract”⁴

The CM reflected on the known maturity level through the awareness of the mentality. The decision-making in traditional contracts does not work in a RT, and a change is suggested to get more integration.

“Yes, I have nothing to do with this. And, well, we'll see where the ship runs aground, so would you say there's no support again[...] I think it's disinterest[...] you don't take ownership of it either[...] You don't feel responsible, and you see your part of the implementation, for example, really only as the implementation, while the contract manager is at his wits' end. Because, yes, a ton more is being spent[...]and you don't care. [...] I don't think that's very mature in a collaboration involving a whole contract. [...] This is related to each other and now you see the assignment implementation. [...] you're really on your own island in terms of implementation, that you're not looking at what else is possible[...] that you're not seeking collaboration, not learning from each other[...]”⁴

⁴ Dataset Governance part Formal relational

The MpC presented an immature view of interaction in a project team. The example presents individualistic traits with a lack of interest and concern about others. Actively not participating and collaborating with others shows the lowest level of maturity.

4.2.2.3 Informal contractual

The general view of the interviewees shows that agreements in the lower levels are more rigid and limited in flexibility. As the maturity increases, the agreements are more attuned to the team and based on efficiency for the team rather than an individual.

"[...] You can see that from the traditional roles we have all had in recent years. It is very difficult to sit on each other's chairs, and we really should do that, because in the teams as we have now set them up, we realised that there is actually no IPM team with mirrored roles, but purely asset management and environment. We do have roles, and the rest is just a bit of everything, in the hope that cross-pollination would take place so that the interests of the client and the contractor would intertwine, so that they would become owners together, manage the money pot together, and look at the requirements together, [...]."⁵

The intentions behind the choice in RPA is brought up by the TM. As the proposed team structure didn't bring what was needed. The cross-pollination was not the answer to intertwining the interests. By choosing to actively acknowledge that the solution did not work, another path was chosen to improve. This way of improvement and reflection makes it a managed maturity level.

"Ideally, you wouldn't have the colours of your own organisation [...] you wouldn't have to know whether you or someone else is from RWS or from the market [...] you wouldn't see any difference between them, you could say, uniform, [...] there should be no overlap in, so every role should actually be complete, [...] but it should be independent of who fills it."⁵

According to an AM the role should be independent of which party fills it in. In a RT it is good practice per assignment to pick someone for a certain role; however, for the long-term view, the dynamics in a project seek more awareness of who that a certain role has with the responsibilities. The RT is aimed at using each other's strengths, so it is more of a standard maturity level.

"[...] RAW contracts are about me asking you to do something. If you look at that from a small child's perspective, you say, 'Come on. Put on your trousers and check that you're doing it.' That's also the maturity you need for a contract like that. Yes, it literally describes what you have to do. Do this and I'll check the square metres, yes, yes, or the number of nails or the number of anchors or the number of cubic metres of cleaning, or just work through the list exactly like that. Once you've finished, you get paid, you just get paid. If you did more, you get paid more, and if you had less, you get paid less. [...] you just need a certain level of maturity or skill for that, and you need people who can do the job."⁵

The MpC describe a simpler contract with the maturity level. Here, a described and formulated to the detail contract lowering the amount of maturity needed. Everything is clear and defined with the attached processes. It requires some maturity to carry out the work, how to do it effectively, and decide whether it is profitable; therefore, a known maturity level is described.

The quotes didn't show an optimal and an initial level. These are developed from the other levels. In RPA optimal would be more mature than the awareness of each other's roles. The project team needs to be designed for efficiency and responsibility. All the parties need to be involved and agree on the design in order to obtain an implementation as high as possible. Initial maturity is very rigid and based on the known level, where the agreements are more

⁵ Dataset Governance part Informal contractual

unilateral and on an operational level. Due to the limited flexibility in the agreement, it has to be carried out by someone from the contracted organisation.

4.2.2.4 Formal contractual

The general view of the interviewees shows that on the lower maturity levels, only the minimum is done in order to fulfil the contract. The higher maturity levels show that the contract is more of a tool for structure and helps in clarification. Therefore is seen as a frame and not a limitation.

"[...]Well, it's really about sharing the risk according to your capacity[...] it also depends on who your partner is. But I think that's the most optimal solution. Yes, look, RWS is a very large party [...] as contractors, we can't bear that underlying danger or risk, can we? If that bridge collapses and those houseboats start moving again, then a large area will be flooded. [...]so I would say 50/50, but according to ability, and then yes, isn't it more RWS responsibility than ours? Let me put it this way. [...]I'm reasoning from a contractor's point of view, [...]but if you say according to capacity, then you just look at who can best take the risk, [...] RWS, yes, maybe it's just along the same lines as of buying off the risk, [...]"⁶

The PM is thinking about the best way of dividing contractual risks. The partners can help each other by taking risks according to ability, and see what works most effectively for everybody and the project. By looking from a different angle in an analytical way, the best fitting solution can be found together, as this is from a contractor's perspective and knows that not everybody thinks the same.

"[...] you had to describe how you set the price, but that was about it. So, in the end, I just agreed on the price collectively when the project started. Because, in particular, the starting points. These are the prices of the companies, the unit rates, the hourly rates, so in the end it went very well, I really think it's a good basis for other projects."⁶

The CM describes the good contractual basis of the project. The narrative and explanations behind the contract are important. However, more importantly, the use of the contract is for support and not the goal of fulfilling the contract itself.

"You have to think carefully about whether to say yes to a DBFM contract like that. If you say yes all the time, well, go to your contract manager and then it becomes more work. You know, so then you have to write a VTW. Without a VTW We're not allowed to do anything without a VTW. And those contract managers will take a look. Yes, what does the contract say? Some promises have been made by the contractor, for example, we said we wouldn't vibrate on the A16 where I was before. We said we wouldn't vibrate unless, well, in the end we have to vibrate, then you have to make sure that "unless" is clear, right? Is that right? What did you put in the contract? Can you prove it? Now, hm, hm, eh, and then that customer goes. Of course, he's going to ask, "You said no vibration, hm, hm, eh," and then he's allowed to ask, but about lots of other things, eh, for example, how much noise does that vibration make? Then he's not really allowed to say anything. What do you have, just legal standards?"⁶

The contract is sometimes unclear, according to the EM. Here, the law is used as a reference to the contract to determine what should be done. The standard is the joint procedures based on a uniform approach.

"[...] if we're going to mow the grass, it can go very far with that performance contract. And that's where the mowing takes place. They have to take a photo of a piece of grass. So they can show and track exactly where they been. Well, you know, there are maybe five requirements that he has to meet, [...]you still have to prove it. Yes, that was the normal way of doing things, and that's a lot of paperwork. That's a lot, while we think, yes, they know what they have to mow, and then there's a bit that maybe isn't done quite as well. But you know, does that matter? Well, that's a balance, of course. To what extent can you leave it there? The chap who knows what he has to mow and goes once a week. Just take a look at one of those area caretakers and he says, hey guys, fine,

⁶ Dataset Governance part Formal contractual

or take a photo and report for every bit. You mow on gras, just measure it. Yes, seriously, really. How else do you demonstrate that requirement? Yes, should I just put that here? Demonstrating requirements? Then that's yes, or UAVGC or performance contracts.”⁷

The CM describes how to fulfil a requirement and the urge to prove every requirement. Here, there is almost no trust, and the actions are taken to prove the contract requirements, which are lengthy amendments of procedures and proof.

“You don't see how things are functioning and you act on the basis of a beeping system. That's what I always call maintenance. Beeping systems, what do you mean? A beeping system is when people start beeping to indicate that something is going wrong.”⁷

The TM explains that the lowest level of maturity is a reactive way of thinking. Here, the bare minimum is done to comply with the contract.

⁷ Dataset Governance part Formal contractual

4.2.3 RRA

RRA			
	<i>Common goals & interest</i>	<i>Win-win philosophy</i>	<i>Transparency and avoidance of opportunism</i>
Optimized	Common interests and non-common interests have been jointly agreed upon with substantiation for understanding implementation possibilities.	Working with high efficiency towards common goals that benefit everyone, making concessions where necessary to make this possible.	Openness and transparency between all parties by actively informing each other and providing clarity to prevent opportunism.
Managed	Organisations have set a common overarching goals for greater understanding and trust.	Appropriate guidance so that every party benefits.	The involvement of senior management and organisations in teams and conflicts is monitored and resolved.
Standardized	The team works towards a common goal of serving the project.	Demand is met and attention is given to mutual benefit through concrete goals.	Unity within the team and addressing behaviour that is not in line with the team's values.
Known	Individuals contribute to the common good.	Demand is being met, and some parties are benefiting from this.	Individual transparency towards each other.
Initial	Individually aware of common interests but no connection or implementation in the team or organisation.	Unequal distribution of profits and focus on the parties' own interests.	A closed attitude with a lack of transparency.

Figure 16 RRA maturity matrix 3 of 4

Figure 16 shows the maturity matrix for RRA based upon the quotes. Overall, it shows that RRA in a relational contract concerns the risk in a relational contract. Higher maturity levels require more than just people and the project team. All parties involved must contribute to achieving a high maturity level. A shared goal with collective gains helps to counteract the incentive for opportunism, with transparency as a sign of trust. The lower the maturity level, the more individualistic and therefore opportunistic it becomes. Based on the combination of sub-component maturity levels, the component maturity levels can be defined. Per maturity level in the sub-components, the component level was defined, giving the following:

Relational contracting

Optimized	Goals that are based on common interests which based on transparency and are beneficial to all the parties to counter the opportunism.
Managed	The organisations have overarching goals which are guided and backed through involvement of senior management.
Standardized	The project teams have common goals which are mutual beneficial and are secured by team values.
Known	Individually contributing to the common good with some general benefit.
Initial	Interest is in the individual self and benefit is unequally distributed.

4.2.3.1 Common goals and interests

The general view of the interviewees shows that the lower maturity levels of common goals & interests are characterised by not willingness to implement or connect with the goals. As the maturity increases, the connection becomes stronger and implementations increase through joint effort.

“To take the interests into account right from the start of the assignment. [...] There is a limit somewhere, and here that limit is virtually non-existent. Look in each other kitchen and you will see each other’s advantages and disadvantages, and you can use that to come up with a strong solution right away.”⁸

The TM make the remark that interests need to be taken into account from the start. If every party is open and shows what they seek and can help with the solution fits better and becomes more assertive. By managing the problem like this, it fits with a managed maturity level.

“You discuss the risks and see what needs to be done. Yes, you could already reason that way, especially from the team’s perspective. [...] we’re quite close-knit. So that’s definitely a team, and I also have quite a lot of contact with the Kostenpoel, and then you see that you’re working together towards the same goal. Yes, and that’s what I think is so great about those relational contracts.”⁸

The MpC states that working together to achieve the same goal is great. The shared goal helps in aligning the problem identification and trusting each other as the project moves closer to the shared goal.

“The program, so everyone is aware of their wallet and manages it wisely.”⁸

The MpC mentions that working in the same program helps to spread awareness that everybody who takes part has the same goal. This helps as an individual determines the orientation of thinking.

The quotes didn’t show an optimal and an initial level. These are developed from the other levels. In RRA an optimised level would include a jointly agreed interest to help in implementation possibilities with a certain underpinning to build from. The initial level shows that there is a common goal, but with no implementation or connection in the project team or organisation.

4.2.3.2 Win-win philosophy

The general view of the interviewees shows that the unequal distribution of benefits belongs to the lower maturity levels and the equal benefits to the higher ones. The optimised level shows that concessions are made to make it work.

“[...]I’ll use the example of the open ei.[...] Yes, we’ve seen it. Eh, this is what’s going on. This is our analysis, and yes, this is how we want to solve it, and sometimes they said, ‘Hey, we have this going on. We’re working on the analysis, right? The solution is still to come, but that was always the process for us. We actually knew exactly. This is what’s going on. This is the analysis and this is how we’re going to solve it. [...] And yes, they were soberly honest about it. We just knew. We’re not perfect. [...] that works on trust, [...] when you have that trust, then you can still get angry about it sometimes, but you keep talking, and when people no longer have that trust, or when it’s damaged, then you don’t talk about what happened.[...] You always do this and that’s really a step from working together to making things personal, attacking the person. Yes, okay, well, that’s something that definitely doesn’t work.”⁹

⁸ Dataset Riskmanagement part Common goals and interests

⁹ Dataset Riskmanagement part Win-win philosophy

A MpC provided an example with the optimal maturity view. Here, all the involved parties were actively informed about how it went. The honesty, trust and self-reflection brought a goal-oriented scenario. The pitfall when it goes wrong is blaming and personalising the attack.

“Who will do which part of the project? We have decided that. Well, it was actually very well received. People also had something like this. Oh, it's also nice that I don't have to think about it myself and you already think I'm the best person for this position. I also said this morning that if that's not the case, well, we'll discuss it again together.”¹⁰

The PM tells about a decision made to bestow certain parts on project members. The team was pleased that deviating from the standard of jointly agreeing and managing took some pressure away. It provided clarity and solved the dilemma there can be deviation from the standard we created.

“[...]they're performance contracts, but that works the same way. [...] and then the VTW came along and some processes started. Then I can make the adjustments. Well, and that was it. [...] while normally you have to submit it first. A few weeks later, I get a response, another response tomorrow, and then we'll make the adjustments.[...] I think it's just a win-win, really an insight. [...]”¹⁰

The TM shows the different procedures of contract adjustments. The RT is shorter, resulting in a shorter time between submission and operationalisation. In this instance, it is less process time, leading to a quicker fix. This change is standardised to perform these regularly, which lets profit both parties.

“We are very good at executing, but the assignment always comes from the customer. Well, that's in this contract. Ask us a lot more to find out. Because if you have a very clear question, we can also make a good design.”¹⁰

The EM mentions that the design is beneficial to them. If there is clarity, they can be more specific and optimise it more from their perspective.

The quotes didn't show an initial level. These are developed from the other levels. The initial level would contain the focus on the party's own interest on top an unequal distribution. There is no win-win, but potentially a win-lose philosophy.

4.2.3.3 Transparency and avoidance of opportunism.

The general view of the interviewees shows that transparency and avoidance of opportunism are linked to multiple elements in a RT. Low maturity is described as a lack of transparency and a closed attitude, while higher levels of show behaviour that is more open through information sharing and transparency. Parallel to this trust seem to increase as well.

“[...] how does that kostenpoel ultimately make the decisions? No, they have to give their approval. [...] they indicate the points on which they disagree with the budget. If those are very serious issues, then we will have to go back to the contractors. You really have to do something about it, otherwise I can also say contract manager. Well, I've seen it, but the importance of the project. We're going ahead anyway. My consideration is usually, well, look, a one-off item is a very special piece of equipment that they can't agree on in terms of price. Well, then take a look at what's being introduced. It is indeed times three that they pay. Eh, fine, it doesn't set any precedents for future projects, because things like this probably won't happen again, but is there something that's going to happen a lot in the near future? And yes, coming to an agreement is important, because that's what matters. It's not a one-off thing. It's going to happen more often. Yes, and then I say yes, let's sit down again. Try to come to an agreement. [...] that does reflect on your openness.”¹¹

¹⁰ Dataset Riskmanagement part Win-win philosophy

¹¹ Dataset Riskmanagement part Transparency and avoidance of opportunism

The CM provided an example where finance played a role. There are disagreements in the budget and expenses in the project. By using a somewhat external party to validate the set budget and give pointers, the CM can ultimately decide whether to continue. Being open about what is needed and why shows transparency and openness. They inform each other what is needed.

"[...] , but sometimes it's good, in terms of support, to get people involved in the project. You can, of course, think solely in terms of the project and, [...] then make a choice and pass people by. But then, later on, you'll have problems with that, so sometimes, when it comes to the future and good cooperation, you have to focus on a few extra people, and that often doesn't benefit the speed."¹²

An EM states that passing people by does not benefit the speed. However, for the collaboration, it helps to inform and include everybody in a certain way. It needs to be carefully considered how to include everyone without sacrificing speed. By considering what it adds in transparency and avoidance of opportunism, a better balance can be struck.

"Well, ideally, you should discuss the risks together and assess them together. Also, recognise that it's not just the projects or process control team that identifies risks. [...]but everyone has a role to play. Everyone, not just one person who is designated for this[...] see what risks their work has and that they discuss them with, [...] I think that's maturity in risks."¹²

The Mpc explains the standard approach of identifying risk. The risks are discussed together for transparency, and as a team member, everybody should recognise their own role in mitigating this, although not designated to. Their team's behaviour should be in line with achieving the same goal.

"Yes, and then it starts to go well again, proving yourself again, another moment of control in between, so you actually say, 'Eh,' because you have blind faith and then you can actually destroy the trust you've built up, because you've built it up over time, of course. That's what you've definitely built up or proven. Yes, trust the same thing."¹²

The TM says that proving and building trust is hard and easily lost. It starts with proving yourself that individually you can be transparent and not be opportunistic.

"You mean, that you're talking about the opposite of a traditional relational contract. If you say, well, that's really immature. How you interact with each other in a partnership, or how you deal with, well, if you're only concerned with your own interests, then, you drift apart, so to speak, [...] Only your own interests. If you don't invest in people, so to speak"¹²

The EM expresses only its own interests as really immature. Not investing in people and only caring about their own interests.

¹² Dataset Riskmanagement part Transparency and avoidance of opportunism

4.2.4 Embedded social norms

Embedded social norms				
	Trust	Autonomy & equality	Loyalty and reciprocity	Integrity and honesty
Optimized	Throughout the organisation, people trust each other, which means that less control and documentation is needed for the individual implementation of projects.	The team works independently of the organisation in making decisions to take the best decision based on their requirements, equality and the project.	Each partner helps each other based on previous experiences in which solidarity and a shared perspective are the starting point.	A shared higher goal in which information is shared in order to work in a solution-oriented manner with all partners.
Managed	Trust between teams and organisations has developed sufficiently for them to interpret the project in their own way.	Autonomous and equal cooperation between organisations with overarching guidance and mandatory implementation.	Teams and organisations show solidarity with each other and represent each other's interests.	Achieving higher goals with measures to address deviations clearly defined and supported by partners.
Standardized	The team has built up enough confidence to be able to organise the process themselves. However, finances have not yet been released.	Equality within the team: able to set up and implement their own work processes and discuss them with the entire team.	The team stands up for each other's interests. The team is not yet seen as having any interests.	The team uses a transparent approach to weigh up the options for achieving the project's higher-level goal.
Initiated	Personal trust is present, but the project layout is not left to chance and the contract must be strictly adhered to.	Personally equal and playing field becoming more equal, but still dependent on other people in organisations.	Make an individual effort for personal interests to understand each other's point of view.	Personally open and honest with each other and ability to empathise with each other.
Almost unknown	The contract is leading and people start to trust each other.	Fully described and recorded with minimal possibility of deviation. OG/ON ratio not equivalent.	Ignoring each other's interests and focusing on personal gain with a non-existent sense of fairness and loyalty.	Individually focused and no openness and honesty towards each other

Figure 17 Embedded social norms maturity matrix 4 of 4

Figure 17 shows the maturity matrix of embedded social norms based upon the quotes. This matrix mainly represents the human interaction aspects in a relational contract. The expression of these norms is mainly through the contract, which means that low maturity results in few opportunities to manoeuvre within the contract. If the step is taken to set aside one's own priorities, more opportunities arise to build the relationship and thus also to seek opportunities within the contract. In the standardised stage, it can be seen that people are trying to improve together and establish social norms. The next step is to promote and maintain this. Based on the combination of sub-component maturity levels, the component maturity levels can be defined. Per maturity level in the sub-components, the component level was defined, giving the following:

Optimized	There is trust throughout the whole organisation where every partner can operate autonomously and act accordingly with the shared goals as their starting point.
Managed	There is an overarching guidance and goal with possibilities to deviate as the trust between team and organisation is developed through solidarity to one and another.
Standardized	The team organises the processes through equality and transparency serving the shared goal.
Known	The individuals in the team trust each other, are honest and make individually effort for the others interests.
Initial	There is a strong traditional relation and it is dictated by the contract which almost eliminates the useful social norms present in the contract.

4.2.4.1 Trust

The general view of the interviewees shows that trust is a conditional term for determining how to work together. When present, it showed a lower urge for control, when not the opposite in the form of a strict contract. Further, it was defined by honesty, transparency, the handling of money, and had to be built up/earned over time.

"[...] This is the analysis and this is how we're going to solve it. That's kind of standard procedure, what we do, from my perspective. Every time I picked it up with them. And yes, we were soberly honest about it. We just knew. We're not perfect. That doesn't matter, as long as we're aware of it and steer it in the right direction. [...] once you have that trust, then you can still get angry about it sometimes, but you keep talking, and once people no longer have that trust, or it's damaged, then, well, you don't talk about what happened anymore, [...]"¹³

A MpC states that by being open, transparent and in this case, consistent, trust can be built. Further, it is stated as a condition to keep talking about the problem and solve it eventually. This will limit the restraint by the urge of control from the other parties.

"Ultimately, it's also a tool for organising a team.[...] have to as a team[...] how do you call it? As a team, you have the assignments ready and not only your own part of the assignment. [...]"¹³

An EM explains that to organise and gain trust that everybody needs to look at the whole assignment. Every member needs to contribute to the assignment in a way that helps not just for their team but also to show their own implementation of the project.

"[...] Once we started talking about money, you could see the trust plummet and suddenly see the old behaviour come back. Just like what you had years ago with RAW things, where people really pointed the finger [...] Well, this is a device that is not widely available and therefore expensive, isn't it? All those other discussions were almost impossible to carry on. Because everything was going well in all areas. Except for finances through which politics could have saying as well."¹³

The MpC states that trust and finance have a strange connection. When talking about it, trust seems to fall and all the non-related items as well. Therefore, a project team is trusted to organise itself, but not financially.

"[...] and you should therefore be co-owners based on maximum trust, without thinking that the incentive of money will cause the subcontractor or my contractor to do things that you don't want him to do, but the client is making it so difficult for me with everything that's been written that I can't actually operate."¹³

The TM co-owners with maximum trust would be optimal, but in reality, the client is making it difficult to even operate. The contract narrows the options and shows no signs of trust and low integration.

The quotes didn't show an initial level. These are developed from the other levels. The initial level would indicate that the contract is leading and trust needs to be built because there is not any.

4.2.4.2 Autonomy and equality

The general view of the interviewees shows that the relationship of money between client and contractor is there, but depending on the maturity can vary in presence, with lower maturity being stronger and higher maturity being lower. As the maturity increases, the autonomy of a project increases, eventually they work independently and make decisions on what they see fit for the client.

¹³ Dataset Embedded social norms part Trust

"No, you could see that conflicts arising from day-to-day care were being removed. And you could see that people realised, 'Oh, if we start fighting, the losses will only get bigger.[...] Well, what we had as a mechanism there was that we took it out of the daily routine. Did we assign separate people to have those discussions? Yes, um, they actually took the discussion points or the points of friction. Did you just take them out of the flow, so that you could ensure that people just weren't confronted with them. Well, so that you could have the emotional part that goes with it. There is a very strong link between emotion and cooperation. And there is also a very strong link between trust and cooperation."¹⁴

A MpC shows the example of managing the project according to its needs by choosing a different way in conflict resolution. The choice to handle it differently is the freedom from complete autonomy. It further shows independent functioning and decision-making with good implementation in the organisational structure.

"Yes, so it's really I can't trust you if you're not open with me. And if you're not open with me, then there's no equality. Then you're hiding something from me. Okay, is there something you don't want to do or connect with me about or share? Yes, that this also reflects back on everything being connected. Okay, and you would say that everything is connected, but it either strengthens or weakens each other. And yes, strength or weakness balances each other out. [...] What do we have and what purpose does that serve so that we can build that together, but it does start from here. If someone doesn't feel equality and thinks, hey, but I'm the client. I'm above you, that's quite a long way to go."¹⁴

A PM mentions that there are certain conditions for equality and what the effect is. Equality is also important as it reflects everything that is connected in a certain way. Improving the relationship to get an equal playing field starts with a more mature approach.

"[...] It has to be just right, because if it's too low or too high, they won't be able to access it. [...] we going to do that in October, because then the water level will be just right. [...] it's not working out. We're going to start in November because our ships are stuck. [...] and be stuck for three days because the water is too low. It was all paid for. Hm, and I say, 'Wait a minute, we need to take a step back."¹⁴

The CM explains that in a situation where someone purposely decides to postpone the risk is also theirs. In this example, it was also paid for, but being equal in general means that one who decides takes a risk and everything goes well, the benefit. Due to being partners, they let each other take it if they think they can profit from it.

"Okay, so everyone knows what it should and may cost. [...] apples are compared with apples, because I've seen very often that unit prices are used or added on, and then you think, yes, that's all well and good, but it's not at all representative of what we ask of a contract partner. Just as an example, a hectare of mowing at Staatsbosbeheer is much cheaper than what we do, but with us, he first has to, take stock of whether, a piece of land belongs to us at all or is leased, how it's doing, and the condition we want it in. There are problems. There has to be an annual plan and so on, and at Staatsbosbeheer, a contractor with a beer belly is sent out. Go mow that. Yes, it's not comparing apples with apples, so we stick to my enormous process and that becomes a lot."¹⁴

The EM makes a remark about equality in the task description. The playing field differs due to all the processes surrounding the task. As the expectations are not the same for the same price, and it looks equal but is dependent on who makes the comparison in the organisation.

The quotes didn't show an initial level. These are developed from the other levels. The initial level would contain limited to no autonomy to deviate. The balance between the partners is not as it should be.

¹⁴ Dataset Embedded social norms part Autonomy and equality

4.2.4.3 Loyalty and reciprocity

The general view of the interviewees shows that ignorance and shifting the responsibility to another of low maturity. As more interest is shown and effort is made, the loyalty and reciprocity grow to a higher maturity level. This would show in the solidarity and shared perspective.

"It could also be different. I would prefer it if they just gave me the money. Well, that's really not going to happen anymore, interfering and saying, you understood exactly how to do that. So it's very much a matter of trust, you could say and you just have just one party that does the work and then gets paid for it. And another party that represents, the state, which pays the other party. You can never take that relationship away. You try to do it together, so, both represent each other's interests."¹⁵

A PM explains that loyalty and reciprocity can go a long way with good intentions. They show solidarity between them through representing each other's interests, but the relationship is still based on client client-contractor.

"By default, [...] Are you sitting here that you actually understand each other's interests more and that it's really optimal that you don't even have to think about it anymore? [...] you always have 100% the same line of thinking. [...] Because, yes, SMEs are always in it for the money. They have to make a profit and RWS wants a project to be carried out as well as possible."¹⁵

The MpC sees an optimal picture where, optimally, the same line of thinking would be beneficial. The standard, however, is that the involved parties want to make money, and RWS want a project to be carried out as well as possible. Although they value each other's interests, they are not one hundred per cent on the same page as a team.

"Yes, that in itself doesn't really make much difference to me. Yes, so it's really about representing someone else's interests. Okay, championing someone else's interests? Yes. So I really put a lot of energy into that, and when you're really doing that, you're at a high level of maturity."¹⁵

The PM notes that putting a lot of energy into others' interests gives you a high level of maturity. However, as a person, it does not really make a difference, as it looks more like a task. As this is on a more individual basis, the maturity is known.

"Measures, yes, but then they're simply ignored and people just think, "Oh well, it'll be fine." Yes, I don't think that's very mature. [...], that you just think someone else is responsible."¹⁵

A CM sees the lowest maturity level as ignorance and sees that someone else is responsible. There is no loyalty and reciprocity on this level.

The quotes didn't show an optimised level. These are developed from the other levels. The initial level would contain the same line of thinking with a shared perspective and partners that help each other based on the reciprocity of previous encounters.

4.2.4.4 Integrity and honesty

The general view of the interviewees shows that low maturity reflects an individually focussed with no honesty towards each other. The higher maturity shows a shared higher goal and a solution-oriented manner.

"Well, playing roles and the rest just doing everything in the hope that cross-pollination would take place so that the interests of the client and the contractor would intertwine, so that they would become owners together and manage the pot money together and look at the requirements together, [...] Yes, I don't know if we still identify interests here, but in an ideal world, you have the client and contractors together as one, and in a collaborative

¹⁵ Dataset Embedded social norms part Loyalty and reciprocity

form, he must also be there, and you should therefore be co-owners based on maximum trust, without thinking that the incentive of money will cause the subcontractor or my contractor to do things that you don't want him to do, or that I think, yes, but the client is making it so difficult for me with everything that's been written that I can't actually operate.”¹⁶

The TM speaks of an optimised view of co-ownership, maximum trust, and not to incentivise damaging behaviour. Everything is oriented to aid in the shared higher goal. By aiming for the higher goal, a high level of integrity would aid in offering a solution for the problem in not achieving this.

“[...] yes, but also the unnecessary ballast that you see in performance contracts. A lot of it is handed in verification and condition. What I mean is that sometimes it goes too far. I think, if you can rely on competent partners, you want to get rid of that. Twenty signatures somewhere before you get approval. That's what I mean more. With the unnecessary ballast, working according to the intention,[...] That's about twenty signatures before you can get started. [...] and that's meant to prevent unnecessary ballast, eh. Yes, but yes, working according to the intention. But before that happens, I want everyone to be aware of it and, um, that it's not oversimplified. The contractor would prefer, of course, to do nothing at all to prove that he should be paid, to exaggerate a little, and you say that the other party has a contract, but he needs something to be able to pay for such proof. Well, there's something there, of course. It has to be a good balance.”¹⁶

The CM explains in short how the contract came to be. From the perspective of integrity and honesty, the value is in intention and proof of payment. There has to be a good balance between those. As long as parties act in the interests of the shared higher goal and have proof of this, the client can be more relaxed with the contract and has a reason to reflect suitability of the standard measures.

“Yes, now we're set. I don't really want to let the people we have now go, so I'd rather do the maintenance now. Then we can scale back later, rather than the other way around, right? Yes, yes, those are discussions and you have to be able to have them with each other. [...]and then it has to be based on trust and on risks.”¹⁶

The MpC tells that over the years, the project team has built itself up. Now, there is a point in time when they are able to organise all the maintenance, and they are asked to scale back. The discussion is held with honesty and their problems of scaling back. As the standard is just implemented, there is a new problem identified.

“Allowing things to happen for the greater good before your own best interest. It may sound strange, but I think the ultimate is when you, when you no longer think in your own, in your own little box? Yes so that you actually identify completely with the project's interests?”¹⁶

The AM signals that, on a personal maturity level, people can allow things to happen for the greater good. As they open up and come out of their 'little box', so to speak.

“He had requested a service. He meant to say, make sure my grass doesn't get too long because I don't know much about being healthy, so not only was it poorly worded, it was also poorly understood, so the client and contractor didn't deliver exactly what I wanted, but I didn't ask for it properly either. Well, we did get something. As partners, we should have understood and perhaps tapped him on the shoulder and said, 'Hey, that's nice, 16 times.' But when do you want that? Have you thought about it? Wouldn't it be better to link it to a height measurement and say that it can be higher than 3 cm, so something like that? We would ask to clarify the intention and then amend the contract or improve my party's requirements.”¹⁶

The TM gave a real example of what happened and explained that not being honest will not help each other in the long run. By holding on to their own beliefs and not being honest to themselves, they failed.

¹⁶ Dataset Embedded social norms part Integrity and honesty

4.2.5 A culmination of results

The results yielded a maturity scale for each sub-component. These sub-components are used to construct the maturity matrix. Looking at the sub-components, it can be seen that the relationship and perspective from collaboration can often be traced back to other sub-components. Not using these does not detract from the content, as RPA, RRA, and embedded social norms also cover this. Using them would therefore only lead to duplication. This leaves 11 sub-components that do not overlap and can be used to build the matrix.

The sub-components Informal relational, formal relational, informal contractual and formal contractual form RPA. This component is framed within the administrative dimension of a project and forms a column in the matrix to represent this. The remaining seven need to be further divided.

Previously, RRA was conceptualised as common goals & interests, win-win philosophy and transparency+avoidance of opportunism. The first two mainly describe the distribution and integration of goals and interests between the partners in the project. Transparency + avoidance of opportunism is less relevant here because the quotes more often link it to trust from the embedded social norms. So these three sub-components do not form a homogeneous group under the component.

The embedded social norms included trust, autonomy+equality, loyalty+reciprocity, and integrity+honesty. Trust is a recurring theme and appears to play an important role. It was often expressed in terms of loyalty+reciprocity and integrity+honesty. Add transparency+avoidance or opportunism to this, and trust seems to be expressed in the aforementioned sub-components. Autonomy+equality remains and mainly describes the possibility of giving substance to interests and goals, which makes it more suited to common goals & interests and a win-win philosophy. These three together form the second column, with distribution and integration of goals as the common denominator. All the changes are visible in Figure 18

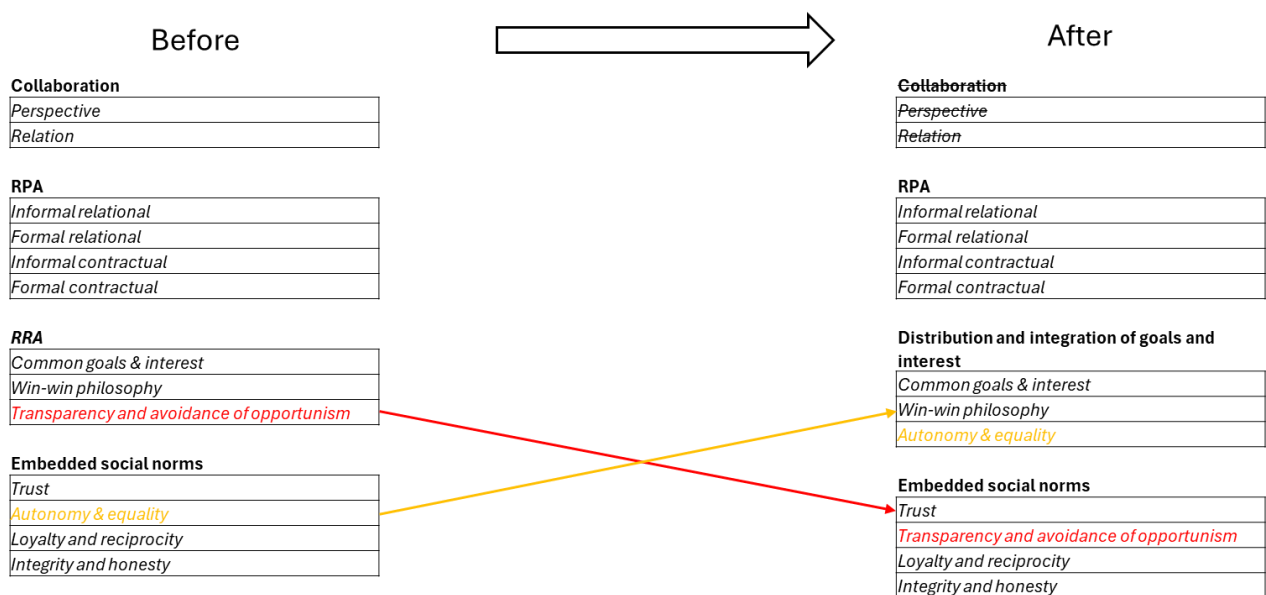


Figure 18 Visualisation of changes

At first glance, the framework from the literature is sufficient to make an initial distinction between the components. Relational project administration is primarily concerned with the management of the project. This remains the same as before, because the relational aspect is highlighted with the help of the subcomponents and the contractual aspect is placed in the appropriate context of a relational contract. In that sense, the explanation and separation are sound from the point of view of the contract.

Relational project administration looks at the management of the project in this division. Here, a relational and contractual division has been made. As maturity grows, the coordination between these two components will also improve. At low maturity, there is a lot of contractual control that goes through formal channels with little to no room for relational aspects. The demand for a relational contract requires maturity to grow towards a better balance between relational and contractual aspects, as it requires more relational aspects. In further division, the informal and formal aspects play a role. Informality plays a greater role in relational contracts than in transactional contracts. This is due to the lesser degree of formalisation required.

Relational Risk Allocation is specified and focused on the distribution and integration of goals and interests. By removing the sub-component transparency and avoidance of opportunism and adding autonomy & equality, the whole fits together better. It now provides the opportunity to express both the distribution and integration of goals in maturity. As a result, the interpretation links better to the relational contracting principles through the recognition of cooperation. Integration and representation are linked to maturity and will increase with growth.

The embedded social norms have changed with the addition of transparency and avoidance of opportunism and the removal of autonomy and equality. This reflects social norms that can be found in a relational contract. Zooming in further on the norms, it is noticeable that trust plays a more prominent role among them. Many of the people interviewed referred to this as one of the most important aspects of collaboration. In the interviews, trust was often mentioned and linked to another social norm. Specification allows maturity to be better expressed. As embedded social norms grow, integration in particular improves and the norms are more strongly represented in the organisation. This does not exclusively concern the norms discussed here, as there are many more, but these can be seen as examples that recur frequently and are recognisable.

The new insight is plotted in a matrix visible in Figure 19. Here three columns are presented representing relational project administration, Distribution and integration of goals and interest, and embedded social norms. The rows representing the maturity levels initial, known, standardized, managed, and optimized.

Relational contract			
	<i>Relational project administration</i>	<i>Distribution and integration of goals and interests</i>	<i>Embedded social norms</i>
Optimized			
Managed			
Standardized			
Known			
Initial			

Figure 19 New matrix frame

5 Discussion

The research problem comprehended a lack of a measurement tool to measure maturity in relational contracts of project teams. The research focused on designing a tool to measure the maturity of a project team using a relational contract.

5.1 Theoretical implications

The results of the design suggest that for relational contracting, more social components need to be added to a maturity model. As the literature review concluded, there is not enough overlap to cover the relational aspects through the selection of social components. As the components include collaboration and embedded social norms, it was found that in almost every interview, the interviewees mentioned collaboration as the first component in a relational contract. The maturity scale derived from the interviews signals that the higher maturity is viewed as shared and joint aspects for team success, while lower maturity is personal gain and distance-focused.

Further, trust played a large role in the interviews as a sub-component of embedded social norms. According to the interviewees, it is intertwined with other embedded social norms and has a relationship with opportunism in the form of a financial incentive. Therefore, seeing trust as a sub-component would not do it entirely justice, due to it being put on the same level as governance and culture according to Galvin et al. (2021).

Comparing the maturity scale to the research of Frydinger et al. (2021) it seems in general that the maturity goes from a traditional(transactional) contract to a relational contract and to a certain degree there are similarities. However the point of reference is different and focuses on other aspects to get a certain outcome. For example, the basis for managing the contract is with a traditional third party(Furmston & Tolhurst, 2010) and with relational each other(Blau, 1964). A PM mentioned in 4.2.4.3 that the client and contractor relationship is always there but never gone because. Showing that certain components will always be there, but the presence and focus differs in this case on social components. Thus, it cannot be stated that relational contracting is the opposite of traditional contracting. The data would suggest that relational contracting would be another kind of contracting.

In the literature review and subsequent proposal of the RT structure, two of the five categories were taken together to form collaboration as a component. An argument can be made that they had to be separate components. In the consideration to put them together, the focus on the relationship showed a lot of similarities with the other three components. If it were divided further into sub-components, there would be overlap with the other three, and that would make it obsolete. The perspective of the relation had the same with a strong connection to the embedded social norms through trust. Therefore, the choice was made to combine it. Collaboration was chosen to put the relation and perspective under as it covers the categories as a component, and there is a good academic literature basis as a starting point.

5.2 Measuring in practice

The model examines maturity in relational contracts within a project team. The maturity matrix described above uses relational project administration, distribution and integration of goals and interests, and embedded social norms to describe what maturity in a relational contract looks like. The matrix can be completed by collecting data on the behaviour of project members, the project organisation, and the norms and values of the project.

The data can be collected by conducting verbal interviews with the project members. With an IPM team, it is advisable to interview every role holder, preferably both the client and the contractor. If this is not possible for any reason, you can fall back on interviewing at least three people in the project team who hold organisational and contractual roles. For each component, the degree of maturity can be indicated and the reasons for this. To support this, the questions below can be asked to provide guidance.

Relational project administration

- How is the relation presented in the team?
- How is the decision-making connected to the behaviour in the team?
- How is the task carried out?
- How is the contract implemented in the project?

Distribution and integration of goals

- How are the goals and interests served and aligned between the affiliated parties in the project?
- How do the parties benefit from the project?
- How can the freedom to carry out the task as a project team be described?

Embedded social norms

- How is trust expressed in the project?
- How would you describe the transparency in the project?
- How is integrity expressed in the project?
- How can loyalty and reciprocity be described in the project?

By reflecting the answers in the matrix, the maturity levels for each project can be determined for each interviewee. No weighting is given in advance to determine which voice carries more weight on an individual basis.

After gathering the information, the matrix can be used to indicate where each interviewee thinks the level lies in order to look at the consistency of the scores. If there is an outlier above or below the norm, this may be a reason to seek clarification from the person concerned. Once everything is clear, this can be fed back to the team via a workshop. This workshop should include:

- What do the scores mean?
- Where do we recognise ourselves?
- Where does it align with our vision?
- What do we want to retain as a team?
- Where do we want to mature as a team?

The first and second questions focus on validating the result. The third question concerns the suitability of the team's vision. The fourth and fifth questions concern the vision for the future. By repeating the measurement, the data can show how maturity develops over time and how effective the management is in a relational contract within a project team. Furthermore, it can be linked to other measurements like project success, job satisfaction etc.

5.3 Limits

The frame derived from the literature is, to some extent, based on the work of Frydlinger et al. (2021). As mentioned in their work, it is a simplification. With a different interpretation, the component could have varied, and the frame would have changed. When more components would have presented themselves, the research would have been bigger in size and more complex. The content of the component showed some overlap, which can indicate that more would have been better. As the first research that designs a maturity frame for a project team that uses a RT there is no comparison available to check.

The substance of the framework is based on the interviews from a program with the three project teams. Program-wide, the ideas and structure were facilitated with freedom as a project team to make your own choices in how to give shape to the assignment. For many of the interviewees, this was the first time they came into contact with a RT. This could mean that their perception of a RT is what the program promoted. Additionally, most of them were used to more traditional contracts. This could mean that in their mind, this was what a relational contract could be. This makes the data generated from the interviews, in some way, a bit coloured. At the same time, it gives the interviewees a good opportunity to seek the difference between the contracts. They could highlight the differences in that regard, maybe better. This makes the data still valuable, but it would be interesting to see how another project team using a RT outside the program would see the maturity of the contract.

5.4 Recommendations

Based on the limitations and the findings, a first recommendation would be to further define the components. As mentioned, the research was based on a simplification to avoid overcomplication of the components. But by further defining through a more explanatory research in the form of a literature review and backed by a focus group of experts, the components can be thoroughly established.

The second recommendation comes from the selected pool of interviewees. All the people who have been interviewed are in the same program, and for many their first experience. Therefore, the same research approach as this research can be done with a different project team, but aimed to compare the design of this research and see where there are similarities and differences. The research approach would be an explanatory research by conducting interviews, following the same process of designing, and comparing the results.

The third recommendation is based on the development of RC. As the use of RC becomes more common, more development of these contracts takes place in all kinds of shapes. By collecting views through case studies, a trend can be seen in how the project team over time see and implements RC. A descriptive research would be suitable for this kind of research.

6 Conclusion

The research started with the definition of relational contracting which is formulated as follows: *'a two-part contract that seeks to describe the legal obligations and how the relationships will be governed between parties allowing stakeholders the power to govern themselves by using the contract as a mechanism towards flexible adjustment to change. A mini-society is created, which handles dispute resolution by avoiding litigation in the first instance and shares risks to a point where it creates stakeholders of the project.'* Combined with maturity levels inspired by MMGP Prado the frame was build. To define the maturity in the frame, interviews were conducted. These helped to determine the interpretation of the maturity levels and components from practice. The result of the interviews led to 11 components which can be differentiated in to three groups: Relational Project Administration, Distribution and integration of goals and interests, and Embedded social norms.

In the relational project administration, it can be noted that from initial to optimised, the relationship becomes central and the contract changes from leading and limiting to supporting and facilitating. The relationship also changes as maturity grows and formality decreases, but never becomes completely informal.

Distribution and integration of goals shows a development in the interpretation of interests by paying more attention to mutual benefit at a higher level of maturity, as opposed to a more individualistic approach. Alongside this development, there is also better alignment of goals and interests by coordinating them jointly with and among each other. Looking at integration, there is also greater freedom to make your own choices about how to achieve the goals in and with the project team. This goes hand in hand with equality through shared goals.

The embedded social norms are, as it were, a steering mechanism for the project. Trust seems to emerge as a kind of main category in the component. The other sub-components are therefore often associated with trust, but it is not clear which one is the leading factor. At low maturity levels, it can be seen that the contract resolves the lack of trust by taking the lead and laying everything down in writing. As maturity rises to a higher level, the contract becomes less necessary for trust, and there is even a reduction in documentation. Transparency, honesty and reciprocity also increase through the support of organisations and the representation of other people's interests.

This leads to a maturity model with a vertical axis representing the maturity of Optimized, managed, standardized, known, and initial and a horizontal axis of Relational project administration, Distribution and integration of goals and interests, and Embedded social norms as shown in Figure 20. As demonstrated in 5.2, to use the model, interviews or a survey needs to be conducted. The outcome can be used to plot the scores in the matrix. The outcome can be presented in a workshop format to communicate the results to the team and adjust the strategy accordingly to achieve the maturity vision based on the new insights.

Relational contract			
	RPA	Distribution and integration of goals	Embedded social norms
Optimized	The task is centralised by making joint considerations and recording these in such a way that the contract can provide an appropriate framework for demonstrating the desired behaviour.	The interests are jointly aligned to serve and benefit everyone equally. The team works independently and is free to interpret the project as they see fit, thanks to the confidence of the affiliated organisations that their interests are well secured.	Openness, transparency, honesty and solidarity are reflected in the roles and the team in the form of unity and equality. This results in a high level of trust and ensures a solution-oriented approach and a reduction in the need for control and documentation in the implementation of the project.
Managed	The relationship plays an important role by jointly deciding, integrating and reflecting on the desired behaviour. The contract requires coordination in order to fulfil the central task.	The interests are jointly aligned with an overarching goal so that each party benefits. The team works autonomously and equally within the organisation, based on the trust of the client, who provides overarching guidance with mandatory implementation.	Management and partners are involved in further representing the unity based on their roles and the team. Interests and conflicts are identified, monitored and resolved in a spirit of openness, transparency and honesty. This has fostered a level of trust that allows teams to interpret the higher goal in their own way.
Standardized	The informal relationship is beginning to play a more prominent role by promoting desirable behaviour in decision-making procedures and responsibilities based on a contract in which the task becomes more central.	A general objective for the project has been agreed upon and concrete goals have been set to focus attention on mutual benefits. Based on trust, there is freedom to create and discuss one's own work processes in order to organise and implement these within the team.	Within the team, everyone looks out for each other's interests in a transparent and honest way, with the team working as a unit towards the greater goal. There is enough trust to organise the process themselves, but not enough when it comes to finances.
Known	The relationship is formal and, on an individual basis, there is a degree of desired behaviour. The contract guides the project with prescriptive agreements and legal amendment procedures, which results in little flexibility and a one-sided interpretation of the assignment.	Individuals contribute to common goals in order to meet demand, allowing some parties to benefit from this. There is still an imbalance in terms of equality and dependence on people outside the project team in the various organisations.	On a personal level, there is a development in which people try to understand each other's interests. Transparency towards each other allows trust to develop, but the structure of the project is not left to chance.
Initial	The relationship is formal and businesslike, with agreements laid down contractually in the form of unilaterally restrictive, rigid agreements.	People are individually aware that there are common interests, but no action is taken on this and there is an unequal distribution of benefits due to a focus on personal gain. To manage this, virtually everything is prescribed and laid down without an equal client/contractor ratio.	One starts with a closed attitude that does not radiate transparency, openness and trust towards each other. In this case, the contract is leading and the focus is on one's own gain.

Figure 20 Relational contract maturity matrix

Looking at the research question “How to measure maturity in relational contracting of infrastructure project teams?”, it can be concluded that maturity can be measured by the use of relational project administration, distribution and integration of goals and interests and embedded social norms in a relational contract. Collaboration plays a major role in this, with elements of it incorporated into various components. This is therefore viewed and designed in different ways from a relational contract perspective.

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8 Appendix

8.1 Interview protocol relational contracting

Purpose of the interview: to determine how people who work with relational contracts define the essentials/pillars and shape the maturity steps in those essentials/pillars using the five given maturity steps. This will be used to create a maturity grid in relational contracts based on practical experience.

Preparation

- Whiteboard with markers.
- Business casual attire, but no collared shirt to avoid giving the impression that I am still a novice student. This will encourage greater willingness to share information.

During the interview

- Write quotes/comments on the whiteboard to sketch and highlight the interviewee's own image.
- Do not interrupt the conversation, and especially the interviewee's answers. After 3 seconds, people usually continue talking on their own because of the discomfort of the silence.
- Actively ask why people make certain choices. Focus on getting a good explanation for their reasoning.
- After an explanation or monologue, summarise and reflect back. This serves as a check to ensure the explanation is understood and as a starting point for further questions.
- Confirm intermittently with nods and words such as yes and okay.
- When writing on the board, write down exactly what people say in order to present a picture as accurate as possible.

Interview structure

Welcome and thank them for participating in the interview.

Inform the participant that the conversation will be recorded and that the data will be used, and ask for their consent.

Questions

Question 1

The first question chosen is to gauge the interviewee's knowledge of relational contracts. This provides perspective and a better understanding of the direction of reference for both data processing and interview reasoning. The following question is used to achieve this:

What do you know about relational contracts?

If the interviewee does not know what this entails, the following explanation is given.

Relational contracts are contracts in which the relationship is more central to the contract. It is therefore a collective term for contracts such as alliance, partnering, buildteams and two-phase approach contracts. The WOUW programme is also an example of this.

The next question is: *What is your experience with these contracts so far?*

Question 2

After creating the reference point and a concise summary of the experience, the intention is to use the whiteboard. The intention is to have a maturity grid on the board from the perspective of the interviewee. This can later be compared with all the other boards that have been sketched. First, it must be clear how people see the essentials of a relational contract as dimensions in the grid. This will be asked as follows:

If you were to name the essentials/pillars of a relational contract from your perspective, what would they be?

While answering the question, the essentials/pillars mentioned will be written down in a few words at the top of the board, side by side from left to right.

Question 3

Now that there is dimension to the grid, maturity thinking is introduced. With the following explanation: *For the next question, I would like to introduce you to maturity thinking. Here are different levels in which a certain degree of maturity occurs. Think of it as a child. In the beginning, you have to instruct in putting on clothes. That doesn't go well the first time and the shirt could well be backwards. The next step is that the child can already put on his clothes properly. After that, the next step would be for the child to be able to put on the clothes and do the laundry on their own without you asking. Now that the clothes have been put on of their own accord, the child only forgets to adjust the choice of clothing to the environment because shorts and a t-shirt with -2 is not the intention. After being able to do this, the last step is that the child is mature enough in letting and doing to choose the clothes themselves when purchasing them and to coordinate the outfit. Now it seems as if the degree of maturity is also equal to results. That cannot be assumed because, for example, when choosing clothes yourself, it may not be the combination you expect or see as successful, but it can be very mature. In many cases, there is correlation but not a direct relationship between high maturity and results. You have just defined a number of essences/pillars and I would like to challenge you to fill in the maturity steps here with the following five steps: Optimal, qualitatively mastered, standard, controlled and ad hoc*

The following question is asked:

How would you define the steps in the essences you just mentioned on the basis of adult thinking?

While defining the steps, it is important to know the reason behind the step. By asking who, what, why and how, more depth is given to this. In addition, a line is drawn under the written essences/pillars and the steps are written down on the left side with equal distance. Now it forms a grid where the steps can be registered.

The end

After filling in the grid (as far as possible), the following question is asked: *This is what your image of a relational contract looks like?*

This serves as a final check that what is on the board is correct. After this, the interviewee is thanked for participating and a photo is taken of the board. This serves as the visual representation of the interviewee's perspective. Later, it will be digitally processed in Excel.