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Master Thesis

Digitalisation of Dispute Resolution

A Study on the Influence of Culture on Digital Dispute Resolution Practices in Small-Scale Construction Projects in England and the Netherlands.

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Preface

This thesis contains the research I conducted for completing the MSc programme Construction Management and Engineering at the Delft University of Technology. The research is part of the Master's track Projects & People, focussing on the successful implementation of digitalisation to effectively improve dispute resolution practices in small-scale construction projects.

There are several people I would like to express my gratitude to. First of all, my graduation mentors Leon Hombergen, Hans Ramler, and Paul Chan. Thank you for your support and helpful guidance during this research period. Secondly, I would like to thank my Turner & Townsend supervisors Monne van Egmond and Jia Wei Ho. You have been most helpful assisting me in my research. Also, I would like to thank the colleagues of the Turner & Townsend office for your great support and willingness to help wherever possible. Of course I also want to express my gratitude towards the interviewees and panellists. Your input has been a fundamental aspect of this research. Finally, I thank my friends and family for their support during this research period.

Dear reader, I hope you will enjoy reading this thesis and gain some new knowledge.

Hannah Kapper

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Abstract

In recent years, there has been a growing interest in the potential of digitalisation to enhance dispute resolution practices in construction projects. Research highlights that the social aspect is an important element in both the successful implementation of dispute resolution methods and the adoption of digital technologies in the construction industry. Culture has the ability to influence this social dimension, shaping behaviours and practices. However, insufficient research has examined the extent to which culture influences the successful implementation of digital technologies in dispute resolution. While most of the existing literature focuses on dispute resolution and digital tools in the context of mega projects, small-scale projects constitute a vital part of the construction industry. Currently, there is a gap in knowledge on how culture influences the successful implementation of digitalisation of dispute resolution in small-scale projects.

The research question that links to this problem is formulated as follows: 'How can culture shape digital dispute resolution practices?'

This thesis discusses an extensive literature review on the concepts of culture and digital dispute resolution, and presents the results of a case study comparing perceptions about digitalised dispute resolution practices in an English and Dutch office fit-out project. Stakeholders within the projects were interviewed for this study, followed by a qualitative content analysis of the interview transcripts to identify cultural issues shaping digital dispute resolution practices. External validation of the analysis took place through an expert panel review. The findings show that culture affects the extend to which digital technologies can be used in dispute resolution and that the cultural position of a project team should be determined to ensure successful implementation of digitalisation to effectively improve dispute resolution practices.

Key words: dispute resolution, digitalisation, small-scale construction projects.

Glossary

Term	Definition	Source
Culture	'What is carried out, how and when it is done, who is involved and why things are done the way they are.'	Ankrah and Proverbs (2004, p. 554)
Dispute	Conflicts that require third party intervention to resolve in order for the project to proceed.	Own definition
Dispute resolution	The process of resolving a dispute.	Own definition
Effective dispute resolution	Dispute resolution that is successful in achieving the desired objectives and maintaining good relationships.	Own definition
Small-scale construction project	Building projects that include limited cost, low complexity, short duration, limited inputs, harbouring uncertainty, utilising limited formal documentation, considerable diversity in basic characteristics, and occurring in active environments.	Griffith and Headley (1995)

Contents

List of Figures

List of Tables

Executive summary

1. Introduction

It is generally known that construction projects tend to go over budget and undergo delays. This often lead to disputes between contractors and clients, especially around the causes of delays and their impact on the critical path of the project schedule (Jacobs & Meesters, 2022). Dispute resolutions aim to resolve the disputes arising in construction projects, but the process can take a long time resulting in budget exceedances, schedule overruns and even damaging of relationships (Assah-Kissiedu et al., 2010). These issues have initiated a common interest to understand the nature of dispute causes in order to formulate measures to prevent or minimise their occurrence or to resolve them quickly, efficiently and cost-effectively (Assah-Kissiedu et al., 2010; Farooqui et al., 2014).

In recent years, a surge of interest in the potential of digitalisation to enhance the resolution of disputes has been observed in the literature. Various studies have proven the ability of digital technologies to improve business processes (Bumann & Peter, 2019; Giacalone & Sajedeh Salehi, 2022; Unruh & Kiron, 2017). Liu et al. (2023) state that digitalisation of construction projects is urgently required in construction organisations to align digital technology and organisational conditions. However, insufficient research has been conducted on how digital tools for dispute resolution should be shaped to be in accordance with effective use in practice. Marathe et al. (2017) and Liu et al. (2023) emphasise the importance of the human factor in the successful implementation of new developments in practice. Hofstede (2001) describes how cultures significantly shape individuals' preferences and values, which manifest in the form of practices and behaviour. As culture has the ability to shape practices and behaviour, it can influence the successful implementation of digitalisation of dispute resolution in the building industry (Ankrah & Proverbs, 2004; Hall, 1999).

Most literature on dispute resolution is focused on mega projects. However, small building works are an established vital part of the construction industry accounting for the largest proportion of works within the industry and the majority of the industry's revenues (Griffith & Headley, 1995; McKinsey & Company, 2020).

Currently, there is a gap in knowledge on how culture influences the successful implementation of digitalisation of dispute resolution in small-scale projects. To close this gap, the main research question is formulated as follows: *'How can culture shape digital dispute resolution practices?'* Four sub-questions have been formulated to answer this question:

1. What does culture in the building industry entail?
2. What are decisive factors for disputes to occur?
3. What are the most important factors influencing the successful implementation of digital technologies in dispute resolution?
4. What are the most important elements of effective dispute resolution and what aspects of culture influence it?

The aim of this study is to identify how culture can shape digital dispute resolution practices in order to develop an effective advice to improve the resolution process in small-scale construction projects.

2. Research design

The research method that was applied consists of a literature review and empirical research. To capture how cultures affects practices, a case study is conducted, which compares two projects, one from England and one from the Netherlands, with the objective of providing a clear visualisation of the influences of different cultures on dispute resolution practices. The literature review discusses the topic of culture and the relevant variables of digital dispute resolution. After that, the two cases were analysed.

In each of these cases, the institutional cultural context and scope were assessed. Different stakeholders of both cases were interviewed to capture their interests. In the in-case analyses this data was used to identify how it influences the practical use of digitalisation of dispute resolution in small-scale construction projects. In the cross-case analysis, differences between both cases are revealed. External validation of the findings has taken place through an expert panel review consisting of three Turner & Townsend employees with working experience in both countries.

Table 1 shows the criteria that were used to select the cases, following the 'most similar systems' design.

Table 1: *Case criteria per selected case.*

Criterion	**Case A**	**Case B**
The projects need to be executed in the same industry.	Commercial real estate	Commercial real estate
The projects need to be comparable in terms of project type.	Office relocation and Cat B fit-out	Office relocation and Cat B fit-out
The projects need to be comparable in terms of project size.	2,350 sqm	4,890 sqm
The projects need to be comparable in terms of monetary value.	EUR 4.1 million	EUR 6.9 million
The projects need to be comparable in the last four years.	2024	2023
The projects need to follow similar procurement routes.	Traditional	Traditional
Country of execution.	The Netherlands	England

3. Literature review

Two main concepts were researched through literature: culture and digital dispute resolution.

Culture

There are many different understandings and approaches of the concept of culture. The definition of culture followed in this study is formulated by Ankrah and Proverbs (2004), and describe that culture in the building industry is 'what is carried out, how and when it is done, who is involved and why things are done the way they are.' Culture can be assessed from different perspectives, studied on different levels, and classified in different ways. This study has used three main frameworks concerned with the classification of cultures to explain the concept of culture: the cultural levels, the cultural layers, and the cultural dimensions theory.

Literature describes how culture is viewed as a hierarchical construct, consisting of various levels nested within each other, from the most macro-level to the most micro-level. This study focuses on the three cultural levels: national, organisational, and role-specific, based on the studies of Erez and Gati (2004) and Karahanna et al. (2005). Each of these cultural levels consists of multiple cultural layers.

The cultural layers explain how culture manifests at varying depths. The institutional theory by Scott (2014) explains how institutions - cultural levels - are made up of three basic building blocks: the regulative

pillar, the normative pillar, and the cultural-cognitive pillar. The regulative pillar refers to formal rules, laws and enforcement mechanisms that guide behaviour through rewards and sanctions. The normative pillar consists of social norms, values and expectations that shape what is considered appropriate behaviour. The cultural-cognitive pillar reflects shared beliefs, mental models and taken-for-granted understandings that influence how individuals perceive and interpret their environment. Each of the pillars vary in the degree to which the cultural phenomenon is visible to the observer and is used to represent the cultural layers of the cultural layer model.

The cultural dimensions theory developed by Hofstede (2011) is used to understand the behaviour within organisations and national contexts and consists of six dimensions:

- **Power distance:** refers to how individuals relate to those of higher or lower rank and the extent to which less powerful members of a society, organisation or institution accept an unequal distribution of power.
- **Individualism versus collectivism:** describes the strength of the integration of individuals into primary groups. This can be either strong (collectivistic) or loose (individualistic).
- **Femininity versus masculinity:** examines the division of emotional roles between women and men and the values they hold. Modesty and cooperation are associated with femininity, assertiveness and competitiveness with masculinity.
- **Uncertainty avoidance:** concerns the level of stress in a society when faced with unstructured, novel or unpredictable situations.
- **Long-term versus short-term orientation:** reflects how societies approach time and change, focusing either on the future or on the present and past.
- **Indulgence versus restraint:** assesses the extent to which societies allow basic human needs to be freely satisfied. This can be either strong (indulgent) or weak (restrained).

To further explore the influence of the national culture, the legal systems of both England and the Netherlands have been assessed. Both systems provide a structured legal framework to guide contractual behaviour and manage relationships in construction projects. However, the Dutch civil law system allows for a contextual understanding of contracts in the construction industry, considering the parties' intentions alongside the text and emphasising principles such as reasonableness and fairness. English common law, on the other hand, is precedent-based and comprehensive, focusing on the precise text of written contracts and the binding standards they create.

Digital dispute resolution

The literature makes a distinction between conflicts, claims and disputes. In this study, disputes are defined as conflicts that require third party intervention to resolve in order for the project to proceed. Three main frameworks have been used to explain digital dispute resolution, developed by Cheung and Pang (2013), Marathe et al. (2017), and Liu et al. (2023).

Cheung and Pang (2013) developed a model consisting of 46 basic events that lead to construction disputes, either categorised as contractual or speculative, when occurring in a certain combination. They identified contract incompleteness as the root cause for construction disputes as it underpins both categories of disputes.

Once disputes have occurred, methods are needed to resolve them in order for the project to proceed. Several formal dispute resolution methods have been developed over time, with litigation being the most traditional one. However, litigation is expensive and time-consuming, and is experienced as significantly hostile. For that reason, alternative dispute resolution (ADR) methods have been developed, such as arbitration, adjudication, mediation and negotiation. However, Marathe et al. (2017) emphasise the practical ineffectiveness of these models and state that stakeholder preferences and interests are critical to the successful implementation of dispute resolution methods, rather than any formally stipulated methods.

The last framework used in this study to explain digital dispute resolution practices is developed by Liu et al. (2023). The paper describes how existing research on digitalisation of construction projects has mainly

been limited to the technical aspect, resulting in many different usable technologies, but lacking research on the role of the social aspect. Liu et al. (2023) emphasise that this is a key reason why the construction industry has underperformed in the digital transformation process.

The conceptual model, as shown in figure 1 below, shows how the theories have been combined to form the basis for the empirical research.

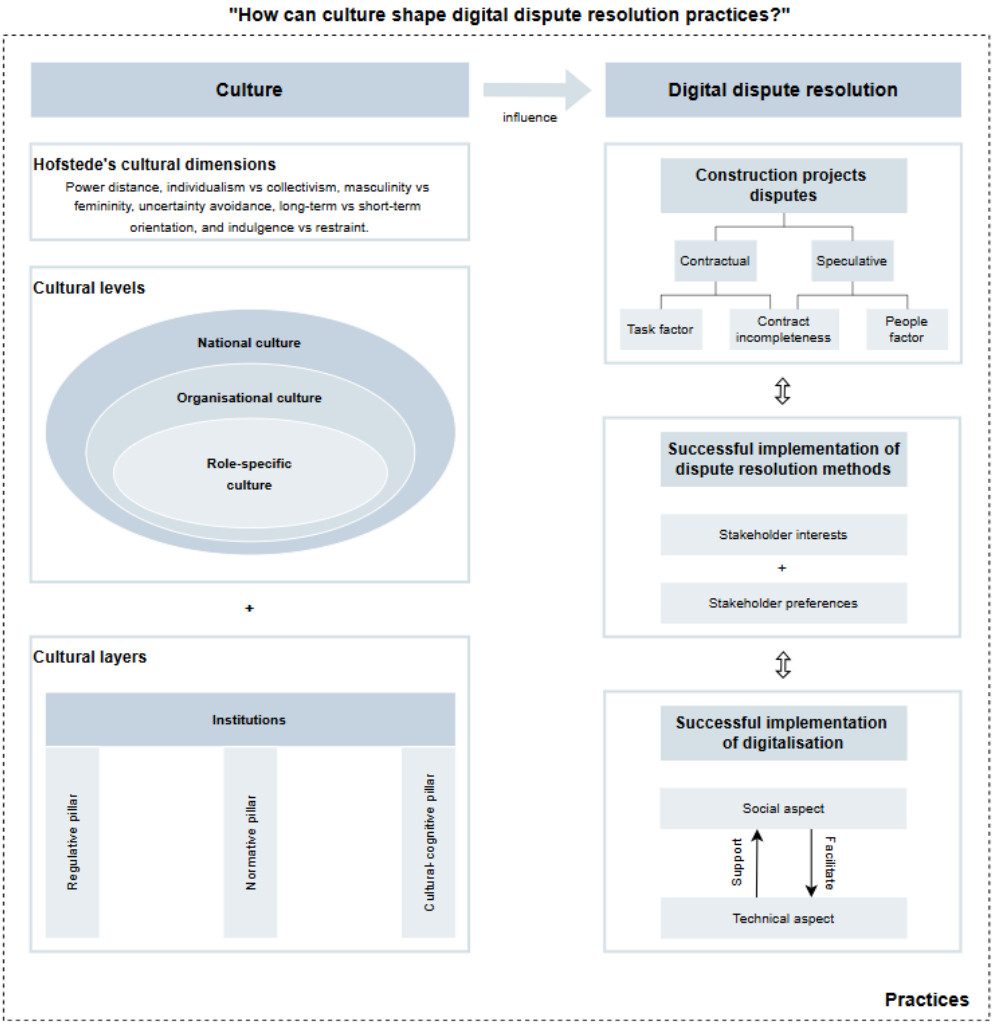

Figure 1: *The conceptual framework.*

4. Findings

General findings

The empirical research revealed that identifying the root cause of a dispute is not necessarily the most important step in its resolution. While the analysis of the root cause, as applied by Cheung and Pang (2013), can identify and correct clear failures, disputes in construction projects are typically the result of an accumulation of basic events and, more importantly, how these events are handled. The interviews showed that initial friction often arises between the client and the contractor when a client wants to make changes but does not realise the impact it has on the contractor's duties, since they lack technical knowledge. Beyond the factual circumstances, the interests, emotions, and preferences of stakeholders have a significant impact

on both the approach and the outcome of dispute resolution.

The research showed that negotiation is the predominant method of dispute resolution in small construction projects. The project manager has a very significant role in the decision-making regarding appropriate solutions, as they are positioned between the client and the contractor, which are the parties that are most commonly in dispute. Other formal methods are rarely used due to their associated costs. Stakeholders from both case studies indicated that dispute resolution is seen as effective when the project remains on budget and on schedule, while maintaining good relationships. The preference for negotiation stems from its perceived ability to maintain these relationships, consistent with the literature that ADR methods were initially developed to reduce costs and adversarial processes.

Similarly, the study found that in both cases, the only digital technologies currently used in dispute resolution for small projects are email correspondence and Teams. Email communication provides an automatic digital audit trail, while Teams facilitates remote project meetings. Although these tools are generally considered effective, some stakeholders noted that retrieving relevant information can be time-consuming, suggesting a need for improved digital organisation. Despite this, the uptake of other - more extensive - digital tools is limited, mainly due to cost concerns and a lack of perceived benefits.

Though both cases showed that a digital audit trail is the only digitalised aspect currently used, and that negotiation is the predominant method for resolving disputes in small-scale projects, the empirical research highlighted various cultural differences in how these processes are conducted. A key observation from the case studies was that the role of national culture and the regulative pillar is highly significant in shaping dispute resolution practices. Differences between the Dutch and English legal systems influence how disputes are approached. The Dutch case study reflected a preference for initial joint discussions before referring to contractual agreements, reflecting the general culture of trust between parties that exists in the Dutch building industry. Whereas in the English case, the contract served as the primary point of reference. These differences are in line with national cultural characteristics, where the Netherlands, classified as 'feminine' in Hofstede's cultural dimensions, values reasonableness, fairness and compromise, whereas the UK, with a 'masculine' culture, places greater emphasis on structured legal frameworks and contractual clarity.

The interviewees expressed resistance to the complete digitalisation of the dispute resolution process, emphasising that human interaction is essential to achieve a fair and suitable solution. It was repeatedly mentioned that dispute resolution is not only about factual events, but also about reasonability. However, the extend to which emotions and facts are used different between the cases, which were in line with the feminine and masculine character of both countries. In addition, the the Netherlands has a strong uncertainty avoidance, whereby resistance can be experienced towards innovation, whereas the UK has a low uncertainty avoidance and focuses on innovation.

The combination of placements on these two cultural dimensions seems to reinforce each other in the effective implementation of the digitalisation of dispute resolution in practice. In case A, it was noted that, an important cause of disputes is the stress experienced by stakeholders caused by time pressure, which affects decision making and stakeholder behaviour. For this case, it was found that a digital system would not be able to take these emotions and underlying thought processes into account. The Dutch building industry values the way situations are interpreted and the underlying thoughts. This means that emotions also play a significant role in the industry, rather than pure facts. This reinforces the importance of human involvement in dispute resolution and the resistance to digital technologies to replace it. In case B, however, the empirical research showed that facts are of greater significance than emotions, reflecting the contractually oriented building industry in England. In this case it was noted that an internal digital portal has been developed by Turner & Townsend to track changes within a project, but that the the data input could be more efficient. This reinforces the UK's masculine, result-driven character. However, the use of an external digital tool to increase the efficiency of the data input is not possible, as it would breach the company's confidentiality regulations, setting restraints on the use of similar technologies.

Validation

Three statements were formulated based on the findings. These statements have been validated in by three Turner & Townsend experts in the building industry, with both working experience in England and the Netherlands. The statements were as follows:

I. If the project management organisation promotes the use of digital technologies, client and contractor organisations are more likely to be open to using those technologies.

II. If trust in a digital system to make a fair and reasonable assessment is enhanced, it can replace the human connection is dispute resolution practices.

III. An effective design feature for digital dispute resolution is when technical information is kept between the contractor and the architect, and the project manager only informs the client of this information.

For statement I, the most important note was that the experts did not think that it would be effective if a project management organisation would invest in digital technologies to prevent disputes in small-scale projects. This was mainly due to the costs and time it takes to train and learn the contracting authorities to understand the benefits of using the technology. A second important thing noted was the large amount of different product available, and the fact that organisations may use the same product differently. Regarding digital technologies for dispute resolution, the experts agreed that a digital audit trail is beneficial to substantiate discussions.

On statement II the experts unanimously agreed that the human connection in dispute resolution can never fully be replaced by a digital system. The main reasons given were the human elements that are involved in disputes, which are deemed impossible to quantify by a digital system. However, the experts noted that a digital system could be valuable to go through documents and information to give an initial assessment for a dispute solution.

Statement III was not found to be valid. While clients may not fully understand technical information, completely excluding them from it is not beneficial.

5. Discussion

Overall, the theories discussed in the literature review provided a solid basis for the empirical research. The findings of the empirical research related to the frameworks by Erez and Gati (2004) and Karahanna et al. (2005) (cultural levels), Scott (2014) (cultural layers), Marathe et al. (2017) (successful implementation dispute resolution methods), and Liu et al. (2023) (successful implementation digitalisation) were in line with the literature. However, the cultural dimensions theory by Hofstede (2011) did not prove to be fully useable in explaining the influence of culture on digital dispute resolution practices. From the six cultural dimensions, only two were found to have a connection with these practices: feminity versus masculinity and uncertainty avoidance. The Netherlands is described as a feminine culture, resolving conflicts through negotiation and consensus, while the UK is masculine, prioritising decisiveness and results. This cultural difference is reflected in how emotions and contracts are considered in resolving disputes. The position of culture on the uncertainty avoidance dimension was found to contradict to the structure of the country's legal system, but reinforces the observations made on attitudes towards digitalisation of dispute resolution. The other four dimensions - power distance, individualistic versus collectivistic, short-term versus long-term orientation, and indulgence versus restraint - did not show to have an influence on determining digital dispute resolution practices in this research.

The model of Cheung and Pang (2013) was used to identify the causes of construction disputes in order to determine an appropriate resolution method. However, the empirical research revealed that identifying the basic event of a dispute is not necessarily needed to determine an effective resolution method. In addition, Cheung and Pang (2013) identified contract incompleteness as the root cause for construction disputes, as it underpins both contractual and speculative disputes. The empirical research showed that contract incompleteness does lead to conflicts, but not necessarily disputes. An accumulation of basic events,

combined with the human factor - including emotions that are strategically employed, the effort invested in a project, the use of human terms in contract documents, interpretations, and handling - is the most important aspect of conflict evolving into disputes. The role of the human factor did not have the same impact in the cases studied and was generally observed to play a more significant role in the Dutch project than in the English case.

6. Limitations

A number of limitations apply to this research. The first limitation is that a limited number of stakeholders has been interviewed for case B. It proved difficult to establish contact with the client, contractor, and architect of this project. In addition, it was not possible to interview the project manager of this project. By not interviewing these stakeholders, comparisons of cultural differences and similarities could not be made, affecting the transferability of the study's findings.

The second limitation is that many of the interviewees had no previous experience with digital technologies in dispute resolution, thus unable to share first-hand experiences of differences in the process with or without these technologies. This made it more difficult to identify the beneficial features of such systems and to determine which elements might be unnecessary, affecting the validity of the study's conclusions.

Thirdly, discussions in case B remained general and focused on potential disputes that could arise in a project. The more detailed issues described do not match the definition of disputes given in this research, which affects the transferability of the study's findings.

The fourth limitation is related to the validation, which took place in two separate meetings, rather than one single meeting. This meant that the experts were unable to discuss the results with all three together, affecting the generalisability of the validation results.

Lastly, the limited number of cases involved in this research, and therefore limited amount of data, means that the outcomes of this study cannot automatically be applied to other cases.

7. Conclusion

The main research question of this study aims to develop an effective advice to improve the resolution process in small-scale construction projects. Culture can shape digital dispute resolution practices in the following ways:

1. A country's legal system
A county's legal system affects successful implementation of digitalisation of dispute resolution practices. People in a consensus-based legal system show feminine behaviour and resistance towards digitalisation in the lower cultural levels. A digital system would be limited to assess documents to verify whether certain parameters have led to a delay. This can speed up the evaluation process and increase transparency, while still allowing human interaction to determine how the information is used. In a contractually oriented legal system, individuals show masculine, result-driven behaviour and are more accepting toward digital technologies in dispute resolution. Digitalisation can be applied on a larger scale than in a consensus-based system, as it can also be used to make an initial judgement on the allocation of responsibilities and to calculate costs by determining the impact of prolongation.

2. Resistance of organisations
Organisations generally won't invest in digital technologies in small-scale projects due to the costs and time it takes to train and learn the contracting authorities within a project team to understand the benefits of using the technology. Also, the amount of different products that can be used, and the fact that organisations may use the same product differently, reduce the likeliness of organisations to invest in digital technologies to prevent disputes in small-scale projects. As project managers are often the ones assessing different

solutions and responsible for the decision-making in small projects, their organisations should invest in digital technologies to resolve disputes. This way, only the project management organisation will have to be trained to understand how to use the technology and a homogeneous use of the technology is facilitated.

3. Regulations within the company
Regulations within a company affect the scope of the abilities of certain digital technologies and thus restrain the use of those technologies. Organisations should invest in developing an internal digital system to ensure it complies with the company's regulations. This way, the system can have access to all relevant information needed for dispute resolution.

8. Recommendations

The recommendations of this research have been divided in recommendations for practice and further research.

Recommendations for practice

1. Assess the cultural position of the project team
Let the project manager assess the project team's cultural position, particularly on the cultural dimensions of femininity versus masculinity and uncertainty avoidance. These dimensions explain the project team's consensus-based or result-driven focus and the attitude towards technical innovation in dispute resolution. This way, the project manager can familiarise with the characteristics of such composed project teams and learn how to deal with them, letting the dispute resolution process run more smoothly over time and reinforcing the elements of effective dispute resolution.

2. Invest in a digital system to support dispute resolution, not prevention
Project management organisations should invest in digital technologies to support the resolution process, rather than to prevent disputes. This way, only this organisation will have to be trained to understand how to use the technology and a homogeneous use of the technology is facilitated. In addition, since the technology is developed within the project management organisation, the technology will automatically comply to the company's regulations, ensuring access to all relevant information needed for resolving disputes.

3. Combine culture with the development of the digital technology
The abilities of a digital system are dependent on the project team's culture. Therefore, the abilities of the technical system have to be aligned with the cultural preferences of the project team. This will ensure the successful implementation of digitalisation to improve the dispute resolution process.

Recommendations for further research

1. Include a wider variety of participants to gain better insight in the stakeholders' interests and the differences in those interests across the projects.
2. Compare traditional and integrated contracts provides a more holistic understanding of how the regulative culture can shape digital dispute resolution practices.
3. Include other countries to expand the knowledge on the impact of legal systems on digital dispute resolution practices.
4. Focus more on the definition of disputes to ensure clear understanding of dispute resolution in small-scale projects.
5. Develop digital technologies as proposed in this study to test the practical effectiveness and subsequent developments are initiated.

9. Reflection

Although culture is not always at the forefront, it is an important factor in changes within the building industry. It is reflected in the behaviour and mindset of people within the industry and needs to be actively addressed and explored to ensure effective change within the sector. This research highlights that theory and practice do not always align. People in the industry like to see concrete ideas and actions to make concepts tangible. The recommendations made in this study provide a good basis for putting the findings into practice, giving practitioners insight into how digital technology can be used effectively in dispute resolution practices to improve the resolution process.

However, due to the limited number of participants in this research, the findings and conclusions are not automatically applicable to the construction industry as a whole. They are the first findings in this context and provide academics with new insights into the relationship between culture and project processes and stimulate further research.

Samenvatting

1. Introductie

Het is algemeen bekend dat bouwprojecten vaak over het budget gaan en vertraging oplopen. Dit leidt vaak tot geschillen tussen aannemers en opdrachtgevers, vooral over de oorzaken van vertragingen en de impact ervan op het kritieke pad van de projectplanning (Jacobs & Meesters, 2022). Geschillenbeslechting is erop gericht om de geschillen die ontstaan in bouwprojecten op te lossen, maar het proces kan veel tijd in beslag nemen, wat resulteert in budgetoverschrijdingen, planningsvertragingen en zelfs beschadiging van relaties (Assah-Kissiedu et al., 2010). Deze problemen hebben geleid tot een brede interesse in het begrijpen van de oorzaken van geschillen, om maatregelen te formuleren die hun optreden kunnen voorkomen of minimaliseren, of om ze snel, efficiënt en kosteneffectief op te lossen (Assah-Kissiedu et al., 2010; Farooqui et al., 2014).

In de afgelopen jaren is er in de literatuur een toename van interesse waargenomen in de mogelijkheden van digitalisering om de beslechting van geschillen te verbeteren. Verschillende studies hebben aangetoond dat digitale technologieën bedrijfsprocessen kunnen verbeteren (Bumann & Peter, 2019; Giacalone & Sajedeh Salehi, 2022; Unruh & Kiron, 2017). Liu et al. (2023) stellen dat digitalisering van bouwprojecten dringend nodig is binnen bouworganisaties om digitale technologie en organisatorische voorwaarden op elkaar af te stemmen. Er is echter onvoldoende onderzoek gedaan naar hoe digitale tools voor geschillenbeslechting moeten worden vormgegeven om effectief in de praktijk te worden gebruikt. Marathe et al. (2017) en Liu et al. (2023) benadrukken het belang van de menselijke factor bij de succesvolle implementatie van nieuwe ontwikkelingen in de praktijk. Hofstede (2001) beschrijft hoe culturen de voorkeuren en waarden van individuen aanzienlijk beïnvloeden, wat zich uit in de vorm van praktijken en gedrag. Aangezien cultuur praktijken en gedrag kan vormen, kan het ook invloed hebben op de succesvolle implementatie van digitalisering van geschillenbeslechting in de bouwsector (Ankrah & Proverbs, 2004; Hall, 1999).

De meeste literatuur over geschillenbeslechting richt zich op megaprojecten. Kleine bouwwerken vormen echter een essentieel onderdeel van de bouwsector en zijn verantwoordelijk voor het grootste aandeel van de werkzaamheden binnen de sector en het merendeel van de omzet (Griffith & Headley, 1995; McKinsey & Company, 2020).

Momenteel is er een gebrek aan kennis over hoe cultuur de succesvolle implementatie van digitalisering van geschillenbeslechting in kleinschalige projecten beïnvloedt. Om deze kloof te dichten, is de hoofdonderzoeksvraag als volgt geformuleerd: *'Hoe kan cultuur digitale geschillenbeslechtingspraktijken vormgeven?'* Vier deelvragen zijn geformuleerd om deze vraag te beantwoorden:

1. Wat houdt cultuur in de bouwsector in?
2. Wat zijn doorslaggevende factoren voor het ontstaan van geschillen?
3. Wat zijn de belangrijkste factoren die de succesvolle implementatie van digitale technologieën in geschillenbeslechting beïnvloeden?
4. Wat zijn de belangrijkste elementen van effectieve geschillenbeslechting en welke aspecten van cultuur beïnvloeden dit?

Het doel van deze studie is om te identificeren hoe cultuur digitale geschillenbeslechtingspraktijken kan vormgeven, om zo een effectief advies te ontwikkelen ter verbetering van het beslechtingsproces in kleinschalige bouwprojecten.

2. Onderzoeksopzet

De toegepaste onderzoeksmethode bestaat uit een literatuuronderzoek en empirisch onderzoek. Om vast te leggen hoe culturen praktijken beïnvloeden, is een casestudy uitgevoerd, waarin twee projecten worden vergeleken: één uit Engeland en één uit Nederland. Het doel hiervan is om een duidelijke visualisatie te bieden van de invloed van verschillende culturen op geschillenbeslechtingspraktijken. Het literatuuronderzoek bespreekt het onderwerp cultuur en de relevante variabelen van digitale geschillenbeslechting. Vervolgens zijn de twee casussen geanalyseerd.

In elk van deze casussen zijn de institutionele culturele context en de scope beoordeeld. Verschillende belanghebbenden van beide casussen zijn geïnterviewd om hun belangen vast te leggen. In de interne casusanalyse is deze data gebruikt om te identificeren hoe dit de praktische toepassing van digitalisering van geschillenbeslechting in kleinschalige bouwprojecten beïnvloedt. In de analyse tussen de twee casussen werden de verschillen tussen beide cases onthuld. Externe validatie van de bevindingen heeft plaatsgevonden door middel van een expert panel review, bestaande uit drie medewerkers van Turner & Townsend met werkervaring in beide landen.

Tabel 2 laat de criteria zien die zijn gebruikt om de casussen te selecteren volgens het 'most similar system'-ontwerp.

Table 2: *Casus criteria per geselecteerde casus.*

Criterium	**Casus A**	**Casus B**
De projecten moeten worden uitgevoerd in dezelfde sector.	Commercieel vastgoed	Commercieel vastgoed
De projecten moeten vergelijkbaar zijn qua projecttype.	Kantoorverplaatsing en Cat B fit-out	Kantoorverplaatsing en Cat B fit-out
De projecten moeten vergelijkbaar zijn qua projectgrootte.	2350 m^2	4890 m^2
De projecten moeten vergelijkbaar zijn qua monetaire waarde.	EUR 4.1 miljoen	EUR 6.9 miljoen
De projecten moeten in de afgelopen vier jaar zijn uitgevoerd.	2024	2023
De projecten moeten vergelijkbare aanbestedingsroutes volgen.	Traditioneel	Traditioneel
Land van uitvoering	Nederland	Engeland

3. Literatuuronderzoek

Twee hoofdconcepten zijn onderzocht via de literatuur: cultuur en digitale geschillenbeslechting.

Cultuur

Er bestaan veel verschillende opvattingen en benaderingen van het concept cultuur. De definitie van cultuur die in deze studie wordt gevolgd, is geformuleerd door Ankrah and Proverbs (2004) en beschrijft dat cultuur in de bouwsector 'is wat wordt uitgevoerd, hoe en wanneer het wordt gedaan, wie erbij betrokken is en waarom dingen op een bepaalde manier worden gedaan'. Cultuur kan vanuit verschillende perspectieven worden beoordeeld, op verschillende niveaus worden bestudeerd en op diverse manieren worden geclassificeerd. In

deze studie zijn drie hoofdmodellen gebruikt die betrekking hebben op de classificatie van culturen om het concept cultuur te verklaren: de culturele niveaus, de culturele lagen en de theorie van culturele dimensies.

De literatuur beschrijft hoe cultuur wordt gezien als een hiërarchische constructie, bestaande uit verschillende niveaus die in elkaar genest zijn, van het meest macro- tot het meest microniveau. Deze studie richt zich op drie culturele niveaus: nationaal, organisatorisch en functie-specifiek, gebaseerd op de studies van Erez and Gati (2004) en Karahanna et al. (2005). Elk van deze culturele niveaus bestaat uit meerdere culturele lagen.

De culturele lagen verklaren hoe cultuur zich op verschillende dieptes manifesteert. De institutionele theorie van Scott (2014) legt uit hoe instituties, ook wel culturele niveaus genoemd, bestaan uit drie fundamentele bouwstenen: de regulatieve pilaar, de normatieve pilaar en de cultureel-cognitieve pilaar. De regulatieve pilaar verwijst naar formele regels, wetten en handhavingsmechanismen die gedrag sturen via beloningen en sancties. De normatieve pilaar bestaat uit sociale normen, waarden en verwachtingen die bepalen wat als passend gedrag wordt beschouwd. De cultureel-cognitieve pilaar weerspiegelt gedeelde overtuigingen, mentale modellen en vanzelfsprekendheden die beïnvloeden hoe individuen hun omgeving waarnemen en interpreteren. Elke van deze pilaren verschilt in de mate waarin het culturele fenomeen zichtbaar is voor de waarnemer en wordt gebruikt om de culturele lagen van het culturele lagenmodel weer te geven.

De theorie van culturele dimensies, ontwikkeld door Hofstede (2011), wordt gebruikt om gedrag binnen organisaties en nationale contexten te begrijpen en bestaat uit zes dimensies:

- **Machtsafstand:** verwijst naar hoe individuen zich verhouden tot personen met een hogere of lagere rang en in welke mate minder machtige leden van een samenleving, organisatie of instelling een ongelijke machtsverdeling accepteren.
- **Individualisme versus collectivisme:** beschrijft de mate waarin individuen geïntegreerd zijn in primaire groepen. Dit kan sterk (collectivistisch) of los (individualistisch) zijn.
- **Femininiteit versus masculiniteit:** onderzoekt de verdeling van emotionele rollen tussen vrouwen en mannen en de waarden die zij hebben. Bescheidenheid en samenwerking worden geassocieerd met femininiteit, assertiviteit en competitiviteit met masculiniteit.
- **Onzekerheidsvermijding:** betreft het niveau van stress in een samenleving bij ongestructureerde, nieuwe of onvoorspelbare situaties.
- **Langetermijn- versus kortetermijnoriëntatie:** weerspiegelt hoe samenlevingen omgaan met tijd en verandering, met een focus op de toekomst of juist op het heden en verleden.
- **Toegeeflijkheid versus terughoudendheid:** beoordeelt in welke mate samenlevingen de basisbehoeften van mensen vrij laten bevredigen. Dit kan sterk (toegeeflijk) of zwak (terughoudend) zijn.

Om de invloed van de nationale cultuur verder te onderzoeken, zijn de rechtsstelsels van zowel Engeland als Nederland beoordeeld. Beide systemen bieden een gestructureerd juridisch kader om contractueel gedrag te sturen en relaties in bouwprojecten te beheren. Het Nederlandse civiele rechtssysteem staat echter een contextuele interpretatie van contracten toe in de bouwsector, waarbij de intenties van partijen naast de tekst worden overwogen en principes zoals redelijkheid en billijkheid worden benadrukt. Het Engelse gewoonterechtsysteem daarentegen is gebaseerd op precedenten en uitgebreid, met een focus op de precieze tekst van geschreven contracten en de bindende normen die deze creëren.

Digitale geschillenbeslechting

De literatuur maakt onderscheid tussen conflicten, claims en geschillen. In deze studie worden geschillen gedefinieerd als conflicten waarbij tussenkomst van een derde partij nodig is om de uitvoering van het project te laten doorgaan. Drie hoofdmodellen zijn gebruikt om digitale geschillenbeslechting te verklaren, ontwikkeld door Cheung and Pang (2013), Marathe et al. (2017) en Liu et al. (2023).

Cheung and Pang (2013) ontwikkelde een model bestaande uit 46 basis gebeurtenissen die leiden tot bouwgeschillen, gecategoriseerd als contractueel of speculatief, afhankelijk van de combinatie waarin ze voorkomen.

Zij identificeerden contractuele onvolledigheid als de hoofdoorzaak van bouwgeschillen, omdat dit ten grondslag ligt aan beide categorieën geschillen.

Zodra geschillen zijn ontstaan, zijn methoden nodig om deze op te lossen om de uitvoering van het project door te kunnen laten gaan. In de loop der tijd zijn verschillende formele methoden voor geschillenbeslechting ontwikkeld, waarbij procederen de meest traditionele is. Echter is procederen duur en tijdrovend en wordt als aanzienlijk vijandig ervaren. Om die redenen zijn alternatieve geschillenbeslechtingsmethoden (ADR methoden) ontwikkeld, zoals arbitrage, bindend advies, bemiddeling en onderhandeling. Marathe et al. (2017) benadrukken echter de praktische ineffectiviteit van deze modellen en stellen dat de voorkeuren en belangen van belanghebbenden cruciaal zijn voor de succesvolle implementatie van geschillenbeslechtingsmethoden, in plaats van enige formeel voorgeschreven methoden.

Het laatste model dat in deze studie wordt gebruikt om digitale geschillenbeslechtingspraktijken te verklaren is ontwikkeld door Liu et al. (2023). Dit artikel beschrijft hoe bestaand onderzoek naar digitalisering van bouwprojecten zich voornamelijk heeft beperkt tot het technische aspect, wat heeft geresulteerd in veel verschillende bruikbare technologieën, maar waarbij onderzoek naar de rol van het sociale aspect ontbreekt. Liu et al. (2023) benadrukken dat dit een belangrijke reden is waarom de bouwsector ondermaats presteert in het digitale transformatieproces.

Het conceptuele framework, zoals weergegeven in figuur 1 hieronder, laat zien hoe de theorieën zijn gecombineerd om de basis te vormen voor het empirische onderzoek.

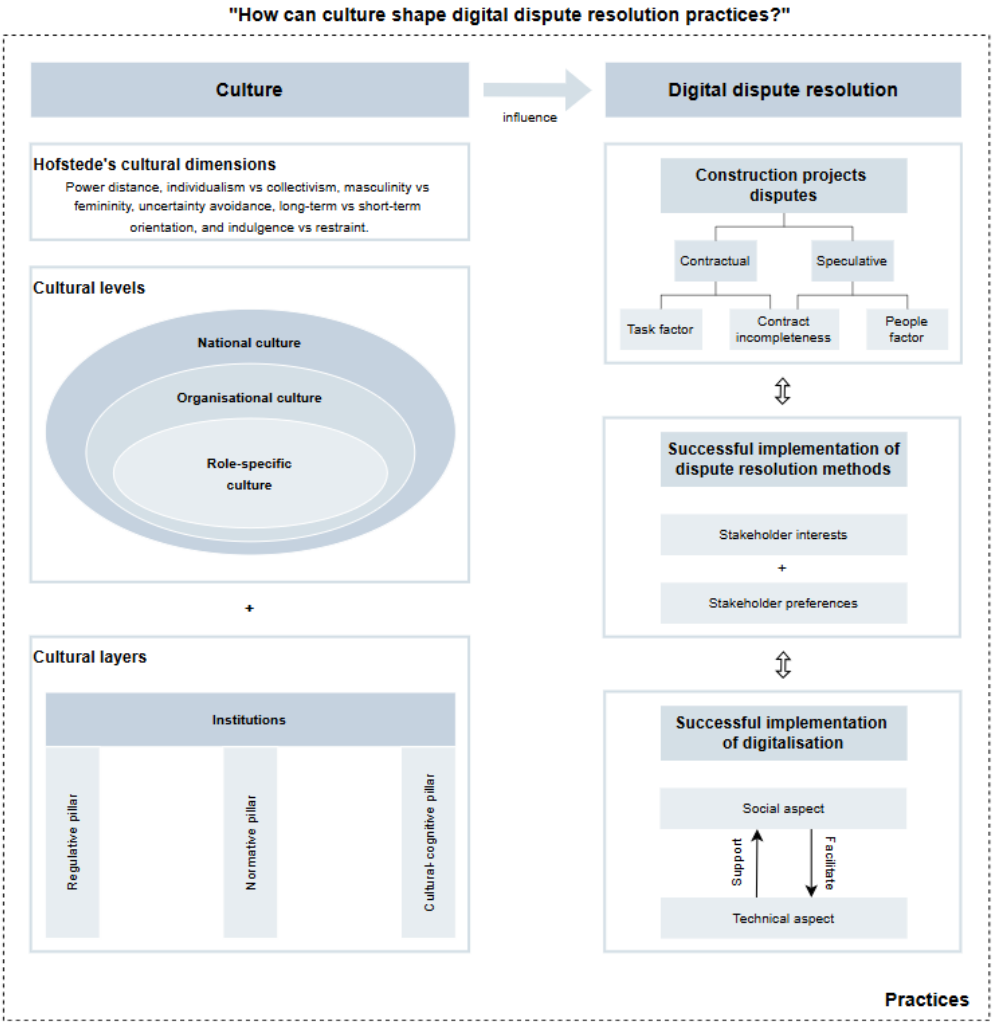

Figure 2: *Het conceptuele framework.*

4. Bevindingen

Algemene bevindingen

Het empirische onderzoek heeft aangetoond dat het identificeren van de kernoorzaak van een geschil niet essentieel is in de oplossing ervan. Hoewel oorzaakanalyse, zoals toegepast door Cheung and Pang (2013), duidelijke fouten kan identificeren en corrigeren, zijn geschillen in bouwprojecten doorgaans het resultaat van een opeenstapeling van onderliggende gebeurtenissen en, belangrijker nog, hoe deze gebeurtenissen worden behandeld. Uit de interviews bleek dat de eerste frictie vaak ontstaat tussen de opdrachtgever en de aannemer wanneer een opdrachtgever wijzigingen wil doorvoeren. De opdrachtgever realiseert zich daarbij niet welke impact dit heeft op de verplichtingen van de aannemer, omdat hij of zij onvoldoende technische kennis heeft. Naast de feitelijke omstandigheden hebben de belangen, emoties en voorkeuren van belanghebbenden een aanzienlijke invloed op zowel de aanpak als de uitkomst van geschillenbeslechting.

Uit het onderzoek bleek dat onderhandeling de meest gebruikte methode van geschillenbeslechting is bij kleine bouwprojecten. De projectmanager speelt een zeer belangrijke rol in de besluitvorming over geschikte oplossingen, aangezien hij of zij zich tussen de opdrachtgever en de aannemer bevindt, wat de partijen die doorgaans het vaakst in geschil zijn. Andere formele methoden worden zelden gebruikt vanwege de bijbehorende kosten. Belanghebbenden uit beide casussen gaven aan dat geschillenbeslechting als effectief wordt beschouwd wanneer het project binnen budget en op schema blijft, terwijl goede relaties worden behouden. De voorkeur voor onderhandeling komt voort uit het waargenomen vermogen om deze relaties te behouden en is in overeenstemming met de literatuur waarin wordt gesteld dat ADR methoden oorspronkelijk zijn ontwikkeld om kosten te verlagen en vijandigheid te verminderen.

Vergelijkbaar werd in het onderzoek vastgesteld dat in beide casussen de enige digitale technologieën die momenteel worden gebruikt voor geschillenbeslechting bij dergelijke projecten e-mailcorrespondentie en Teams zijn. E-mailcommunicatie biedt een automatische digitale auditspoor, terwijl Teams faciliteiten biedt voor externe projectvergaderingen. Hoewel deze tools over het algemeen als effectief worden beschouwd, merkten sommige belanghebbenden op dat het tijdrovend kan zijn om relevante informatie op te halen, wat wijst op een behoefte aan betere digitale organisatie. Desondanks blijft het gebruik van andere, uitgebreidere, digitale tools beperkt, voornamelijk vanwege kostenoverwegingen en een gebrek aan waargenomen voordelen.

Hoewel beide praktijkcasussen aantoonden dat een digitale auditspoor momenteel het enige gedigitaliseerde aspect is en dat onderhandeling de dominante methode is voor geschillenbeslechting in kleinschalige projecten, heeft het empirische onderzoek verschillende culturele verschillen blootgelegd in de manier waarop deze processen worden uitgevoerd. Een belangrijke observatie uit de praktijkcasussen was dat de rol van nationale cultuur en de regulatieve pilaar een aanzienlijke invloed hebben op de geschillenbeslechtingspraktijken. Verschillen tussen de Nederlandse en Engelse rechtsstelsels beïnvloeden de manier waarop geschillen worden benaderd. De Nederlandse casus weerspiegelde een voorkeur voor gezamenlijke besprekingen voorafgaand aan het verwijzen naar contractuele afspraken, wat de algemene vertrouwenscultuur in de Nederlandse bouwsector weerspiegelt. In de Engelse casus daarentegen, diende het contract als primair referentiepunt. Deze verschillen komen overeen met nationale culturele kenmerken: Nederland, dat in Hofstede's culturele dimensies wordt geclassificeerd als 'feminien', hecht waarde aan redelijkheid, billijkheid en compromissen, terwijl het Verenigd Koninkrijk, met een 'masculiene' cultuur, meer nadruk legt op gestructureerde juridische kaders en contractuele duidelijkheid.

De geïnterviewden gaven aan weerstand te hebben tegen de volledige digitalisering van het beslechtingsproces en benadrukten dat menselijke interactie essentieel is om tot een eerlijke en passende oplossing te komen. Herhaaldelijk werd vermeld dat geschillenbeslechting niet alleen draait om feitelijke gebeurtenissen, maar ook om redelijkheid. De mate waarin emoties en feiten worden gebruikt, verschilt echter per casus en komt overeen met het feminiene en masculiene karakter van beide landen. Daarnaast kent Nederland een sterke onzekerheidsvermijding, waarbij weerstand kan worden ervaren tegen innovatie, terwijl het Verenigd Koninkrijk een lage onzekerheidsvermijding heeft en innovatie juist stimuleert.

De combinatie van posities op deze twee culturele dimensies lijkt elkaar te versterken in de effectieve implementatie van digitalisering van geschillenbeslechting in de praktijk. In casus A werd opgemerkt dat een belangrijke oorzaak van geschillen de stress is die belanghebbenden ervaarden door tijdsdruk, wat de besluitvorming en het gedrag van belanghebbenden beïnvloedde. In dit geval werd vastgesteld dat een digitaal systeem deze emoties en onderliggende denkprocessen niet in aanmerking zou kunnen nemen. De Nederlandse bouwsector hecht veel waarde aan de manier waarop situaties worden geïnterpreteerd en de onderliggende gedachtes, waardoor emoties ook een significante rol spelen in de industrie in plaats van puur feiten. Dit benadrukt het belang van menselijke betrokkenheid bij geschillenbeslechting en de weerstand tegen digitale technologieën om dit te vervangen. In casus B toonde het empirische onderzoek echter aan dat feiten een grotere rol spelen dan emoties, wat de contractueel georiënteerde bouwsector in Engeland weerspiegelt. In dit geval werd opgemerkt dat Turner & Townsend een intern digitaal portaal heeft ontwikkeld om wijzigingen binnen een project bij te houden, maar dat de gegevensinvoer efficiënter zou kunnen. Dit bevestigt het masculiene, resultaatgerichte karakter van het Verenigd Koninkrijk. Het gebruik van een extern digitaal hulpmiddel om de efficiëntie van die gegevensinvoer te vergroten is echter niet mogelijk, omdat dit de vertrouwelijkheidsregels van het bedrijf zou schenden. Dit legt beperkingen op aan het gebruik van soortgelijke technologieën.

Validatie

Op basis van de bevindingen zijn drie stellingen geformuleerd. Deze stellingen zijn gevalideerd door drie experts van Turner & Townsend in de bouwsector, die werkervaring hebben in zowel Engeland als Nederland. De stellingen waren als volgt:

I. Als de projectmanagementorganisatie het gebruik van digitale technologieën stimuleert, zijn opdrachtgevers en aannemers eerder geneigd om deze technologieën te gebruiken.

II. Als het vertrouwen in een digitaal systeem om een eerlijke en redelijke beoordeling te maken wordt vergroot, kan dit de menselijke connectie in geschillenbeslechtingspraktijken vervangen.

III. Een effectief ontwerpelement voor digitale geschillenbeslechting is wanneer technische informatie tussen de aannemer en de architect blijft, en de projectmanager de opdrachtgever hierover slechts informeert.

Bij stelling I was de belangrijkste opmerking dat de experts niet dachten dat het effectief zou zijn als een projectmanagementorganisatie zou investeren in digitale technologieën om geschillen in kleinschalige projecten te voorkomen. Dit kwam vooral door de kosten en de tijd die nodig is om aanbestedende instanties op te leiden en hen de voordelen van de technologie te laten begrijpen. Een tweede belangrijke opmerking was het grote aantal verschillende producten dat beschikbaar is, en het feit dat organisaties hetzelfde product op verschillende manieren gebruiken. Met betrekking tot digitale technologieën voor geschillenbeslechting waren de experts het erover eens dat een digitale auditspoor nuttig is om discussies te onderbouwen.

Bij stelling II waren de experts unaniem van mening dat de menselijke connectie in geschillenbeslechting nooit volledig zou kunnen worden vervangen door een digitaal systeem. De belangrijkste reden hiervoor was dat menselijke elementen een rol spelen in geschillen, die volgens de experts onmogelijk volledig door een digitaal systeem gekwantificeerd kunnen worden. De experts merkten echter wel op dat een digitaal systeem waardevol zou kunnen zijn voor het doorzoeken van documenten en informatie om een eerste beoordeling van een geschiloplossing te geven.

Stelling III werd als niet kloppend beschouwd. Hoewel opdrachtgevers mogelijk niet alle technische informatie volledig begrijpen, is het volledig uitsluiten van deze informatie niet bevorderlijk.

5. Discussie

Over het algemeen boden de in het literatuuroverzicht besproken theorieën een solide basis voor het empirische onderzoek. De bevindingen van het empirische onderzoek kwamen overeen met de kaders van Erez and

Gati (2004) en Karahanna et al. (2005) (culturele niveaus), Scott (2014) (culturele lagen), Marathe et al. (2017) (succesvolle implementatie van geschillenbeslechtingsmethoden) en Liu et al. (2023) (succesvolle implementatie van digitalisering). De theorie van culturele dimensies van Hofstede (2011) bleek echter niet volledig bruikbaar om de invloed van cultuur op digitale geschillenbeslechtingspraktijken te verklaren. Van de zes culturele dimensies bleken er slechts twee verband te houden met deze praktijken: femininiteit versus masculiniteit en onzekerheidsvermijding. Nederland wordt beschreven als een feminiene cultuur, waarin conflicten worden opgelost door onderhandeling en consensus, terwijl het Verenigd Koninkrijk een masculiene cultuur heeft, waarin besliskracht en resultaatgerichtheid worden geprioriteerd. Dit culturele verschil komt tot uiting in de manier waarop emoties en contracten worden meegenomen bij het oplossen van geschillen. De positie van de cultuur op het gebied van onzekerheidsvermijding bleek in tegenspraak te zijn met de structuur van het rechtssysteem van het land, maar versterkt de observaties die zijn gedaan over de houding ten opzichte van digitalisering van geschillenbeslechting. De andere vier dimensies, machtsafstand, individualistisch versus collectivistisch, langetermijn- versus kortetermijnoriëntatie en toegeeflijkheid versus terughoudendheid, bleken in dit onderzoek geen invloed te hebben op de vorming van digitale geschillenbeslechtingspraktijken.

Het model van Cheung and Pang (2013) werd gebruikt om de oorzaken van bouwgeschillen te identificeren om zo een geschikte geschillenbeslechtingsmethode te bepalen. Het empirische onderzoek heeft echter aangetoond dat het identificeren van de basale gebeurtenis van een geschil niet noodzakelijk is om een effectieve geschillenbeslechtingsmethode vast te stellen. Daarnaast identificeerde Cheung and Pang (2013) contractuele onvolledigheid als de hoofdoorzaak van bouwgeschillen, omdat dit ten grondslag ligt aan zowel contractuele als speculatieve geschillen. Het empirische onderzoek toonde aan dat contractuele onvolledigheid weliswaar tot conflicten leidt, maar niet per definitie tot geschillen. Een opeenstapeling van basisgebeurtenissen, gecombineerd met de menselijke factor, inclusief emoties die strategisch worden ingezet, de inspanning die in een project wordt geïnvesteerd, het gebruik van menselijke termen in contractdocumenten, interpretaties en afhandeling, is het belangrijkste aspect van conflicten die uitmonden in geschillen. De rol van de menselijke factor had niet in beide onderzochte casussen dezelfde impact en werd over het algemeen als significanter waargenomen in het Nederlandse project dan in de Engelse casus.

6. Limitaties

Er zijn een aantal beperkingen van toepassing op dit onderzoek. De eerste beperking is dat er een beperkt aantal belanghebbenden is geïnterviewd voor casus B. Het bleek moeilijk om contact te leggen met de opdrachtgever, aannemer en architect van dit project. Daarnaast was het niet mogelijk om de projectmanager van dit project te interviewen. Doordat deze belanghebbenden niet zijn geïnterviewd, konden dergelijke vergelijkingen van culturele verschillen en overeenkomsten niet worden gemaakt, wat de overdraagbaarheid van de onderzoeksresultaten beïnvloedt.

De tweede beperking is dat veel van de geïnterviewden geen eerdere ervaring hadden met digitale technologieën in geschillenbeslechting en daardoor geen eerstehands ervaringen konden delen over verschillen in het proces met of zonder deze technologieën. Dit maakte het moeilijker om de gunstige kenmerken van dergelijke systemen te identificeren en te bepalen welke elementen mogelijk overbodig zijn, wat de validiteit van de onderzoeksconclusies beïnvloedt.

Ten derde bleven de discussies in casus B algemeen en gericht op potentiële geschillen die in een project zouden kunnen ontstaan. De meer gedetailleerde kwesties die werden beschreven, komen niet direct overeen met de definitie van geschillen zoals gehanteerd in dit onderzoek, wat een effect heeft op de overdraagbaarheid van de onderzoeksresultaten.

De vierde beperking heeft betrekking op de validatie, die plaatsvond in twee afzonderlijke bijeenkomsten in plaats van één gezamenlijke bijeenkomst. Hierdoor konden de experts de resultaten niet gezamenlijk met hun drieën bespreken, wat de generaliseerbaarheid van de validatieresultaten beïnvloedt.

Tot slot betekent het beperkte aantal praktijkcasussen dat in dit onderzoek is betrokken, en daarmee de beperkte hoeveelheid data, dat de uitkomsten van deze studie niet automatisch kunnen worden toegepast op andere projecten.

7. Conclusie

De hoofdonderzoeksvraag van deze studie heeft als doel een effectief advies te ontwikkelen om het geschillenbeslechtingsproces in kleinschalige bouwprojecten te verbeteren. Cultuur kan digitale geschillenbeslechtingspraktijken op de volgende manieren beïnvloeden:

1. Het juridische systeem van een land
Het juridische systeem van een land beïnvloedt de succesvolle implementatie van digitalisering in geschillenbeslechtingspraktijken. Mensen in een op consensus gebaseerd juridisch systeem vertonen feminien gedrag en tonen weerstand tegen digitalisering op de lagere culturele niveaus. Een digitaal systeem zou in dit geval beperkt zijn tot het beoordelen van documenten om te verifiëren of bepaalde parameters hebben geleid tot vertraging. Dit kan het evaluatieproces versnellen en de transparantie vergroten, terwijl menselijke interactie behouden blijft om te bepalen hoe de informatie wordt gebruikt. In een contractueel georiënteerd juridisch systeem vertonen individuen masculien, resultaatgericht gedrag en staan zij meer open voor digitale technologieën in geschillenbeslechting. Digitalisering kan op grotere schaal worden toegepast dan in een op consensus gebaseerd systeem, omdat het ook kan worden gebruikt om een eerste beoordeling te maken van de toewijzing van verantwoordelijkheden en om kosten te berekenen door de impact van vertragingen vast te stellen.

2. Weerstand van organisaties
Organisaties zullen over het algemeen niet investeren in digitale technologieën in kleinschalige projecten vanwege de kosten en de tijd die nodig is om de aanbestedende instanties binnen een projectteam op te leiden en hen de voordelen van het gebruik van de technologie te laten begrijpen. Daarnaast verkleinen de grote verscheidenheid aan beschikbare producten en het feit dat organisaties hetzelfde product op verschillende manieren kunnen gebruiken de kans dat organisaties investeren in digitale technologieën om geschillen in kleinschalige projecten te voorkomen. Aangezien projectmanagers vaak degenen zijn die verschillende oplossingen beoordelen en verantwoordelijk zijn voor de besluitvorming in kleine projecten, zouden hun organisaties moeten investeren in digitale technologieën om geschillen op te lossen. Op deze manier hoeft alleen de projectmanagementorganisatie te worden getraind in het gebruik van de technologie en wordt een uniforme toepassing van de technologie gefaciliteerd.

3. Regels binnen het bedrijf
Regels binnen een bedrijf beïnvloeden de mogelijkheden van bepaalde digitale technologieën en beperken daarmee het gebruik ervan. Organisaties zouden moeten investeren in de ontwikkeling van een intern digitaal systeem om ervoor te zorgen dat het voldoet aan de bedrijfsreglementen. Op deze manier kan het systeem toegang krijgen tot alle relevante informatie die nodig is voor geschillenbeslechting.

8. Aanbevelingen

De aanbevelingen van dit onderzoek zijn onderverdeeld in aanbevelingen voor de praktijk en voor verder onderzoek.

Aanbevelingen voor de praktijk

1. Beoordeel de culturele positie van het projectteam
Laat de projectmanager de culturele positie van het projectteam beoordelen, met name op de culturele dimensies feminiteit versus masculiniteit en onzekerheidsvermijding. Deze dimensies verklaren de consensus- of resultaatgerichte focus van het projectteam en de houding tegenover technische innovatie in geschillenbeslechting. Op deze manier kan de projectmanager zich vertrouwd maken met de kenmerken van dergelijke

samengestelde projectteams en leren hoe hiermee om te gaan. Dit laat het geschillenbeslechtingsproces op lange termijn soepeler verlopen en versterkt de elementen van effectieve geschillenbeslechting.

2. Investeer in een digitaal systeem ter ondersteuning van geschillenbeslechting, niet ter preventie
Projectmanagementorganisaties zouden moeten investeren in digitale technologieën ter ondersteuning van het geschillenbeslechtingsproces, in plaats van ter preventie van geschillen. Op deze manier hoeft alleen deze organisatie te worden getraind in het gebruik van de technologie en wordt een uniforme toepassing van de technologie vergemakkelijkt. Bovendien zal de technologie, aangezien deze binnen de projectmanagement-organisatie wordt ontwikkeld, automatisch voldoen aan de bedrijfsreglementen, waardoor toegang wordt gegarandeerd tot alle relevante informatie die nodig is voor het oplossen van geschillen.

3. Combineer cultuur met de ontwikkeling van de digitale technologie
De mogelijkheden van een digitaal systeem zijn afhankelijk van de cultuur binnen het projectteam. Daarom moeten de mogelijkheden van het technische systeem worden afgestemd op de culturele voorkeuren van het projectteam. Dit zal de succesvolle implementatie van digitalisering bevorderen om het geschillenbeslechtings-proces te verbeteren.

Aanbevelingen voor verder onderzoek

1. Betrek een breder scala aan deelnemers om beter inzicht te krijgen in de belangen van de belanghebben-den en de verschillen in deze belangen tussen de projecten.
2. Vergelijk traditionele en geïntegreerde contracten om een meer alomvattend begrip te krijgen van hoe de regulatieve cultuur digitale geschillenbeslechtingspraktijken kan vormgeven.
3. Betrek andere landen om de kennis over de impact van juridische systemen op digitale geschillenbe-slechtingspraktijken uit te breiden.
4. Richt meer aandacht op de definitie van geschillen om een duidelijke afbakening van geschillenbeslechting in kleinschalige projecten te waarborgen.
5. Ontwikkel digitale technologieën zoals voorgesteld in deze studie om de praktische effectiviteit te testen en verdere ontwikkelingen te stimuleren.

9. Reflectie

Hoewel cultuur niet altijd op de voorgrond staat, is het een belangrijke factor bij veranderingen in de bouwindustrie. Het wordt weerspiegeld in het gedrag en de denkwijze van mensen binnen de industrie en moet actief worden aangepakt en onderzocht om effectieve veranderingen binnen de sector te garanderen. Dit onderzoek laat zien dat theorie en praktijk niet altijd op één lijn liggen. Mensen in de sector zien graag concrete ideeën en acties om concepten tastbaar te maken. De aanbevelingen in dit onderzoek bieden een goede basis om de bevindingen in de praktijk toe te passen en geven praktijkmensen inzicht in hoe digitale technologie effectief kan worden gebruikt in geschillenbeslechtingspraktijken om het beslechtingsproces te verbeteren.

Vanwege het beperkte aantal deelnemers aan dit onderzoek zijn de bevindingen en conclusies echter niet automatisch toepasbaar op de bouwindustrie als geheel. Het zijn de eerste bevindingen in deze context en bieden academici nieuwe inzichten in de relatie tussen cultuur en projectprocessen en stimuleren verder onderzoek.

1. Introduction

In this chapter, the research context and scope of this study are addressed, after which the problem statement and research gap are identified. This is followed by the scientific and societal relevance and the objectives of this research. Lastly, the structure of the rest of the report is described.

1.1 Research context and scope

It is generally known that construction projects tend to go over budget and undergo delays. According to Flyvbjerg and Gardner (2023), 91.5 percent of projects go over budget, over schedule, or both. Delays in project delivery often lead to disputes between contractors and clients, especially around the causes of delays and their impact on the critical path of the project schedule (Jacobs & Meesters, 2022). Delays of the project delivery and resolving of the disputes related to these delays often manifest themselves in additional costs that must then also be allocated to the responsible party.

Dispute resolutions aim to resolve the disputes arising in construction projects. However, the resolution process can take a long time resulting in budget exceedances, schedule overruns and even damaging of partnering relationships (Assah-Kissiedu et al., 2010). These issues have initiated a common interest among researchers in different countries to understand the nature of the causes of construction disputes, in order to formulate measures to prevent or minimise their occurrence or to resolve them quickly, efficiently and cost-effectively (Assah-Kissiedu et al., 2010; Farooqui et al., 2014).

In recent years, a surge of interest in the potential of digitalisation to enhance the resolution of disputes has been observed in the literature. The study by Giacalone and Sajedeh Salehi (2022) focused on digitalisation of small claims procedures in the consumer industry, using digital tools to modify and potentially improve existing procedures. According to them, digitalisation can indeed increase the efficiency of dispute resolution by reducing excessive procedural length and costs. Additionally, Bumann and Peter (2019) and Unruh and Kiron (2017) note that digitalisation is able to improve business processes, and Liu et al. (2023) state that digitalisation of construction projects is urgently required in construction organisations to align digital technology and organisational conditions. Combining these studies sets the basis for this research, focussing on digitalisation of dispute resolutions in the construction industry.

However, the study by Liu et al. (2023) emphasises that existing research on digitalisation of construction projects has mainly been limited to the technical aspect, lacking research on the role of the social aspect. In addition, Marathe et al. (2017) show that successful implementation of dispute resolution methods is not solely dependent on technological solutions. They find that interpersonal relations play a key role for the successful implementation of dispute resolution methods and that human factors were perceived as more important than formally stipulated conditions. These formal conditions are traditional resolution methods such as litigation, arbitration, adjudication, and mediation. In their study, Marathe et al. (2017) state that these methods can be developed theoretically in any given way, but that practice shows that they rarely work as planned. Instead, the most important factors for dispute resolution are mutual understanding and relationship between the parties (Marathe et al., 2017).

Hofstede (2001) describes how cultures significantly shape individuals' preferences and values, which manifest in the form of practices and behaviour. Ankrah and Proverbs (2004) describe how culture must be an

important consideration for every organisation in every industry. Additionally, Ankrah and Proverbs (2004) and Hall (1999) emphasise that the impact of culture is even more pronounced in the building industry than in any other industry due to the project-based arrangements that characterise the built environment.

Although Flyvbjerg's expertise lies in the domain of mega projects, the 91.5 percent of projects included in his study encompass a diverse range of projects, from large and complex undertakings such as underwater tunnels to small-scale construction works like home renovations, and everything in between. Small building works are an established vital part of the construction industry accounting for the largest proportion of works within the industry and the majority of the industry's revenues (Griffith & Headley, 1995; McKinsey & Company, 2020). Combining this with the findings of Liu et al. (2023), Marathe et al. (2017), and Ankrah and Proverbs (2004), this research aims to identify how culture can shape digital dispute resolution practices to improve the resolution process in small-scale construction projects.

To capture how cultures affects practices, a comparative case study is done. The case study presented in this research compares two projects, one from England and one from the Netherlands, with the objective of providing a clear visualisation of the influences of different cultures on dispute resolution practices. By doing so, the study will be able to identify how stakeholders from both countries influence the practical use of digitalisation of dispute resolution in small-scale construction projects, considering both its opportunities and barriers.

1.2 Problem statement and research gap

With the information from the previous section, the problem statement can be formulated. One of the main components of the problem statement are that despite the convictions that digitalisation is required to improve construction organisations, it is not yet widely applied in practice. A second important component is largely derived from the studies by Liu et al. (2023), Marathe et al. (2017), and Ankrah and Proverbs (2004). Liu et al. (2023) mention that existing literature on digitalisation of construction projects lacks research on the impact of the social aspect. The study by Marathe et al. (2017) emphasises that the most important factors for the successful implementation of dispute resolution methods are mutual understanding and the relationship between the parties. Additionally, Ankrah and Proverbs (2004) describe that culture has the ability to shape behaviour of individuals and groups of people, but that it has not yet been extensively researched how this works. Combining these three studies, the problem statement is identified, which lies in the insufficient knowledge on how culture within the building industry influences the successful implementation of digital dispute resolution practices. From this problem statement, the research gap, illustrated in figure 1.1, is derived.

1.3 Scientific and societal relevance

The relevance of this research can be divided in the scientific and societal relevance and builds further upon the problem statement and the research gap acknowledged. Despite the surge in interest in the potential of digitalisation to enhance the efficiency of dispute resolution and its theoretically proven effectiveness to increase efficiency, digitalisation is not widely applied in practice. The existing literature lacks a comprehensive understanding how culture can shape digital dispute resolution practices. This research will address this research gap, which will provide insights how to use digital in dispute resolution and how that will shape practices, with the aim to improve the dispute resolution process. By enhancing the dispute resolution process, this study seeks to contribute to scientific knowledge in the field. Furthermore, the construction industry has long been recognised for its resistance to change and the challenges associated with implementing transitions (Aigbe et al., 2024; Eze et al., 2023; Moradi & Sormunen, 2023). By showing how culture can shape digital dispute resolution practices, considerations for successful transitions in the construction industry are clarified, which will contribute to the knowledge for future transitions. In addition, the use of a comparative case study of projects in England and the Netherlands provides valuable insights into how legal systems and behavioural culture influence each other. These findings will expand theoretical knowledge of

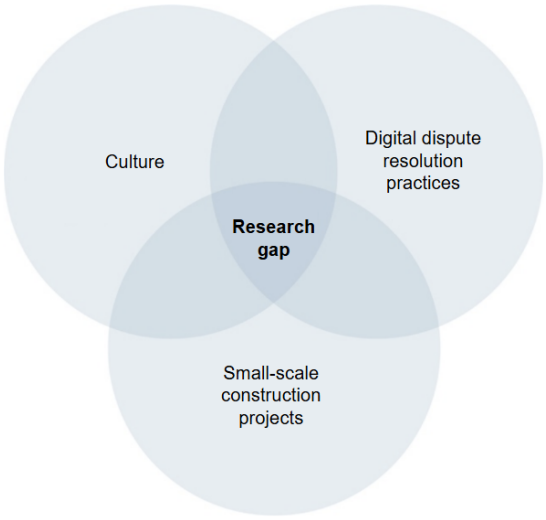

Figure 1.1: *The gap of knowledge between culture and digital dispute resolution practices in small-scale construction projects.*

the interplay between legal systems and the behaviour of individuals, groups, and organisations.

The societal impact of this research focuses on providing an addition to the body of knowledge on culture and its manifestation and impact on the process and product of construction businesses. Ankrah and Proverbs (2004) described how culture has the ability to shape the behaviour of individuals and groups of people as in countries, industries, and organisations. This research provides insight in how culture influences digital dispute resolution practices in order to establish an effective advice on how to successfully implement digital technologies in dispute resolution practices to improve the resolution process. Additionally, the construction sector contributes significantly to national economies by driving economic growth and its integral effect in supporting global goals such as the Sustainable Development Goals (SDGs) set by the United Nations (Alaloul et al., 2022; United Nations, 2015). Since small-scale construction projects form a significant portion of the building industry, and the essential role that the construction industry plays in economic development and societal well-being, this research' societal relevance extends beyond economic aspects to environmental sustainability and social development (Fei et al., 2021; McKinsey & Company, 2018).

1.4 Objectives

The primary goal of this research is to give the building industry insight in how to improve the dispute resolution process in small-scale projects. Through a comparative case study of office fit-out projects in England and the Netherlands, the study will explore how cultures shape resolution practices. The objectives of this study related to this primary aim are outlined below:

1. Create value for the construction industry by providing advice to improve the dispute resolution process.
2. Give insight in how to use digital technology in dispute resolution practices.
3. Add substantial knowledge to the academic literature on what the determining aspects of culture are that influence the successful implementation of digital dispute resolution methods.

1.5 Reading guide

In chapter 2, the research questions of this study are presented. Chapter 3 discusses the research design of this study, including the methodology and limitations of the used methods. The literature review is provided in chapter 4, discussing all relevant theoretical aspects for this research. In chapter 5, the empirical research

is described. The findings and validation of the research are presented in chapter 6. Next, the various aspects the literature, empirical research, and findings are discussed in chapter 7, including limitations of the research. In chapter 8, conclusions on the research questions are presented, and recommendations for practice and further research are provided. In addition, the author reflects on the outcomes, process, and personal experiences of the research.

2. Research questions

Based on the problem statement and the research gap, the following main research question is formulated:

'How can culture shape digital dispute resolution practices?'

The question uses the term 'can', which makes the question future-oriented and thus focused on the design of a future system. The aim of this study is to identify how culture can shape digital dispute resolution practices in order to develop an effective advice to improve the resolution process in small-scale construction projects. To achieve this, a case study is conducted, in which two projects are compared to explore the influence of culture on these practices. One of these projects is constructed in England, whereas the other is constructed in the Netherlands. The goal of this study is to provide a clear visualisation of the influences that culture has on the successful implementation of digital dispute resolution practices.

To be able to answer this main question, a number of sub-questions have been formulated. Table 2.1 presents the sub-questions and the purpose of each question for this research.

Table 2.1: *The sub-questions and their purpose.*

Question	**Purpose**
1. What does culture in the building industry entail?	To gain insight in what culture in the building industry entails and how this can influence practices.
2. What are decisive factors for disputes to occur?	Sets the basis to determine the role of culture in the occurrence of disputes and what resolution methods are used.
3. What are the most important factors influencing the successful implementation of digital technologies in dispute resolution?	Examines the gap between theoretically developed and practically employed methods and whether these are part of culture.
4. What are the most important elements of effective dispute resolution and what aspects of culture influence it?	Sets the basis to develop an effective advice to implement digital dispute resolution methods based on the determining factors of sub-question 2 and 3.

3. Research design

To answer the main research question, a clear structure is needed that balances theoretical information with practical insights, while exploring the role of digitalisation in dispute resolution in both England and the Netherlands. Comparative research of small-scale projects in these countries was conducted, to reveal cultural difference in order to explore the influence of culture on dispute resolution practices and how digitalisation of these practices can be shaped.

3.1 Research method

This study used a qualitative research method, including both a theoretical framework as well as a practical application. The approach of a qualitative research method was used because of the nature of the main research question, which is aimed to develop new theories. According to Bryman (2016), this approach requires qualitative research methods. In figure 3.1, the relation between the research methods and the research questions is illustrated. With qualitative research it is essential to remain unbiased and as objective as possible to prevent inaccurate results (Alshenqeeti, 2014; Cohen et al., 2007; Hammersley & Gomm, 2008; Linneberg & Korsgaard, 2019; Marathe et al., 2017). Another important notion is the necessity of maintaining a constant focus on the primary research question. This ensures that the research method employed is appropriate for accurately answering this question.

3.1.1 Literature review

A literature review was conducted to reveal what was already known about the topic, how and by whom the topic had been researched, and what controversies existed about the topic (Bryman, 2016). In chapter 4, the literature review on the relevant aspects for this research are discussed. These aspects are culture, legal systems, construction disputes and resolution methods, and digital developments. The information gathered in the literature review has been synthesised and placed in a conceptual framework that provided an overview of the current knowledge and formed the basis for the empirical research.

3.1.2 Empirical research

The practical application of this research method consisted of an in-case and cross-case analysis. The sources in these case studies included documentation, exploratory conversations, interviews, and participant observations. The primary source of information in the case studies was the interviews. In the interviews, practical insights were gained from participants that had been involved in small-scale projects constructed in either England or the Netherlands. Interviews are widely recognised as an accepted and valuable method for gathering qualitative data in academic research (Bryman, 2016; Creswell & Creswell, 2009; Dean, 2007; Patton, 2002; Sayer, 2011; Silverman, 2011). By using case studies in the interviews, an in-depth investigation of a contemporary phenomenon within its real-life context can be executed, revealing the inner workings and interactions of an organisation or individual (Schoch, 2019). Case studies are often used for research that focuses on explaining, exploring, describing, and understanding. Research questions that accompany these types of research use words such as ‘how’ or ‘why’ (Schoch, 2019). In the interviews, the participants were asked to describe the disputes they had encountered, the methods used to resolve them, and how they perceive effective resolution methods. They were also asked to describe their views on digitalisation of the

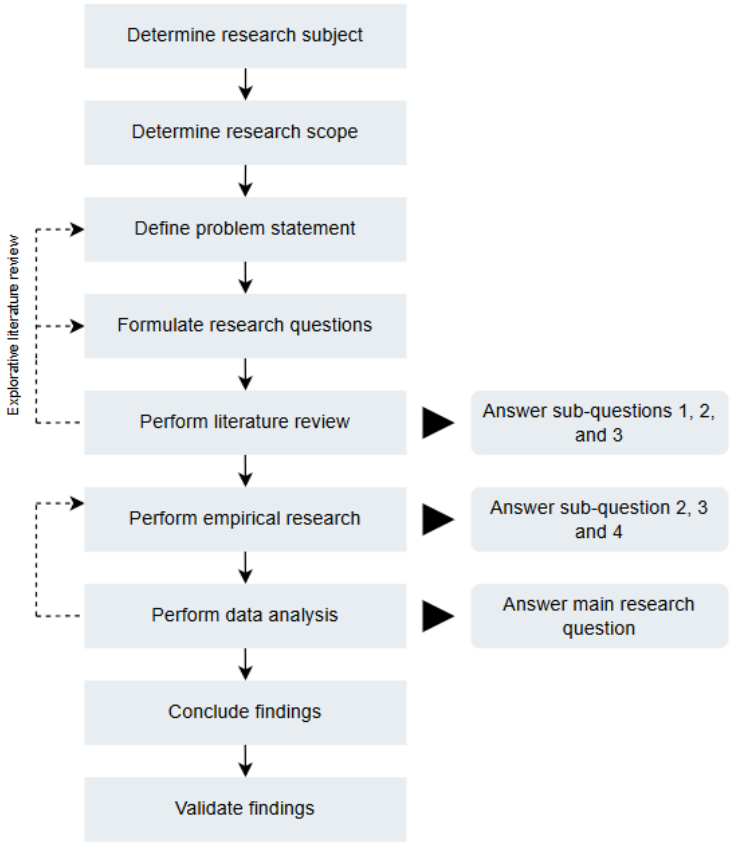

Figure 3.1: *The relation between the research methods and answering of the research questions.*

dispute resolution process, including their perceptions on the barriers and opportunities, with a focus on both the practical (e.g. cost, time, technology) and cultural (e.g. trust, confidentiality, resistance to change) aspects.

The insights derived from the interviews were used both to understand how practices are influenced by formal (e.g. legal, contractual) and informal (e.g. behaviour, norms) aspects, and to identify opportunities for digitalisation within these practices. These insights formed the basis of the comparative analysis, which allowed to connect the responses from the participants to the conceptual framework to identify key cultural aspects of how digitalisation of the dispute resolution process could be shaped.

3.2 Data gathering and data requirements

It was important to ensure that both the theoretical framework and the empirical data (interviews and case studies) adhered to rigorous academic standards. This section gives a breakdown of accepted sources for the theoretical framework, as well as data requirements for the theoretical framework, interviews, and case selection.

3.2.1 The theoretical framework

Accepted literature for the theoretical framework are peer-reviewed journals, books and academic textbooks, conference proceedings, government and industry reports, and standards and guidelines (Booth et al., 2016; Creswell & Creswell, 2009; Flick, 2009; Hart, 2018; Yin, 2018). The latter are, for example, formal contractual frameworks. Dissertations and theses may be considered scholarly sources since they are closely supervised by a dissertation committee of scholars, are directed at an academic audience, are extensively researched, follow

research methodology, and could be cited in other scholarly work (Creswell, 2007; Hart, 2018). However, dissertations are still considered student work and are not peer-reviewed. The use of these sources, therefore, had to be with caution to ensure the quality of the source. Suitable databases of the sources for the theoretical framework are academic databases like Scopus, Google Scholar, or institutional repositories. Data requirements for the theoretical framework were that the data had to be credible, relevant, and recent. Literature often refers to recent data to be within the last five to ten years (Booth et al., 2016; Creswell & Creswell, 2009; Hart, 2018; Moher et al., 2015).

Another source that was used for the theoretical framework were conversations with legal experts, both on specific contractual frameworks as well as people familiar with the Dutch and English legal systems. These conversations helped explaining both behaviour and practices.

3.2.2 Case study

To be able to make a meaningful cross-case analysis, a uniform framework had to be used in the analysis of these cases (Yin, 2018). This research followed the 'most similar systems' design, discussed in the study by Przeworski and Teune (1970). This method draws on the logic that the cases compared are similar in all but one independent variable and that differ in the outcome variable. Such a comparison should then be consistent with the inference that the difference in the single independent variable that varies between the cases accounts for the difference in the dependent variable. In the study by Yin (2018), the importance of selecting relevant cases that align with the research focus is emphasised. For this research, completed small-scale construction projects in England and the Netherlands were selected. The study of Eisenhardt (1989) stresses the importance of selecting cases where key events or phenomena have occurred, which reflects the view of Roller and Lavrakas (2015). In their studies, they have identified that the selection of the unit of analysis is one of the first steps in the qualitative data analysis process. According to them, the unit of analysis refers to the portion of content that will be the basis for decisions made during the development of codes. In this research, the events as described by Eisenhardt (1989) were the occurrences of disputes and the implementation of dispute resolutions. Finally, Baxter and Jack (2008) and Stake (1995) highlight the importance of securing access to detailed data from participants and case documentation. Ensuring that participants of the selected cases can provide relevant documentation (e.g. contracts and dispute outcomes) was vital for a thorough investigation.

3.2.3 Interviews

For the interviews to be scientifically valid and reliable, certain requirements needed to be met. These requirements are sufficient sample size, relevant participants, informed consent of the participants, data reliability, and data triangulation. In table 3.1 these data requirements and the scientific context are listed. The requirement of participant relevance is further elaborated in section 3.2.4.

3.2.4 Interviewees

In the studies by Creswell (2007) and Patton (2002) it is emphasised that the relevance of the participants in interviews is crucial, as only individuals with direct experience in the research topic can provide valuable insights. Legal experts, for example, have different knowledge than stakeholders in construction projects. Interviewees in the case studies of this research consisted of the project manager, the cost manager, the client, the contractor, and the architect. This way, the information retrieved from the interviews in the case studies consisted of a variety of perspectives necessary to assess how digitalisation of dispute resolution practices should be shaped to improve the resolution process across varying contexts. In order to ensure the consistency of the interviews, it is essential to implement a standardised interview protocol (Schoch, 2019). This protocol may vary depending on the specific group being interviewed. In this research project, the exploratory conversations adhered to a distinct protocol than that of the interviews conducted.

Table 3.1: *Data requirements for the interviews.*

Requirement	Context
Sufficient sample size	The studies by Guest et al. (2006) and Mason (2010) discuss the concept of data saturation in qualitative research, noting that smaller sample sizes, typically between 8 and 12 interviews, are often sufficient to capture diverse perspectives in qualitative studies.
Participant relevance	Participant relevance is crucial, as only individuals with direct experience in the research topic can provide valuable insights (Creswell, 2007; Patton, 2002). In this research, the interviewees were stakeholders involved in small-scale construction projects where disputes emerged. Participant relevance guarantees that the data collected is both relevant and meaningful to the study's objectives.
Informed consent	Informed consent is an ethical requirement in qualitative research, ensuring that participants understand how their data will be used and have voluntarily agreed to participate (Orb et al., 2001). This protects the rights of the participants and upholds the ethical standards of the research (Wiles et al., 2008).
Data reliability	Data reliability refers to the accuracy and consistency of the data collected. To achieve this, interviews were recorded and transcribed verbatim, ensuring that participant responses were captured fully and accurately (Silverman, 2011).
Data triangulation	Data triangulation involves the use of multiple data sources or methods to cross-validate findings, enhancing the credibility and robustness of the research (Carter et al., 2014; Flick, 2009). In this study, triangulation involved combining the interview data with the conceptual framework developed based on the literature review, providing a more comprehensive understanding of the issues being studied.

3.3 Data analysis

According to Schoch (2019), the analysis of data from case studies involves three steps: describing, emergence of findings, and comparing. Schoch (2019) describes that the descriptive phase of the data analysis involves understanding the who, what, when, and where of the situation that is studied. This has been done in the preparation-phase of the empirical research.

In the second phase, findings in the form of patterns, themes, or categories, are retrieved from the qualitative data. Bernard and Ryan (1998) provide a useful typology for understanding the range of qualitative data and useful data analysis methods for these data types, see figure 3.2. The first branch of the tree distinguishes three basic data types: text, images, and sound. Though the data in the case study was retrieved from interviews, which can be interpreted as either sound or video image, the interviews were transcribed, converting the data into text, thus considering this branch. The second distinction made in the typology pertains to how the text is viewed related to the object of analysis. When one is interested in individuals' perceptions, feelings, knowledge, and behaviour as represented in the text, which is often generated by the interaction of the researcher with the research participants, the text can be analysed as a proxy for experience (Bernard & Ryan, 1998). Following this branch, another distinction is made in ways the data can be collected and analysed. Systematic elicitation is typically extracted from more structured data than free-flowing text, such as semi-structured interviews, which was used in this study (Guest et al., 2012). According to the typology, free-flowing text analysis can either be word-based or code-based.

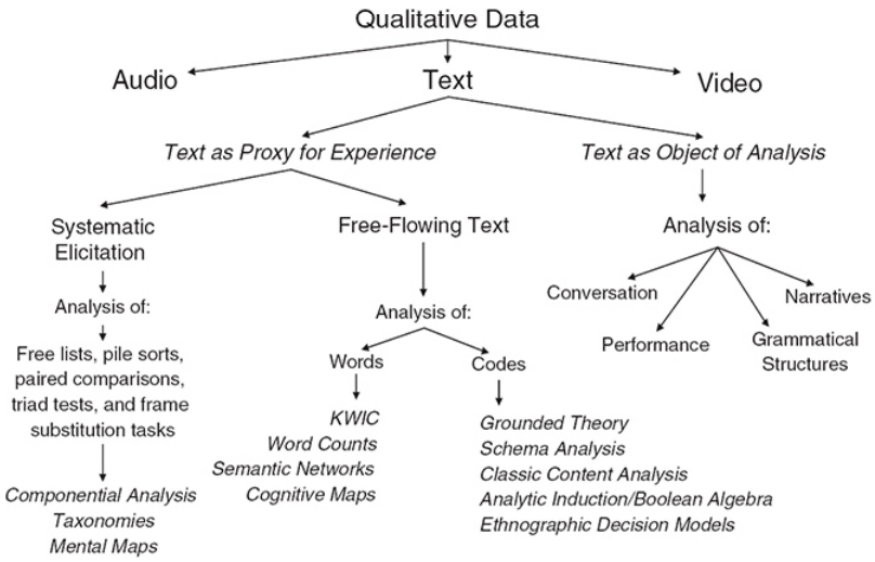

Figure 3.2: *The range of qualitative research (Bernard & Ryan, 1998).*

Word-based analyses, such as word counts or semantic network analysis, allow researchers to examine the frequency and co-occurrence of specific words or phrases within a text. This helps to identify key terms, recurring concepts, or patterns of word relationships throughout the data. However, code-based analysis moves beyond counting explicit words or phrases and focuses on identifying and describing both implicit and explicit ideas within the data (Guest et al., 2012). This approach was more suitable for this research considering the main research question. Code-based analysis, also referred to as open coding, can either be inductive or deductive (Schoch, 2019). In inductive coding, codes can emerge from the data, the information itself, or the people interviewed. In deductive coding, they are identified in advance of the data analysis. For this study, an inductive approach was used. According to the study of Schoch (2019), open coding is accompanied by axial coding in which relationships or connections are identified among the initial categories and themes that are identified during open coding. The combination of open coding and axial coding of qualitative data is also referred to as qualitative coding (Creswell, 2007). Qualitative coding was applied to the interview transcripts to identify cultural differences in digital dispute resolution practices. A very suitable research method to reveal participants' perceptions, feelings, and lived experiences that are paramount and are the object of study is phenomenology, even in smaller data sets (Guest et al., 2012; Smith et al., 2009). Phenomenological research is based on open-ended questions and conversational exploration, enabling participants to express their thoughts on a topic in their own words, without the limitations of fixed-response questions commonly used in quantitative research. At the same time, the researcher learns from participants' responses and adjusts the direction of the inquiry based on the insights gained during the conversation (Guest et al., 2012). Creswell (2007) suggests that there should be a minimum of five participants in a phenomenological study.

The phenomenological research sets the basis for the third phase of the data analysis: comparing. This final step in the case study data analysis included both in-case as well as cross-case comparisons. The in-case comparison was used to identify the different views of stakeholders in the selected cases. The cross-case comparison was executed to identify the differences in the impact of culture on dispute resolution practices. Combining the results of the in-case and cross-case analyses was used to identify how culture can shape digital dispute resolution practices.

3.4 Methods for validation

The interpretation of qualitative research by a single researcher can create a degree of bias that could impact the quality of the results (Marathe et al., 2017). It is therefore important to make the effort to eliminate this

bias to the greatest extent possible. Accordingly, two validity checks were conducted in the course of this research study. The initial validity check was conducted in accordance with the content analysis as described in the paper of Burnard (1991), which was identified in Stage 11 of the prescribed method. In this stage, the transcripts, findings, and relevant data associated with the analysed data are shared with the interview participants via email to reinforce the validity of the analysed data. The received responses are incorporated subsequently. The second validity check was done through an expert panel review. The primary aim of this research was to improve the dispute resolution process and to investigate how digitalisation can successfully be implemented in these practices. To this end, experts selected for this validation check were familiar with the construction industry in both England and the Netherlands. This approach enabled an evaluation of the viability of the findings and helped develop recommendations for practice.

3.5 Limitations

The research design as described in the previous sections present several limitations and drawbacks. The research methods used for data gathering and data analysis in this study are case studies, interviews, comparative analysis, qualitative coding, phenomenology, and validation. This section discusses each of these methods, their limitations and drawbacks, and what was done to mitigate them.

3.5.1 Case studies

In his study, Flyvbjerg (2006) discusses the misunderstanding that one cannot generalise on the basis of one case and that it can therefore not contribute to scientific development. While rejecting that case studies cannot be used to generalise information, the article emphasises the importance of carefully selecting case studies to ensure they contribute significantly to the advancement of scientific knowledge. This approach ensured the continued relevance of case studies, even in the context of unexpected or rare events, which are often referred to as 'black swans'.

3.5.2 Interviews

According to Blaxter et al. (2006), the interview method is a useful technique for collecting data as it offers researchers the opportunity to uncover information which would likely not be accessible using techniques such as questionnaires and observations. However, like any other research tool, interviews can be fraught with drawbacks (Alshenqeeti, 2014). One major issue is the potential for bias, both in how interviewees shape their responses based on what they believe the interviewer wants to hear, and in how interviewers may unconsciously influence responses or interpret them through their own preconceptions (Cohen et al., 2007; Hammersley & Gomm, 2008). Alshenqeeti (2014) comments on this that it seems that interviewees will only say what they are willing to say about their perceptions of events and opinions. However, these perceptions may be subjective and therefore change over time according to circumstances and may therefore be at a considerable distance from 'reality'. Interviews have also been criticised as time-consuming, both in terms of data collection and analysis, as they need to be transcribed, coded, and possibly translated (Robson, 2002). Another drawback is that qualitative interviews tend to generate large amounts of data, which can be overwhelming to some researchers when analysing the data (Neuman, 2014). This large volume of data can lead to difficulties in interpretation, especially since there is no universally fixed method for analysing interview data, which can affect the quality of the interview, as well as the validity and reliability of the whole research (Alshenqeeti, 2014; Creswell & Creswell, 2009).

Cohen et al. (2007) propose to minimise the factors which may lead to the possibility of bias such as the attitude, views, and prospects of the interviewer. Also, a tendency for the interviewer to see the interviewee on their own merits reduces the possibility for bias. Reliability, on the other hand, refers to the extent to which a research instrument yields the same results on repeated trials (Alshenqeeti, 2014). Brewerton and Millward (2001) justifiably argue that interviews can be notoriously unreliable due to their openness to so many types of bias, particularly when the researcher wishes to draw comparisons between data sets. In line with this, the study by Creswell and Creswell (2009) claims that interviewing reliability is 'elusive'. Researchers should follow techniques that would help maintain the validity and reliability of the interviews and the data retrieved from them. The techniques used for this research included avoiding leading questions,

taking notes, and giving the interviewee a chance to summarise and clarify points made (Alshenqeeti, 2014; Creswell & Creswell, 2009).

3.5.3 Comparative analysis

Cross-country comparisons can sometimes overlook the nuanced legal, cultural, or systemic differences between nations, leading to potentially oversimplified conclusions (Berríos, 2024; Boman, 2022). Another challenge is the problem of asymmetric understanding of the context of the selected cases, leading to imbalanced comparisons (Azarian, 2014). To address this, Azarian (2014) suggested that thorough background research and engagement with stakeholders in the selected cases should be undertaken to ensure a comprehensive understanding of each context.

3.5.4 Qualitative coding

The use of qualitative coding in this research faced several limitations. Firstly, a holistic understanding could be compromised, as the process of coding can fragment the data, potentially causing a loss of context and comprehensive insights (Linneberg & Korsgaard, 2019). To address this issue, it was essential to conduct a thorough review of the complete transcripts to guarantee that the coding accurately represents the context and situational factors (Linneberg & Korsgaard, 2019).

A second issue associated with qualitative coding is the potential for subjectivity, particularly given that coding decisions are largely based on the researcher's interpretation. Without multiple coders to check for inter-coder reliability, subjectivity could influence the results (Campbell et al., 2013). Another concern related to subjectivity was the potential impact on trustworthiness, as this research involved a single researcher. Involving multiple coders often enhances reliability through the comparison of different perspectives (Anderson et al., 2016). In this study, trustworthiness was maintained by employing reflexivity and continually reflecting on how personal biases may affect the analysis (Linneberg & Korsgaard, 2019).

Finally, there was the risk of seeing coding as a mechanical quick fix, leading to a de-contextualised interpretation of the data (Linneberg & Korsgaard, 2019). Coding should not replace the rich, detailed descriptions central to qualitative research. It was important to remain attentive to the data's context and avoid relying solely on the frequency of coded phenomena as a measure of significance (Bochner, 2017).

3.5.5 Phenomenological research

Guest et al. (2012) describe three limitations of phenomenological research as observed in the literature: it focuses only on human experience, it may interpret too far beyond what is in the data, and the research method is not necessarily systematic. The latter limitation was mitigated by making use of qualitative coding, combining inductive and axial coding, of the interview transcripts, enabling a more systematic approach of data analysis. The limitation of focusing data analysis exclusively on human experiences was mitigated by using data triangulation, as described in table 3.1. To avoid the researcher interpreted the data beyond what is present, it was important to maintain reflexivity throughout the research process. Reflexivity required the researcher to consistently reflect on their biases and role in interpreting the data, ensuring interpretations remain grounded in the participants' experiences, rather than the researcher's preconceptions.

3.5.6 Validation methods

The two methods that were used for validation of the findings of this study are theme content analysis, as described in Stage 11 by Burnard (1991), and the use of an expert panel, as discussed in section 3.4. The paper by McKim (2023) refers to the first validation method as 'member checking'. While this technique strengthens the validity of a study, member-checking transcripts has some weaknesses, such as limited feedback from participants, a lack of response, and that the reviewing of transcripts can be time-consuming for both participants and the researcher (Carlson, 2014; McKim, 2023; Stake, 1995). McKim (2023) proposed to structure the member-checking approach to eliminate this weaknesses, by presenting the participants with four structured questions to simplify the validation process, as given below.

1. After reading through the findings, what are your general thoughts?

2. How accurately do you feel the findings captured your thoughts/experiences?
3. What could be added to the findings to capture your experiences better?
4. If there is anything you would like removed, what would that be and why?

Drawbacks of using an expert panel for validation in this study consisted of two main components. The first one is related to the selection bias, as the individuals that were chosen might have shared similar viewpoints, limiting the diversity of insights (Peckham et al., 2022). The second component concerned the terminology of being an 'expert'. When is someone recognised as an expert in a certain field of interest? Both these issues were mitigated by selecting a panel that consisted of people that have sufficient professional knowledge about the construction industries' demeanour in both England and the Netherlands and have multiple years of working experience.

3.6 Data plan and ethical considerations

For a research study involving human participants, a data plan needs to be formulated and ethical considerations must be discussed.

3.6.1 Data plan

The TU Delft Research Data Framework Policy requires to deposit the research data, code and any other materials needed to reproduce research findings in a research data repository in accordance with the FAIR principles. In the study by Wilkinson et al. (2016) it is described that these requirements for the data need to be Findable, Accessible, Interoperable, and Reusable. The processing of the data in this thesis will be done in accordance with these principles in the following ways:

- **Findability:** the final thesis report will be publicly available to view and download for anyone via the TU Delft Education Repository.
- **Accessibility:** any supplementary data or information not included in the final report can be obtained by contacting the author via email. It is important to note that only data for which the author has full ownership can be shared with third parties. Any personally identifiable information obtained through the course of the interviews will not be disclosed without the explicit informed consent of the individual(s) involved. The information will either be omitted from the final thesis or, where possible, excluded entirely (such as full transcripts of the interviews).
- **Interoperability:** the thesis will be written in a formal, accessible, and widely applicable language, and a list of references will be provided.
- **Reusability:** the data presented in this thesis will adhere to the standards relevant to the field and will be contextualised in detail.

3.6.2 Ethical considerations

Bryman (2016) distinguishes four primary areas of ethical principles in social research:

1. Risk of of harm to participants
2. Informed consent from participants
3. Protection of their privacy
4. The involvement of deceptive practices

In order to safeguard the participants' wellbeing, guarantee the integrity of their informed consent, prevent any unwarranted invasion into their privacy, and ensure that they are not deceived in any way, the following measures have been taken. Prior to the start of the interview, it is essential to ensure that the interviewee was fully informed of the nature of the research, the manner in which it was going to be conducted, and the way the data retrieved from the interview would be processed. This will was done by informing them in

writing of the goal and process of the research by means of a informed consent form. Before the interview took place, the interviewee was asked to sign this form, confirming that they understood and agreed on the terms and conditions of the research. The interviews took place either in person or online. In both cases,the interviews took place in a safe setting and offered enough privacy for the interviewee to feel comfortable speaking freely. Any names or organisations mentioned in the interview were censored, in order to protect their privacy.

3.7 Research output

The primary goal of this research is to create value for the building industry by providing insight in how to improve the dispute resolution process in small-scale projects using digital technologies. The deliverables of this research are as follows:

1. A literature review of the relevant aspects of culture influencing digital dispute resolution practices.
2. An in- and cross-case analysis of how digitalisation is used in dispute resolution in small-scale construction projects.
3. Insight in how culture can shape digital dispute resolution practices.
4. Advice on how to successfully implement digital technologies in dispute resolution based on cultural preferences.

The output of this research is relevant to two different groups. The first group is the academics studying the relationship between social and human aspects and the successful implementation of digitalisation in the construction industry. They are provided with new insights and incentives for further research. The second group is the professionals within the construction industry and practitioners. They are provided practical recommendations on how to successfully implement digital technologies to improve the dispute resolution process. By applying this advice, the resolution process will run more smoothly over time and the elements of effective dispute resolution will be reinforced.

4. Literature review

This chapter presents the literature review of this study, which serves to establish a foundation for understanding the main variables identified in the research question: culture and digital dispute resolution. First, the concept of culture is discussed. Next, the other aspects relevant to this study that connect culture with digital dispute resolution practices are described. The chapter will conclude with the formulation of a conceptual framework, which will serve as the basis for the setup of the empirical research.

4.1 Culture

The first variable in the main research question is culture. The concept of culture can be approached from a large variety of perspectives, resulting in numerous different definitions and interpretations of both the term and the phenomenon itself (Ankrah & Langford, 2005; Dan, 2020). Hofstede (1984) provided a generally acknowledged definition of culture: 'the collective programming of the mind that distinguishes the members of one human group from another.' (p. 21) To be able to say anything about culture in relation to the design of digital dispute resolution practices, a working definition for culture in the construction industry is needed. Ankrah and Proverbs (2004) define culture in the building industry as 'what is carried out, how and when it is done, who is involved and why things are done the way they are.' (p. 554) In order to ascertain the influence of culture on digital dispute resolution practices, it is essential to consider the behaviour of the actors and organisations involved. Researchers agree that culture operates on multiple levels (Dan, 2020). However, there is no consensus on which levels these are and on the nature of the interaction between these levels (Dan, 2020). As a result, a variety of models have been developed to visualise the phenomenon of culture (Dan, 2020). In the following subsections, different models on culture are discussed, and a conclusion is given on what is understood by culture in this research and how it is broken down.

4.1.1 The institutional theory

A theory that is frequently used in the literature to explain social behaviour is the institutional theory by Scott (2014). Institutions are the collection of multifaceted, durable social structures, made up of symbolic elements, social activities, and material resources, which all influence the behaviour of organisations and individuals (Scott, 2014). Richard Scott is a prominent sociologist who has contributed significantly to the development of this theory. The institutional theory is built on three pillars: the regulative system, the normative system, and the cultural-cognitive system. These elements have been identified by one or another theorist as the central building blocks of institutions (Scott, 2014). Consider table 4.1. The columns in the table represent the three pillars of institutions. The rows define some of the principal dimensions. The table serves as a guide for the rest of this section.

The regulative pillar

The regulative pillar of the institutional theory is concerned with the formal and informal mechanisms that create order and compliance within a system (Scott, 2014). It includes rules, laws, regulations and associated enforcement mechanisms that constrain and guide behaviour and ensure that individuals and organisations act in accordance with established norms and expectations. These mechanisms form the structural backbone of institutions and provide a framework for predictability and control within social

Table 4.1: *The three pillars of institutions (Scott, 2014).*

	Regulative	**Normative**	**Cultural-Cognitive**
Basis of compliance	Expedience	Social obligation	Taken-for-grantedness, Shared understanding
Basis of order	Regulative rules	Binding expectations	Constitutive schema
Mechanisms	Coercive	Normative	Mimetic
Logic	Instrumentality	Appropriateness	Orthodoxy
Indicators	Rules, Laws, Sanctions	Certification, Accreditation	Common beliefs, Shared logics of action, Isomorphism
Affect	Fear, Guilt/Innocence	Shame/Honour	Certainty/Confusion
Basis of legitimacy	Legally sanctioned	Morally governed	Comprehensible, Recognisable, Culturally supported

and organisational contexts. The formal rules in this pillar can take various forms, such as legal codes, national policies and formal contracts that outline permissible and prohibited actions. Enforcement of these rules is achieved through both coercion and incentives (Scott, 2014). Coercion, as employed by Scott (2014) has used the concept as described by DiMaggio and Powell (1983). Coercive mechanisms, such as fines and penalties, ensure compliance by deterring violations and are the primary mechanism of control involved in this pillar. (Scott, 2014). Conversely, incentives, such as tax breaks or subsidies, encourage compliance (Scott, 2014). This dual mechanism promotes both deterrence and compliance with institutional expectations. Moreover, the legitimacy of this coercive and incentive system often promotes internalisation, whereby individuals come to see compliance not only as desirable, but also as necessary and appropriate (Scott, 2014). Legitimacy reinforces the stability and authority of the regulatory framework. The regulative pillar influences human behaviour by placing actions in a context of formal expectations and consequences. Individuals and organisations operate within these constraints and make decisions based on the trade-off between the rewards of compliance and the sanctions of non-compliance (Scott, 2014). This reflects the instrumental logic underlying the regulative pillar. Instrumental logic posits that the behaviour of individuals and organisations reflects a rational choice approach.

The regulative pillar influences human behaviour by placing actions in a context of formal expectations and consequences. Individuals and organisations operate within these constraints and make decisions based on the trade-off between the rewards of compliance and the sanctions of non-compliance. This reflects the instrumental logic underlying the regulative pillar. Instrumental logic means that the behaviour of individuals and organisations reflects a rational choice approach (Scott, 2014). That is, actions are taken based on calculated assessments of risks and benefits, rather than intrinsic motivation or normative obligation, and are therefore predictable. However, Scott (2014) emphasises that this instrumental behaviour also interacts with other institutional dimensions, such as the normative and cultural-cognitive pillars, highlighting the complexity of institutional influences on behaviour.

The regulative pillar is an important part of institutional theory, shaping behaviour through formalised structures and enforcement mechanisms. It provides the basis for predictability, order and compliance that allow institutions to function effectively. By understanding the regulative pillar, it is possible to better analyse how formal rules and enforcement practices influence behaviour. This is an important factor in this study, as regulatory frameworks play a critical role in shaping organisational practices, and therefore the design and use of digital dispute resolution in construction.

The normative pillar

The normative pillar is the second central component of institutional theory and focuses on the values and norms that define what is considered appropriate behaviour within a social context (Scott, 2014). Values represent conceptions of what is desirable within a society by telling people what is right or wrong. They define the overarching goals or objectives that individuals and organisations seek to achieve, such as fairness,

efficiency or profitability (Scott, 2014). Norms provide the specific guidelines or standards of behaviour necessary to realise these values. They prescribe the legitimate means to pursue valued goals and the appropriate ways to pursue them (Scott, 2014). Normative systems define the roles that individuals or organisations occupy within a social structure. In other words, they tell people what is acceptable or not. The roles of normative systems include expectations of behaviour, goals and responsibilities (Scott, 2014). Roles can be formally constructed, such as positions defined in an organisational hierarchy, or informally developed through social interactions over time (Blau & Scott, 2004; Scott, 2014). They guide behaviour by outlining appropriate behaviour and social obligations. This social obligation is the starting point of the normative pillar and means that behaviour is not motivated by coercion, as in the regulative pillar, but by a shared sense of responsibility and appropriateness (Scott, 2014). Adherence to norms is often reinforced by external pressures and internalised values that align individual actions with collective expectations (Scott, 2014). This creates shared norms and expectations and shapes how individuals and organisations should behave and act based on moral perceptions of legitimacy. Scott (2014) describes how, in this way, the system influences other emotions than those of the regulative pillar. In the regulative pillar, the system influences fear, guilt and anxiety or, on the other hand, relief, innocence and justification. In the normative pillar, adherence to norms over time gives a sense of legitimacy, honour and respect, while violation can lead to feelings of shame or dishonour.

Although norms impose constraints by defining acceptable behaviour, they also empower individuals and enable social action by providing roles, privileges and responsibilities (Scott, 2014). These roles, such as the client, contractor or mediator, guide individuals not only in their actions, but also in their interactions with others, as their behaviour is judged against shared norms and standards. This internalisation of norms often leads individuals to comply voluntarily, without the need for external enforcement, and stabilises and increases the predictability of the system (Scott, 2014).

The normative pillar is a central component of institutional theory, shaping behaviour through shared values, norms, and socially defined roles. It emphasises moral governance and social obligations, and promotes alignment between individual actions and collective expectations. By understanding the normative pillar, this research can explore how values and norms influence organisational practices and stakeholder behaviour, particularly in relation to the design and implementation of digital dispute resolution tools in construction.

The cultural-cognitive pillar

The cultural-cognitive pillar represents the third dimension of institutional theory, focusing on the shared beliefs, assumptions, and mental frameworks that shape how individuals perceive and act within their environments. The cultural-cognitive pillar is rooted in the taken-for-granted understandings that underlie shared reality, and thus constitutes the deepest level of institutional theory (Scott, 2014). It emphasises how institutions influence human behaviour through collective mental schemas and interpretive frameworks. Shared understanding forms the basis of these schemas and frameworks, which reflect deeply held beliefs and assumptions that shape how individuals and organisations interpret the world and often determine whether something is perceived as legitimate or appropriate. A mechanism through which the cultural-cognitive pillar manifests itself is mimicry (Scott, 2014). A mimetic mechanism occurs when individuals and organisations unconsciously adopt practices that fit within the prevailing cultural framework. This imitation promotes stability by reinforcing shared norms and practices, allowing institutions to adapt and maintain coherence even in changing circumstances. The guiding logic of this pillar is one of orthodoxy, whereby actions are guided by what is considered natural or self-evident within a given context. The actions themselves are expressed through shared beliefs and isomorphic practices (Scott, 2014). In addition, legitimacy is created because actions and decisions that align with shared understandings are seen as rational and appropriate, while those that deviate from them may be met with confusion or resistance. This pillar thus influences behaviour not through explicit enforcement or moral obligations, but by aligning actions with collectively understood meanings and assumptions. As a result, individuals and organisations are more likely to adhere to established practices and norms, ensuring continuity and coherence in their behaviour (Scott, 2014).

The cultural-cognitive pillar is a fundamental element of the institutional theory, focusing on shared beliefs, assumptions, and interpretive frameworks that shape how individuals and organisations perceive and act

within their environments. It provides the foundation for understanding how collective mental models and taken-for-granted assumptions are interpreted and influence behaviour and decision-making. By examining the cultural-cognitive pillar, this research can explore how shared understandings and cognitive frameworks impact organisational practices and stakeholder behaviour. This is particularly important for understanding how digital dispute resolution tools can be designed and implemented effectively in the construction sector, taking into account the underlying contexts of this pillar and how this plays out across different stakeholders.

The three pillars and institutional change

In his book, Scott emphasises that in the majority of empirically observed institutional forms, no single element is at work, but rather a varying combination of elements. In stable social systems, practices that persist and are reinforced are observed because they are taken for granted, normatively endorsed, and backed by authorised powers. When the pillars are aligned, the strength of their combined forces can be significant (Scott, 2014). This power is reflected in the interplay of the effects of the different pillars on different cultural levels.

However, in many situations the three pillars are not equally supportive, but rather one or another is privileged (Scott, 2014). Furthermore, the pillars may not be aligned, thereby supporting and motivating different choices and behaviours. When the three pillars are not well aligned, they can provide resources that different actors use for different purposes (Scott, 2014). This can result in confusion and conflict within and between cultural levels, which may in turn lead to institutional change (Kraatz & Block, 2008; Scott, 2014).

Palthe (2014) formulated a framework to explain institutional change, see figure 4.1. The model demonstrates how institutional elements influence organisational change through internal dissatisfaction with existing operational methods. It suggests that the extent to which this dissatisfaction drives change is determined by the organisation's capacity for change and the degree of resistance to change, and how these three components are products of the institutional model, composed of the three institutional pillars described by Scott (2014). Dissatisfaction, change capacity, and change resistance are organisation-dependent and can be used to indicate potential cultural differences (Palthe, 2014).

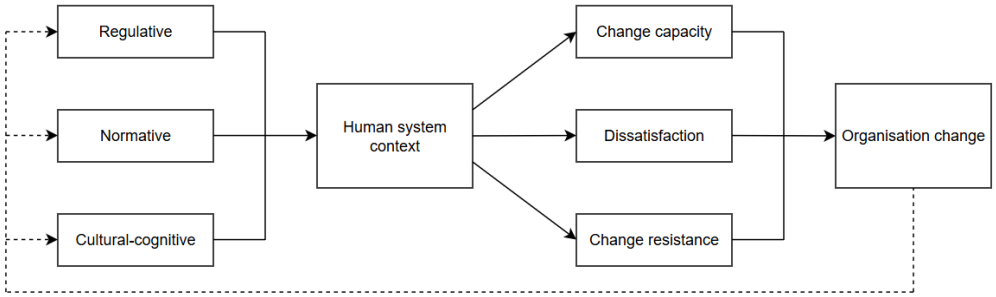

Figure 4.1: *Conceptual model of the influence of regulative, normative, and cognitive elements on organisational change (Palthe, 2014).*

4.1.2 Hofstede's cultural dimensions theory

The social psychologist Geert Hofstede developed a model on 'mental programming', in which culture is positioned in between 'human nature' and 'personality', depicted in figure 4.2. Hofstede et al. (2010) posit that human nature is defined by the common characteristics that all individuals share, namely the genetic elements that determine general physical functionality. Personality, on the other hand, is considered distinct and multifaceted, with unique aspects contributing to individuality. Culture is described as a specific attribute of a given group or category of people, consisting of elements that are learned throughout life (Hofstede et al., 2010).

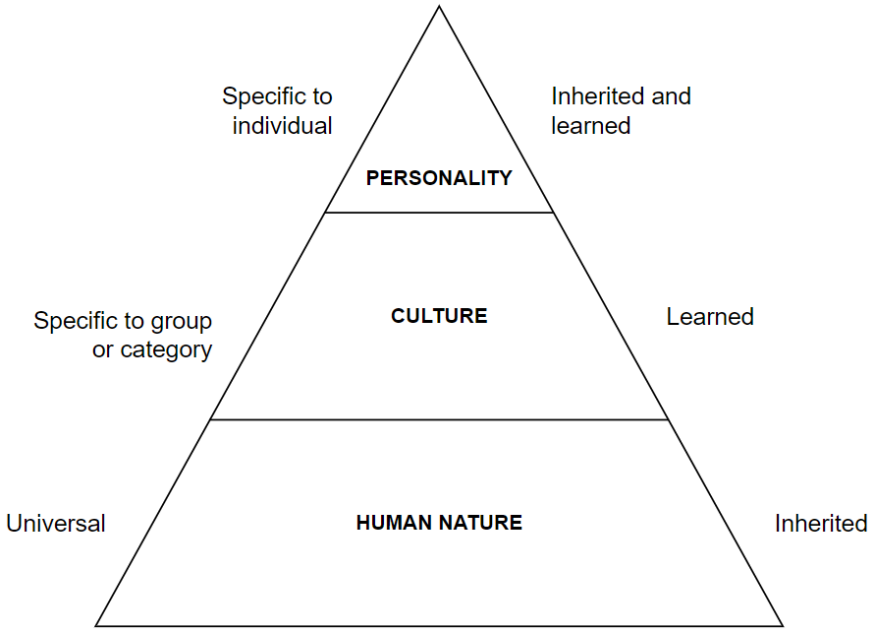

Figure 4.2: *Thee levels of uniqueness in mental programming (Hofstede et al., 2010).*

Hofstede's cultural dimensions theory was developed to understand cross-cultural differences in behaviour within organisations and national contexts (Żemojtel-Piotrowska & Piotrowski, 2023). The cultural dimensions are an attempt to provide a basis for analysing these cross-cultural differences (Żemojtel-Piotrowska & Piotrowski, 2023). Initially, the theory proposed only four dimensions, namely power distance, individualism versus collectivism, masculinity versus femininity, and uncertainty avoidance (Hofstede, 1980). This model was later reformulated and supplemented, resulting in the final model consisting of six dimensions, now including long-term versus short-term orientation and indulgence versus restraint (Hofstede, 2011). Table 4.2 briefly elaborates what each dimension entails.

Table 4.2: *Cultural dimensions and their content, based on Hofstede (2011).*

Cultural dimension	**Content**
Power distance	Refers to how individuals relate to those of higher or lower rank and the extent to which less powerful members of a society, organisation or institution accept an unequal distribution of power.
Individualism versus collectivism	Describes the strength of the integration of individuals into primary groups.
Femininity versus masculinity	Examines the division of emotional roles between women and men and the values they hold.
Uncertainty avoidance	Concerns the level of stress in a society when faced with unstructured, novel or unpredictable situations.
Long-term versus short-term orientation	Reflects how societies approach time and change, focusing either on the future or on the present and past.
Indulgence versus restraint	Assesses the extent to which societies allow basic human needs to be freely satisfied.

Though Hofstede's cultural dimensions theory gained high traction, it also received serious criticism, mainly because of methodological concerns (Minkov & Kaasa, 2022; Żemojtel-Piotrowska & Piotrowski, 2023). These critical points can be summarised by poor face validity, too high correlation between dimensions, and

biased samples with over-representation of men originating from a specific company (Żemojtel-Piotrowska & Piotrowski, 2023).

Figure 4.2 shows the three levels of uniqueness in mental programming, namely universal, specific to a group or category, and specific to an individual. Hofstede et al. (2010) describes how the second level of this model, specific to a group or category, is related to culture. In section 4.1.1, it was discussed that multi-level research is a promising avenue within the framework of institutional theory. The following section elaborates on what is understood by these levels and what each level entails.

4.1.3 The cultural levels and layers

Many studies, including Dan (2020) and Leung et al. (2005), underline the existence of multiple levels as well as multiple layers of culture. The multi-level approach views culture as a hierarchical construct that consists of various levels nested within each other, from the most macro-level to the most micro-level (Dan, 2020; Leung et al., 2005). Gannon (1994) found that the macro-level is rooted most deeply, and that changes at that level occur very gradually over time. Figure 4.3 shows the multi-level model of culture as proposed by Erez and Gati (2004), taking into account the interplay between different levels. Their model has five levels, with the individual culture representing the micro-level, and the global culture the macro-level. The dynamic characteristic of culture is represented by two processes: top-down and bottom-up. The global culture influences the behaviour of individuals from different cultures through top-down processes. Conversely, changes in the behaviour of individuals will result in corresponding changes in norms and values, which become accepted at the macro-level (Erez & Gati, 2004).

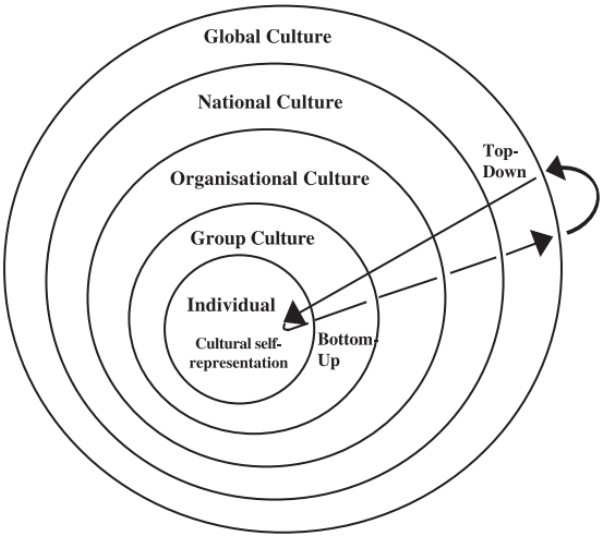

Figure 4.3: *The dynamic of top-down–bottom-up processes across levels of culture (Erez & Gati, 2004).*

Another model representing the multi-level approach of culture is developed by Karahanna et al. (2005), see figure 4.4. The paper describes that the various levels of culture are both hierarchically and laterally related, meaning that each level is nested within broader cultural systems and that the layers can overlap or intersect without adhering to a top-down or bottom-up process, as proposed by Erez and Gati (2004). The paper also emphasises that the ellipse labelled *Individual* does not represent another layer of culture, but rather shows how the culture of an individual is the product of the other layers. In table 4.3, an overview is presented of the different cultural levels as defined by Erez and Gati (2004) and Karahanna et al. (2005). These levels represent the groups or categories within the level *culture* of Hofstede's model of mental programming, see figure 4.2. Note that this level of mental programming is not to be confused with the cultural levels.

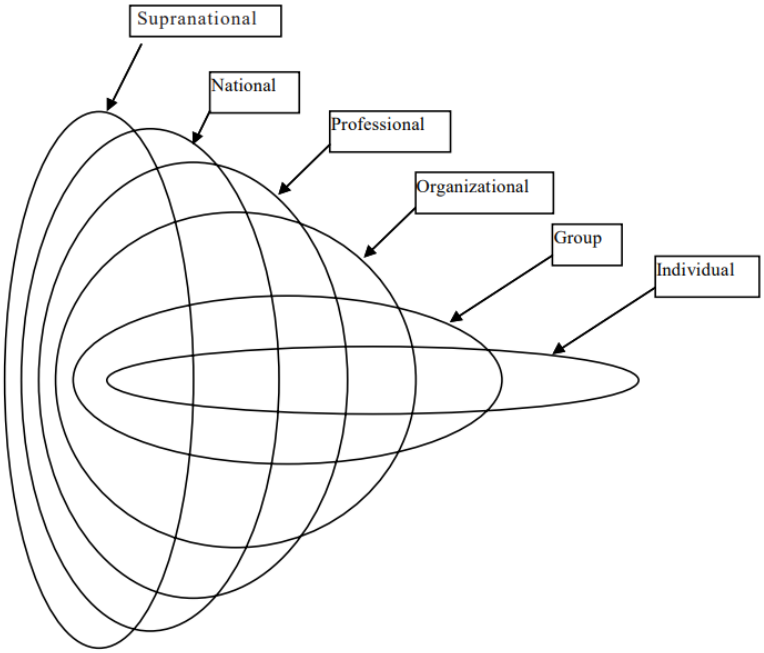

Figure 4.4: *Interrelated levels of culture (Karahanna et al., 2005).*

Table 4.3: *The cultural levels, based on Erez and Gati (2004) and Karahanna et al. (2005).*

Cultural Level	Erez and Gati (2004)	Karahanna et al. (2005)
Individual	Reflects the cultural values as they are represented in the self (Erez & Gati, 2004).	
Group	Shared values and norms among team members within an organisation. This level emphasises shared learning orientation, psychological safety, trust, and support (Edmondson, 2002).	Cultural differences that are contained within a single group, workgroup, or other collection of individuals at a level less than that of the organisation (Karahanna et al., 2005).
Organisational	A set of shared beliefs and values within an organisation that shape its members' behaviours. It reflects innovation, risk-taking, and team orientation (O'Reilly et al., 1991).	The social and normative glue that holds organisations together (Siehl & Martin, 1990).
Professional		Focus on the distinction between loyalty to the employing organisation versus loyalty to the industry (Karahanna et al., 2005).
National	The shared values and norms within a nation-state (Hofstede, 1980).	Collective properties that are ascribed to citizens of countries (Hofstede, 1984).

Cultural Level	Erez and Gati (2004)	Karahanna et al. (2005)
Supranational		Any cultural differences that cross national boundaries or can be seen to exist in more than one nation. Can consist of: Regional – Pertaining to a group of people living in the same geographic area; Ethnic – Pertaining to a group of people sharing common and distinctive characteristics; Religious – Pertaining to a group of people with the same religion; Linguistic – Pertaining to a group of people speaking the same tongue (Karahanna et al., 2005).
Global	Represents shared global values such as freedom of choice, free markets, individualism, innovation, tolerance of diversity, and interdependence (Erez & Gati, 2004).	

Though researchers have different ideas on the structure of the cultural levels, they do recognise that each level exists of multiple elements. These are the cultural layers, which refer to 'the degree to which the cultural phenomenon is visible to the observer' (Schein, 2010, p. 23). In his book, Schein (2010) describes how any cultural level consists of three layers. The most external layer is the most visible part of culture and addresses observed artifacts and behaviours. The middle layer consists of beliefs and values, which include ideals, goals, values, aspirations, ideologies, and rationalisations. The deepest level is the one of basic assumptions, which are invisible and taken for granted.

Another model which recognises the multiple layers characteristic of culture is the one proposed by Hofstede (2001), see figure 4.5. The model illustrates how culture manifests at varying depths. The outermost layer consists of symbols, such as words, gestures, pictures, or objects. Symbols are the most superficial manifestations of culture and carry a particular meaning that is recognised by people sharing the same culture. The next layer comprises heroes, who are individuals that are highly valued within a culture for their characteristics and serve as role models. Surrounding the core, rituals represent collective activities that serve no immediate practical purpose but are socially essential within the cultural context. Rituals include religious or social ceremonies and behaviours such as the ways people greet each other. At the core of the onion diagram are values, the deepest layer of culture. Values represent fundamental distinctions such as good versus bad. These deeply embedded values shape people's behaviours and underpin the entire cultural structure. In the diagram, a diagonal element that crosses all layers of culture is added. This diagonal represents the practices. Practices encompass the visible aspects of symbols, heroes, and rituals but their underlying meaning can only be fully understood by those who share the culture (Hofstede, 2001).

4.1.4 Conclusions on culture

In this study, the definition of culture formulated by Ankrah and Proverbs (2004) is followed, which described culture in the building industry as 'what is carried out, how and when it is done, who is involved and why things are done the way they are.' (p. 554) The different models discussed in this section all aim to explain human behaviour, to explain the 'why things are done the way they are'.

The institutional theory developed by Scott (2014) shows how social behaviour can be explained based on the three pillars: the regulative system, the normative system, and the cultural-cognitive system. The institutional theory is very useful to understand how culture shapes practices and fosters institutional change.

The three cultural layers described by Schein (2010) and the layers of the onion diagram proposed by Hofstede (2001) show a significant overlap with the three pillars of the institutional theory described in section 4.1.1. The onion diagram, depicted in figure 4.5, shows, and the paper by Karahanna et al. (2005)

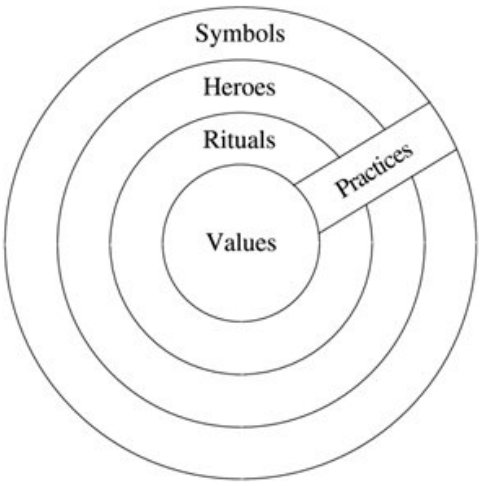

Figure 4.5: *The 'Onion Diagram': Manifestations of Culture at Different Levels of Depth (Hofstede, 2001).*

discusses that all cultural levels affect practices. Various studies recognise that each cultural level consists of cultural layers (Dan, 2020; Hofstede, 2001; Leung et al., 2005; Schein, 2010).

According to Hofstede's model of mental programming, culture is specific to a group or category. In section 4.1.3, two theories on cultural levels were discussed. These levels represented different groups or categories who have their own culture. Table 4.3 presents an overview of these cultural levels. Given the focus of the main research question of this study, this research will focus on the national, organisational, and role-specific culture. The national culture provides the context within which organisations in the construction industry operate. It shapes the foundational beliefs, values, and behaviours of individuals based on their country of origin. This is of particular significance in this research as it has the potential to influence how stakeholders approach formal contracts, resolution of disputes, decision-making, and the use of digital tools. The organisational culture refers to the shared norms, values, and practices within the context of a particular company. The manner in which companies approach collaboration, hierarchy, communication, and problem-solving may vary, which in turn affects how stakeholders interact and align during the project. In addition, the organisational culture explains the company's working style and expectations, which are crucial to understanding project dynamics and implementation of digitalisation. As Hofstede's cultural dimensions theory was developed to understand cross-cultural differences in behaviour within organisations and national contexts, it can be used to provide insight into the behaviour of these cultural levels (Żemojtel-Piotrowska & Piotrowski, 2023). The role-specific culture is derived from the professional and group cultures (see table 4.3) and encompasses the shared norms and expectations associated with the professional identity or role within a project. To illustrate, clients, project managers, and contractors may have distinct professional priorities, for example cost control, project delivery, or quality assurance, that influence their behaviour and decisions. Studying the role-specific culture enables to contextualise how professional responsibilities and identities influence perceptions of digital tools and dispute resolution methods. Figure 4.6 shows the interconnectedness of these three cultural levels. The following sections present an analysis of the variables that influence the behaviour of these different levels.

Figure 4.6: *The three levels of culture studied in this research.*

4.2 Contract law within the legal system

As described in section 4.1.1, the regulative pillar of the institutional theory exerts control through regulations and the enforcement of compliance, forming the backbone of institutions. It encompasses formal rules, laws, and sanctions that guide and constrain behaviour. Contracts specify obligations and responsibilities of an agreement as well as sanctions for non-compliance of those obligations and responsibilities. Contracts are governed by formal rules and laws that reflect the legal system in which they exist. In the following sections, it is discussed how formal contracts are formed within a legal system. First, the functional analysis of the contract is explained. Next, the Dutch and English legal systems are described, and how construction contracts fit in. The section concludes with highlighting how the legal system and its formal rules shape behaviour within the building industry.

4.2.1 Functional analysis of contracts

The paper by Maluccio and Marlow (1974) discusses how a contract is the basic framework for a substantial part of legal practice and that, for this reason, the legal profession has attempted to define the term. According to Maluccio and Marlow (1974), the diversity of elements and perspectives inherent in the concept has prevented the development of a fully satisfactory or universally accepted legal definition. However, one definition that has been widely quoted is the following: 'A contract is a promise, or set of promises, for breach of which the law gives a remedy, or the performance of which the law in some way recognises a duty.' (American Law Institute, 1981, §1). This definition for contracts applies to all forms of contractual agreements, including purchase agreements, contracts of insurance, and construction contracts (Chao-Duivis et al., 2018). Hereinafter, all references to contracts shall relate to construction contracts, unless indicated differently.

Contracts have become more complex to address uncertainties in construction projects, with clauses designed to handle all possible contingencies during the construction phase (Cheung, 2014). The functions of contract clauses can be analysed through concentric circles, as depicted in figure 4.7, where the inner circle represents the core obligations of the contracting parties. In their book, Schlesinger et al. (1968) study the foundational principles and differences in contract formation across various legal systems, identifying both shared elements and divergences in how contracts are initiated and agreed upon within different jurisdictions. He found that the 'common core', depicted as the inner circle in figure 4.7, of the conditions for the formation of a valid contract established by a given legal system, is likely to be of particular importance in practice. Cheung (2014) describe that changes are considered necessary and inevitable in all construction projects, and thus provisions for variations, acceleration, and postponement should be included, along with corresponding adjustments in time and money. This is represented by the adjustment layer surrounding the core. The

dotted line reflects the adjustment characteristic of this layer. The third layer focuses on verification and approval of the completion of the obligations as stated in the contract. Scheduling performance in completing projects and fulfilling obligations is of importance and various measures, including monitoring, inspection, testing, surety, and insurance, are used to control and facilitate project completion. Certificates serve as indicators of successful completion of obligations by contractors. The outer layer of figure 4.7 deals with available remedies in case of non-performance of the obligations. Contracts list the circumstances under which parties can terminate the agreement and outline their respective rights and obligations. However, disputes often arise regarding the interpretation of performance requirements and dispute resolution clauses are included to address such conflicts (Cheung, 2014). Cheung (2014) also mentions that it is important to note that dispute resolution methods are not stand-alone provisions, but are closely connected to the operation of the preceding layers.

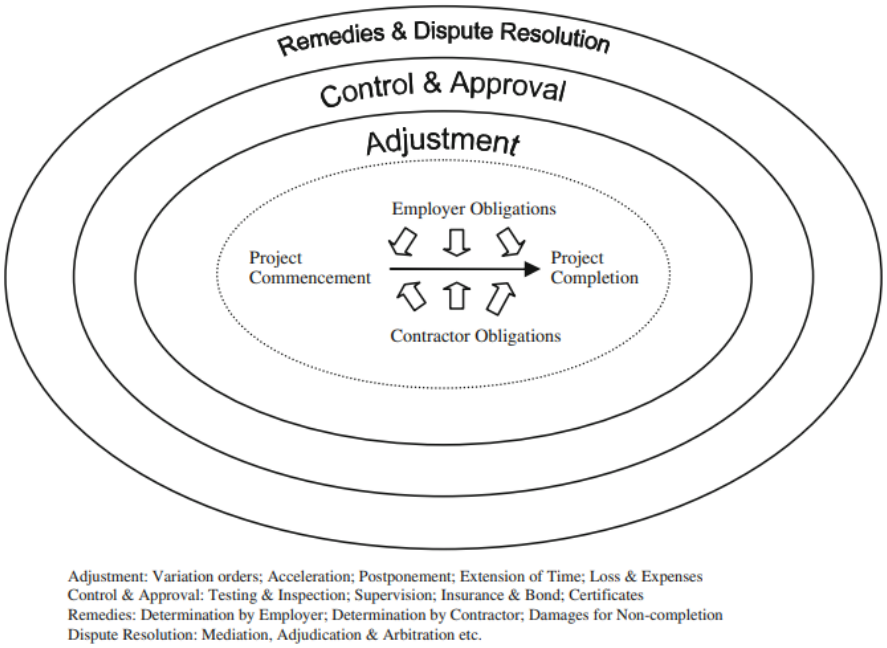

Figure 4.7: *Functional analysis of construction contracts clauses (Cheung, 2014).*

The proposition put forth by Cheung (2014), concerning the correlation between the dispute resolution methods with the inner layers, is in alignment with the findings presented by Schlesinger et al. (1968), who posit that the common core is of particular importance in practice. This is supported by the report of RICS (2024), which describes that the selection of an appropriate construction contract results from the choice of the procurement route, which, in turn, is selected based on the projects' characteristics. Furthermore, the procurement route defines the obligations of the employer and the contractor, constituting a fundamental aspect of the inner circle, as illustrated in figure 4.7. Important factors that are considered when selecting the procurement route are the types of works required, the sector of the works, size, value, and the complexity of the project (RICS, 2024).

This study is focused on small-scale construction projects. Although the term 'small building works' is commonly used throughout the construction industry, one of the first points to emerge from the study by Griffith and Headley (1995) was the considerable variation in conceptual awareness and understanding of small works. Nevertheless, Griffith and Headley (1995) succeeded in identifying eight characteristics of small works that distinguish them from other types of construction work. These include the limited cost, low complexity, short duration, limited inputs, harbouring uncertainty, utilising limited formal documentation, considerable diversity in basic characteristics, and occurring in active environments.

With the function of contracts clear, the following sections will discuss both the Dutch and English legal systems, and how contract law is constructed.

4.2.2 The Dutch legal system

The Dutch law is based on the civil law, which has its origin in Roman law (Pejovic, 2001). The main feature of civil law is that it is contained in civil codes, which are described as a 'systematic, authoritative, and guiding statute of broad coverage, breathing the spirit of reform and marking a new start in the legal life of an entire nation' (Schlesinger et al., 1988, p. 271). Important to note is that the civil codes of countries have some important differences (Pejovic, 2001). Although the civil codes of different countries are not homogeneous, there are certain features of all civil codes which unite them, which distinguish them from those who practise under different systems (Schlesinger et al., 1988).

Dutch contract law is primarily governed by the Dutch Civil Code (DCC) (Chao-Duivis et al., 2018). In the DCC, the definition of a contract reads as 'an agreement in the meaning of this Title is a multilateral juridical act whereby one or more parties enter into an obligation towards one or more parties' (DCC, 2024, Article 6:213(1)). A juridical act is characterised by the fact that the parties acting intend it to have legal consequences. In other words, it is potentially enforceable by law. An agreement is a multilateral juridical act because more than one party is required to agree for it to come into being (Chao-Duivis et al., 2018).

Civil law is largely classified and structured and contains a large number of general rules and principles, often lacking in detail (Pejovic, 2001). One of the basic characteristics of civil law is that the main task of the courts is to apply and interpret the law contained in a code or statute to the facts of a case (Pejovic, 2001). This is also known as the Haviltex criterion, which means that the interpretation of a written contract is not decided based only the linguistic meaning of the words in which it has been put (Pretorius, 2004). The Haviltex criterion is context-sensitive, allowing for varying emphasis on the contract's text based on the specific case. This flexibility reflects the principle that parties are bound by their intentions, even if the text of the contract inadequately expresses these intentions (Pretorius, 2004; Wissink, 2020). However, the Dutch Supreme Court observes that the linguistic meaning of the words, when understood in the context of the entire document and societal norms, often holds significant relevance (Wissink, 2020). The court, therefore, seeks a balance between 'certainty' and 'flexibility', representing textual clarity and contextual understanding respectively, in contract interpretation, acknowledging the diversity of cases (Wissink, 2020).

The assumption in civil law is that the code regulates all cases that may arise in practice, and if certain cases are not regulated by the code, the courts should apply some of the general principles that are used to fill the gaps (Pejovic, 2001). One of these principles is the Haviltex criterion. Another principle is the one of good faith, also known as reasonableness and fairness (Dudok van Heel & Tjittes, 2022; Pejovic, 2001). Under Dutch law, reasonableness and fairness are the basic standard of all contract law (Dudok van Heel & Tjittes, 2022). This principle is codified in Book 6 of the DCC, where it is established as a standard of conduct (DCC, 2024, Article 6:2(1)). Reasonableness and fairness are granted the authority both to supplement contractual agreements and to limit their effects (DCC, 2024, Article 6:248). The papers by Dudok van Heel and Tjittes (2022) and Pretorius (2004) discuss whether it is justified that the Dutch law is sometimes said to be dominated by the somewhat vague concept of good faith, which would result in a reduction in certainty. However, the significance of good faith and the Haviltex criterion in this context is such that it is inappropriate to assume that rulings are merely the consequence of a subjective agreement, which a court is required to ascertain through interpretation (Dudok van Heel & Tjittes, 2022; Pretorius, 2004). As with other legal systems, Dutch law is designed to guarantee certainty and objectivity.

Dutch contract law consist of three principles, all based on reasonableness and fairness (Chao-Duivis et al., 2018). These three principles are freedom of contract, the binding force of agreements, and no prescribed form (Chao-Duivis et al., 2018). The concept of freedom of contract means that parties are in principle free to enter into any agreement they wish with anyone they wish, irrespective of whether or not the law lays down rules regarding such an agreement (Chao-Duivis et al., 2018). This, however, does not mean that anything can lawfully go into contract. The qualification 'in principle' limits the concept of freedom of contract. In the event that an agreement is deemed to be incompatible with public morals or public order, or contravenes statutory provisions of coercive law, meaning that it can not be waived, it shall be considered null and void, or voidable. Nullity means that the act does not exist or that it is not enforceable as a juridical act and thus has no legal force under contract law (Chao-Duivis et al., 2018).

The second principle is the binding force of agreements. This principle means that the parties are in principle obliged to carry out their promises and adhere to the terms of their agreement (Chao-Duivis et al.,

2018). Again, this principle is limited. In extreme cases the law allows the contract to be set aside either as a whole or in part (Chao-Duivis et al., 2018). In certain circumstances, the application of a contractual rule or a rule based on the law itself, which is valid in a relationship between two parties, may be deemed unacceptable in terms of reasonableness and fairness (DCC, 2024, Article 6:248(2)). This is referred to as the restrictive effect, or the derogation effect, of reasonableness and fairness, whereby the effect of the contract can be restricted (Chao-Duivis et al., 2018). Nevertheless, this occurs exclusively in situations where it would be unacceptable not to strike out the rule, objectively speaking (Chao-Duivis et al., 2018). In addition to the restrictive effect of reasonableness and fairness, there is a supplementary effect of reasonableness and fairness. It is not feasible to codify all details in a written document, which reflects one of the characteristics of civil law (Chao-Duivis et al., 2018; Pejovic, 2001). In some cases, a matter may be understood as self-evident by the parties involved and therefore not explicitly documented in writing. Nevertheless, one of the parties is bound by this obligation as a result of the supplementary effect of reasonableness and fairness. It is not possible for this party to subsequently argue before a court that they are not bound by the obligation, for example because it was not written down in so many words; the court will hold them to it (Chao-Duivis et al., 2018).

The third principle of contract law is the one of no prescribed form, which entails that an agreement comes into being through the mere agreement of the parties' intention (Chao-Duivis et al., 2018). As soon as two parties notify one another that they are in an agreement, the agreement comes into being. In Dutch contract law, there is no legal requirement to formalise an agreement in writing or to bring in a civil-law notary (Chao-Duivis et al., 2018). The consensus between the parties is sufficient, which is why the principle of no prescribed form is also known as 'consensualism'. As with the other principle, this one is not without limitations. In some cases the law does lay down a particular form for certain important agreements. Such prescribed forms are often established to safeguard weaker parties. In addition, setting down agreements that involve substantial interests or are complex or long-lasting in writing and in clear terms is often done to avoid subsequent problems in establishing what had been agreed (Chao-Duivis et al., 2018).

4.2.3 The English legal system

Common law as a legal system originated in England, where the social, economic and political history and foundation of the law derive from the feudal system and its incentives (Dainow, 1966). In his study, he describes that 'One aspect of this system was that the settlement of disputes was conducted on a purely local level, each region acting independently and without knowledge of what the others were doing. The rights and obligations of individuals flowed from the nature of their personal status within the system.' (Dainow, 1966, p. 422) During the period of the the common law's development, the king sought to consolidate a centralised power. To this end, he had his own court judges travelling around the country, delivering rulings that established the first uniform legal principles and laid the foundation for uniformity within the legal system. These rulings established general norms that were commonly applied across the entire country; hence the name, common law. This reflects the essence of common law, as well as the main distinction between civil law and common law. Common law is based on judicial decisions, or case law, as opposed to civil law, which is based on a codified system (Dainow, 1966; Pejovic, 2001).

Case law refers to the principle that when a court resolves a specific case, its decision not only governs the parties involved, but also establishes a legal precedent that must be followed in future cases of a similar nature (Dainow, 1966; Pejovic, 2001). This process integrates the court's decisions into the wider body of common law. As a result, the common law evolves as a body of rules derived from judicial decisions, with new cases addressing new issues and thereby enriching its scope.

As Dainow (1966) explained, the common law was designed to be comprehensive and adaptable. If no existing rule dealt with a particular issue, it became the duty of the judge to declare one. Judicial decisions thus served both as a source of law and as evidence of its application to factual scenarios, making the judge be the focal point of the development of common law.

The doctrine of precedent ensured stability and continuity within this system (Dainow, 1966). Once a legal issue had been decided, subsequent cases dealing with the same issue were obliged to reach the same conclusion by following the established precedent. However, this rule only applied to the 'ratio decidendi', i.e. the essential reasoning necessary to reach the decision. Other comments or observations by the court, known as 'obiter dicta', were not binding (Dainow, 1966).

In cases where a new situation was similar but not identical to a previous one, a judge had two options. If it was socially desirable to maintain consistency, the judge could apply the previous rule. Conversely, if the circumstances suggested that a different outcome was appropriate, the judge could distinguish the case by limiting the application of the earlier decision to its specific facts. In exceptional cases, a court could reject an earlier decision as incorrect and overturn it, thereby establishing a new precedent (Dainow, 1966).

The first two techniques, following precedent and applying the rule, provided stability and continuity in the law, offering protection to the parties involved and ensuring the security of legal relations. In contrast, the latter two techniques, distinguishing and overruling, introduced flexibility, allowing the law to adapt to new circumstances.

Under English law, a contract is an agreement giving rise to obligations which are enforced or recognised by law (Allen & Overy, 2016). In common law, there are three essentials to the creation of a contract. These are reaching an agreement, form and consideration, and the contractual intention (Allen & Overy, 2016; Anson & Huffcut, 1879). The first requisite of a contract is that the parties should have reached an agreement, which requires at least two parties for its existence (Allen & Overy, 2016; Anson & Huffcut, 1879). Obligation is a legal relationship by which a person or group of persons is constrained to act or refrain from acting on behalf of another person or group (Anson & Huffcut, 1879). Its characteristics are that it consists of a control which one or both of two persons or groups may exercise over the conduct of the other, that the relationship requires two parties which must be definite, and that the liabilities of the obligation relate to definite acts or omissions (Anson & Huffcut, 1879).

The first principle of English contract law is that an agreement is to be reached. For this, at least two parties are needed, where one party makes an offer, which is accepted by another party. An offer is an expression of willingness to enter into a contract under specific terms, made with the intention of becoming legally binding once accepted by the intended recipient (Allen & Overy, 2016). There must be an objective indication of the offeror's intention to be bound if the offer is accepted by the other party. Therefore, the offeror will be held accountable if their words or actions would lead a reasonable third-party observer to conclude that they intend to be bound, even if the offeror does not actually possess such an intention (Allen & Overy, 2016).

Acceptance is a final and unqualified expression of agreement to the terms of an offer. As with offer, acceptance of the offer by the recipient has the intention of becoming legally binding, and can be done by conduct (Allen & Overy, 2016). An offer must be accepted in accordance with all its precise terms if it is to constitute a contract. Acceptance has no legal effect until it is communicated to the offeror. The general rule is that a postal acceptance takes effect when the letter of acceptance is posted (Allen & Overy, 2016). It is important to note that an offeror cannot stipulate that the offeree's silence is equivalent to acceptance. An offer may be revoked at any time before it is accepted, but the revocation must be communicated to the offeree for it to be effective (Allen & Overy, 2016). Once an offer has been accepted, the parties have an agreement, which forms the basis of a contract.

The second principle states that, in common law, a promise requires additional evidence to demonstrate the intention of the parties to create legal obligations for it to be considered a binding contract (Allen & Overy, 2016; Anson & Huffcut, 1879). This evidence is typically provided by form or consideration, or sometimes both (Anson & Huffcut, 1879). Form refers to the formalities associated with the expression of agreement. The general rule in English law is that contracts can be made both formally and informally. Formal contracts are expressed in written communication, whereas informal contracts can emerge orally or through conduct (Allen & Overy, 2016; Anson & Huffcut, 1879). Thus, an informal exchange of promises can still be as binding and legally valid as a written contract. There are, however, some exceptions to this rule. For example:

- A lease lasting more than three years must be executed by deed, Law of Property Act 1925, §52(2) (UK Public General Acts, 2012),
- Contracts for the sale or disposition of an interest in land must be made in writing, Law of Property (Miscellaneous Provisions) Act 1989, §2 (UK Public General Acts, 2010),
- Contracts of guarantee must be evidenced in writing, Statute of Frauds, §4 (Acts of the English Parliament, 2011).

Consideration refers to something of value exchanged for a promise, making the promise legally binding as part of a contract (Allen & Overy, 2016). An informal promise without consideration is not a contract. Consideration must be provided by the promisor. Traditionally, only the person who has given consideration in exchange for a promise has the right to enforce it. If the consideration is provided by a third party, that person typically has no right to enforce the promise (Allen & Overy, 2016). However, in under the Contracts (Rights of Third Parties) Act 1999, a third party may be granted the right to enforce terms of a contract that benefit them, provided the statutory conditions are satisfied (UK Public General Acts, 2011, §1).

The third principle of English contract law concerns the contractual intention. An agreement, even if supported by consideration, is not a binding contract if it was made without an intention to create legal intentions (Allen & Overy, 2016). This means that the parties must intend their agreement to be legally binding.

Once a contract is created under English law, it complies with the parole evidence rule (Andrews, 2015; Halberda, 2020; Zuppi, 2007). This rule belongs to the common law tradition and provides that a written document, intended by the parties as the final expression of their agreement, cannot be challenged by past or contemporary evidence contradicting it or modifying its content (Zuppi, 2007). The parole evidence rule has an important role in the interpretation of contracts created under the English common law. When parties get into a conflict or dispute, the words, expressions, terms, and usages of the written document must be interpreted by the court (Andrews, 2015; Halberda, 2020; Zuppi, 2007). If the parties have expressed their intention in an ambiguous way, although the agreement is considered to be the final expression of their intention, the court must rely on the words chosen to resolve the ambiguity. The parole evidence rule thus rejects the principle of reasonableness and good faith and seeks to promote legal certainty (Halberda, 2020; Zuppi, 2007).

However, in the last decades, the rule has suffered considerable changes by reducing the extent of its application through the admission of endless exceptions admitted by the principle of case law (Zuppi, 2007). Also, various parties have started including express provisions in their contracts that require the parties to act in good faith when drafting, interpreting or performing a contract, as well as in cases of revision of the terms of the contract (Halberda, 2020). Additionally, the parole evidence rule was traditionally applied to written documents, which implied a writing in paper (Zuppi, 2007). Nowadays, electronic documents and communication are of common use, which help to show the parties' true intentions more accurately and contribute to clarify the context in case of ambiguities (Zuppi, 2007). Modern English courts and arbitrators applying English law are no longer bound by the literal wording of the written contract, but can consider the parties' common intention in the context of interpreting the contract, referred to as 'matrix of facts' (Andrews, 2015; Zuppi, 2007). Zuppi (2007) concludes that there remains only a hybrid form of the rule as it was originally conceived, moving towards a more civil law understanding of clarifying a written agreement.

4.2.4 Conclusions on contract law within the legal system

The Dutch and English legal systems have both similarities and differences in the way they regulate organisational and role-specific behaviour within construction projects. One similarity is that both systems provide a structured legal framework to guide contractual behaviour and manage relationships in construction projects. They emphasise clarity, enforceability and mutual accountability to ensure predictable outcomes. In both systems, contracts are central to defining the roles, responsibilities and obligations of the parties involved, where the chosen procurement route sets the initial framework. Additionally, both systems include mechanisms to deal with unforeseen circumstances, thereby promoting fairness, adaptability, and flexibility.

There are, however, also a number of key differences in the two legal systems. Dutch civil law is codified and based on broad statutes interpreted by principles such as reasonableness and fairness and the Haviltex criterion. This approach allows for a contextual understanding of contracts, emphasising the parties' intentions alongside the text. English common law, on the other hand, is precedent-based and develops through judicial decisions that create binding standards. This system has traditionally prioritised the parole evidence rule, focusing on the text of written contracts, but recent shifts have allowed for greater consideration of the parties' intentions and contextual factors.

In terms of contractual principles, Dutch law explicitly codifies the freedom to contract, the binding

nature of agreements, and no prescribed form. While English contract law has similar principles of agreement, form and consideration, and contractual intent, it places particular emphasis on consideration as a prerequisite for enforceability, a concept that is less central to Dutch law.

The characteristics of these regulative systems eventually evolve into norms and values. Similar norms and values of the two systems are accountability, cooperation, adaptability, fairness, predicability, and enforceability. They do, however, have some differences as well. The Dutch system emphasises flexibility within structured boundaries, trust, proactive risk management, and contextual understanding of agreements, whereas the English system focusses on clarity, reliance on consistency, and reciprocity and structured frameworks.

4.3 Construction disputes and resolution methods

In case of non-performance of the obligations set out in a contract, disputes can arise. In the construction industry, a dispute is defined as a formal disagreement that arises when contractual issues or claims are not resolved by the parties involved and require resolution outside the immediate management of the project (Alaloul et al., 2019; Cheung, 2014). It is important to note that disputes are different from conflicts. While conflicts are inherent to differing interests and can be managed to prevent escalation, disputes require resolution and often involve distinct legal issues (Alaloul et al., 2019; Cheung, 2014). Figure 4.8 shows the interrelationships between conflicts, claims, and disputes. The submission and rejection of a claim results in the initial emergence of a dispute. Consequently, a claim is regarded as a request for reimbursement for losses, and a dispute is understood to be the consequence of claim refusal or rejection by construction project parties, often involving distinct legal issues (Alaloul et al., 2019; Cheung, 2014; Naji et al., 2020).

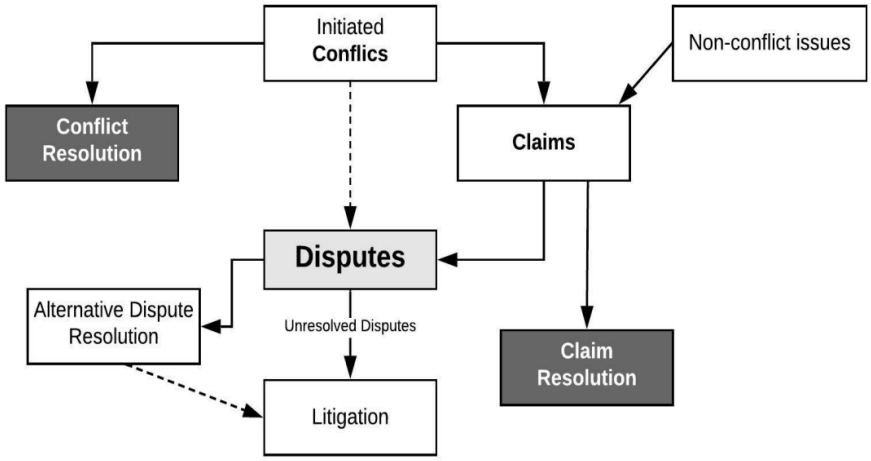

Figure 4.8: *The interrelationships between conflicts, claims, and disputes (Naji et al., 2020).*

Friedrich Glasl's conflict escalation model depicts the development of conflicts, see figure 4.9. Each step on the ladder affects people's behaviour, attitudes, and ways of thinking (Jordan, 2000). Glasl's escalation model is a useful diagnostic tool for conflict resolution. It shows what steps should be taken to prevent conflicts from spiralling out of control. For this study, the model can also be used to explain when a conflict evolves to a dispute. As defined by Alaloul et al. (2019) and Cheung (2014), disputes require the intervention of a third party to resolve, whereas conflicts can be resolved within the immediate management of the project. Looking at Glasl's conflict escalation model, a conflict would be recognised as a dispute when it falls into the fourth stage or higher. In Appendix A, the aspects of each stage in the model are described.

When parties are in conflict, they usually aim for a win-win situation resolving the conflict (Cheng et al., 2009; Sayed-Gharib et al., 2010). However, the higher the step on Glasl's model of conflict escalation, the more unlikely it is to reach a win-win outcome, and the probability to end up in a win-lose, or even a lose-lose

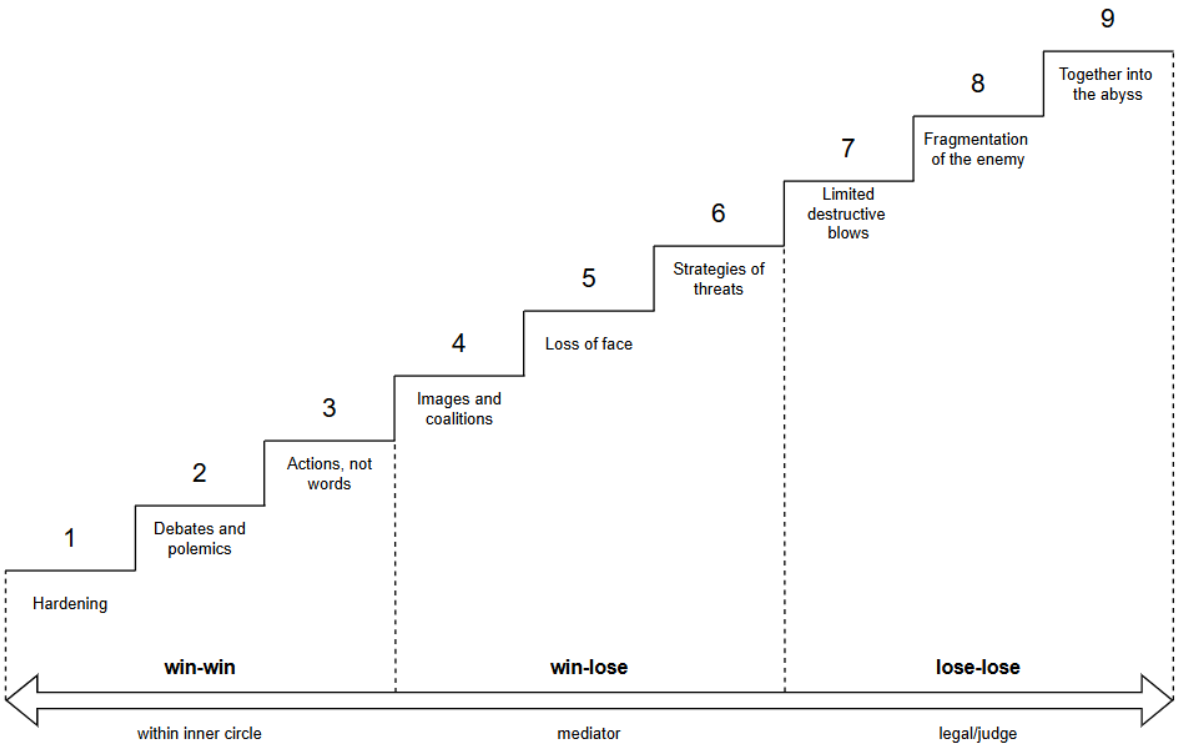

Figure 4.9: *Glasl's model of conflict escalation, based on Jordan (2000).*

situation, increases. A lose-lose situation can be reached due to wasted time and cost of lawyers (Sayed-Gharib et al., 2010). Disputes need to be resolved in order for the project to move on and to prevent the project from exceeding the planning or budget due to discussions not being resolved (Assah-Kissiedu et al., 2010; Cheung & Pang, 2013; Farooqui et al., 2014; Koc & Skaik, 2014). The following working definition of disputes is formulated for this study: disputes are conflicts that require third party intervention to resolve in order for the project to proceed. In the following sections, the causes of construction disputes and the various methods developed for dispute resolution are discussed.

4.3.1 Causes of construction disputes

Many studies have found that risks, uncertainties, inadequate contract documentation, and behavioural factors are notable dispute sources (Assah-Kissiedu et al., 2010; Cheung & Pang, 2013; Farooqui et al., 2014; Koc & Skaik, 2014). Antoniou and Tsioulpa (2024) present a risk breakdown structure of 39 causes of claims frequently resulting in disputes after conducting an extensive bibliometric review of 50 case studies, shown in figure 4.10. The study identifies seven main causes of claims, which are related to the contracting authority (CA), contractor, design, contract, human behaviour, project, or external factors (Antoniou & Tsioulpa, 2024).

A different approach is taken by Cheung and Pang (2013), who argue that construction disputes can either be contractual of speculative, see figure 4.11. In their paper, they describe that construction disputes arise when either a contractual or a speculative dispute occurs. Contractual disputes result from a combination of contract incompleteness and 'task factors', while speculative disputes stem from a combination of contract incompleteness and 'people factors'. A task factor is a source of disputes in contracts triggered by risk and uncertainty as well as the collaborative conflict of a construction project, whereas people factors are conflicts stemmed from cognitions, behaviours, and emotions of the people involved (Cheung & Pang, 2013). As contract incompleteness underpins both contractual and speculative disputes, Cheung and Pang (2013) categorise it as a root cause for construction disputes. Appendix B provides an overview of the 46 basic

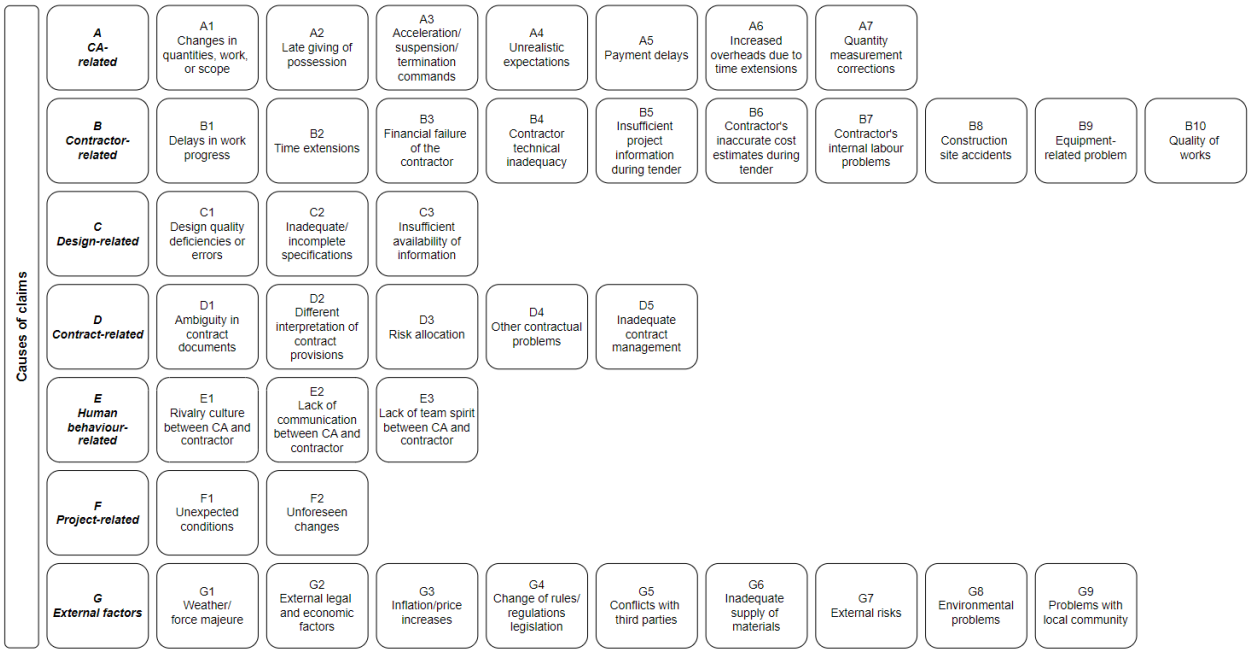

Figure 4.10: *Causes of claims breakdown structure (Antoniou & Tsioulpa, 2024).*

events identified by Cheung and Pang (2013) that lead to a construction dispute when occurring in a certain combination. Antoniou and Tsioulpa (2024) share the same view as Cheung and Pang (2013), and identify the contract as one of the most important causes for disputes.

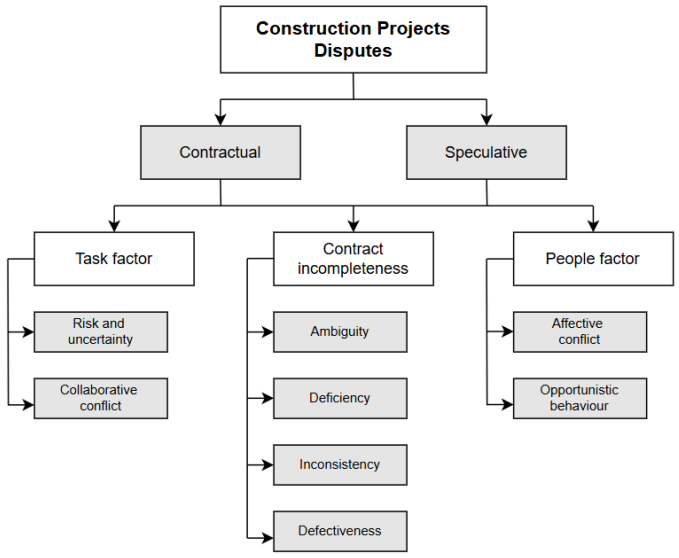

Figure 4.11: *Causes of construction disputes, based on Cheung and Pang (2013).*

Sayed-Gharib et al. (2010) discuss two publications that discuss dispute elements. These found that the nature and dimensions of any dispute are verified by a number of elements, including values of parties, the nature of their relationships, external effective factors or moods, available data on the dispute, individual authority structure in different parties, and the disputed interests, see figure 4.12 (Sayed-Gharib et al., 2010). In their paper, Sayed-Gharib et al. (2010) describe that it is the values and beliefs of various parties that

play an important part in the occurrence of disputes. These values include religious and ethical values and professional ethics and conscience, as well as the more day-to-day values, such as customer service and loyalty to the company. Sayed-Gharib et al. (2010) describe that disputes are usually the result of differences in viewpoints and understandings of these values, which affect the evaluation of the parties from each other. These value-related conflicts tend to be heated and personal, due to values, morals, and ethics being of high importance to human beings (Sayed-Gharib et al., 2010).

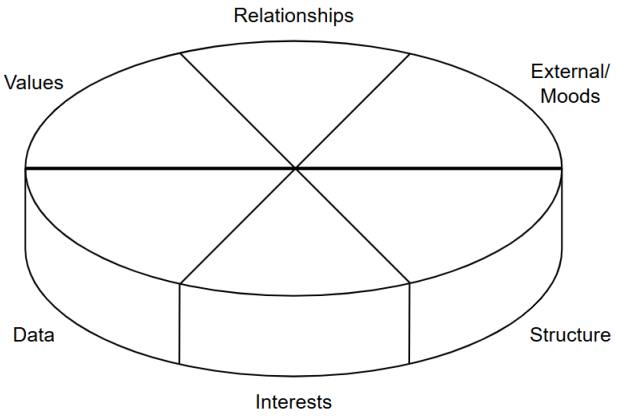

Figure 4.12: *Dimensions of disputes (Sayed-Gharib et al., 2010).*

According to Safinia (2014), disputes and confusion are common in all aspects of the construction industry due to their nature. However, as asserted by Assah-Kissiedu et al. (2010), the nature of construction disputes can vary significantly in terms of complexity and size. Nevertheless, they have a common thread of being costly both in terms of time and money and have the ability to damage working relationships. This tendency to destroy relationships and the exceedances of the schedule and budget of construction projects has prompted a common interest among researchers in different countries to understand the nature of the causes of construction disputes (Assah-Kissiedu et al., 2010; Farooqui et al., 2014). They aim to understand the causes of construction disputes to formulate measures to prevent or minimise their occurrence or to resolve them quickly, efficiently and cost-effectively (Assah-Kissiedu et al., 2010; Farooqui et al., 2014; Safinia, 2014). Preventing disputes is advised to the industry by improving communication and understanding of other objectives in the culture of the industry (Cheung, 2014; Safinia, 2014). However, sometimes disputes are inevitable and need to be handled and resolved (Lee et al., 2016). The following section describes the most commonly used dispute resolution methods.

4.3.2 Formal models for dispute resolution

Chao-Duivis et al. (2018) and Roxenhall and Ghauri (2004) describe that, since a contract sets out the responsibilities of the parties involved, it is the default mechanism for the resolution of disputes. It is, however, often the case that disputes can not be resolved solely looking back at the contract, since the causes of disputes can also be non-contractual, as described in the previous section. For that reason, various formal dispute resolution methods have been developed to address and resolve the different types of disputes, regarding their nature, size, and complexity (Alaloul et al., 2019; McQuoid-Mason, 2020; Paaga & Dandeebo, 2014; Safinia, 2014). Figure 4.7 showed how the available formal remedies for dispute resolution are placed within the contractual framework. The literature distinguishes two main approaches in dispute resolution methods: traditional and alternative dispute resolution (ADR). Common resolution methods are litigation, arbitration, adjudication, mediation and negotiation. Though the literature often mentions the same resolution methods, there is no universal agreement as to which methods categorise as traditional and which are ADR methods (Alaloul et al., 2019; McQuoid-Mason, 2020; Paaga & Dandeebo, 2014; Safinia, 2014). A common feature of all ADR is that the process is less formal than litigation (Alaloul et al., 2019; McQuoid-Mason, 2020; Safinia, 2014).

Litigation

Alaloul et al. (2019) define litigation as the most traditional form of dispute resolution. Litigation in construction is defined as the process of taking or contesting legal action in court as a means of resolving a dispute (Alaloul et al., 2019). Whenever the outcome of a dispute is almost certain, and it is expected that litigation will not be a time-consuming process, litigation is the best choice to resolve disputes and regain rights (Alaloul et al., 2019). However, when this is not the case, litigation has been found to be an unfavourable process since it usually involves an extended time of disclosure, its procedures tend to be inflexible, and it is subject to constant delay (Alaloul et al., 2019; Rendell, 2000). These factors contribute to litigation being seen as the costliest way of resolving disputes (Arditi et al., 1998). In addition, many construction experts believe that litigation is not an appropriate means of resolving disputes in the construction industry. One reason for this is that construction projects are built on good relationships between the parties, and any future work generally depends on the present and past relations between the parties (Alaloul et al., 2019). Delise et al. (2023) posit that it is appropriate for project managers to review data from past similar projects to evaluate their focal project's performance, especially in smaller-scale projects. The paper by Alkilani and Loosemore (2022) studies small-and-medium sized contractor's project and business performance measurement indicators. Important extra-organisational variables affecting project performance are the management effort and communication of the client, as well as good relationships and proper communication of the consultant. Literature shows the coherence between these factors, emphasising the importance of good communication and relationships when reviewing project performances (Abiodun et al., 2017; Chaudhari et al., 2015; Jagtap & Kamble, 2019; Mofleh, 2021; Sweiss et al., 2014; Xiong et al., 2014). Figure 4.13 displays the position of the different resolution methods on a scale of cost, time, and hostility. As can be seen, litigation scores highest on all three aspects. As a result, ADR methods have been developed.

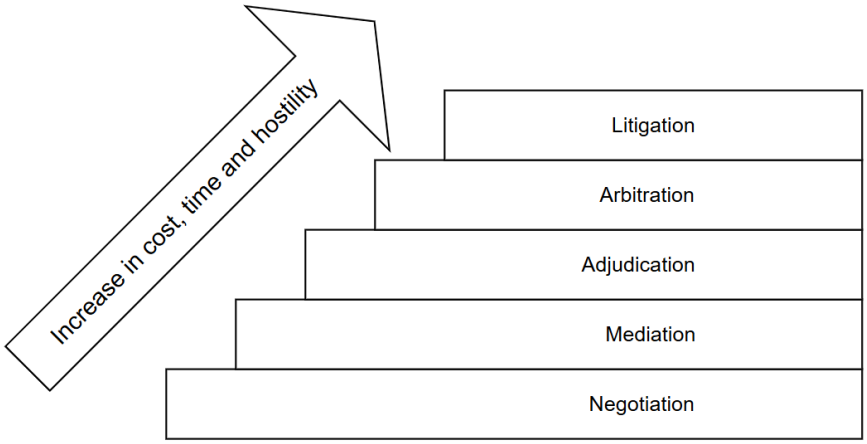

Figure 4.13: *Dispute resolution mechanisms commonly used in construction, based on Cheung (2014).*

Negotiation

Negotiation is a direct, informal dispute resolution process in which parties seek to reach a mutually agreeable settlement and serves as the basis for all ADR methods (Alaloul et al., 2019). It is a universal and fundamental method of conflict resolution due to its simplicity, cost-effectiveness and emphasis on preserving relationships (Alaloul et al., 2019; Safinia, 2014). The process involves an open discussion to identify common interests and reconcile differences. However, its success depends heavily on the parties' intentions and willingness to compromise, as there is no third party facilitator in negotiation, making it entirely self-directed. When negotiations are not successful, other ADR methods are referred to (Alaloul et al., 2019).

Mediation

Many studies on dispute resolution methods discuss the mediation process and consider it to be the most important method of ADR, referring to the study by Murdoch and Hughes (2008). Mediation is a structured, non-binding negotiation process in which a neutral third party mediator facilitates dialogue between disputing parties helping them to work towards a mutually agreed solution (Alaloul et al., 2019; Safinia, 2014). This informal approach is particularly valuable where maintaining professional relationships is crucial. Mediation is generally initiated voluntarily or by court order, with the mediator actively facilitating discussions to clarify each party's perspective (Alaloul et al., 2019). An advantage of mediation is its affordability, confidentiality, and ability to encourage co-operation. Another favourable feature is that all issues in dispute are discussed face-to-face, rather than through lawyers or other intermediaries, which gives the parties a sense of control over the outcome and increases their commitment to the resolution (Alaloul et al., 2019). However, as a non-binding process, the success of mediation depends entirely on mutual agreement and, in the case of unresolved disputes, could become a tiresome process and even lead to adjudication, arbitration or litigation (Alaloul et al., 2019).

Adjudication

Adjudication is a resolution method where an independent third party, the adjudicator, is appointed to make a decision outside of court (Alaloul et al., 2019; Fenn & Gameson, 1992). It serves as a quicker and more cost-effective alternative to litigation and arbitration as the third party assesses both parties' claims, clarifying rights and obligations through a paper review of arguments rather than extensive evidence gathering (Fenn & Gameson, 1992). Its primary benefit is its efficiency in resolving disputes without the formalities of court procedures, making it both accessible and adaptable. However, decisions made in the adjudication process are only temporarily binding and can later be challenged in court or through either litigation or arbitration (Fenn & Gameson, 1992). Unlike arbitration, the adjudication process does not require both parties' consent to begin, but it is typically initiated by one party submitting a Notice of Adjudication (Fenn & Gameson, 1992).

Arbitration

In arbitration, unresolved disputes are submitted to a neutral third party whose legally binding decision is recognised by both parties, as opposed to litigation (Alaloul et al., 2019; Safinia, 2014). Designed to be a faster, less formal, and more cost-effective alternative to litigation, arbitration offers privacy and flexibility, including the choice of arbitrators and control over hearing arrangements (Alaloul et al., 2019). The process generally involves presenting evidence, allowing the arbitrator, often an expert, to make a binding ruling. Unlike litigation, arbitration requires the mutual consent of disputing parties, is typically confidential, and accommodates a broader range of evidence than litigation (Alaloul et al., 2019). Generally, disputing parties who wish to maintain good relations after the dispute has been resolved are advised to seek arbitration. However, over the years, the informality of the process has begun to change (Alaloul et al., 2019). Arbitration has become a more structured, elaborate and expensive process than before, resulting in losing its advantages over litigation, which it was originally designed for. The process is also not guaranteed to run smoothly being subject to constant delays caused by scheduling conflicts between the parties and the arbitrators.

4.3.3 Practical dispute resolution methods

Described in the previous section was that, since a contract sets out the responsibilities of the parties involved, it is the default mechanism for the resolution of disputes (Chao-Duivis et al., 2018; Roxenhall & Ghauri, 2004). Despite the development of formal dispute resolution methods as an alternative to the contract, Marathe et al. (2017) challenge the effectiveness and efficiency of those models in practice. The terms effectiveness and efficiency are commonly used interchangeably in practice (Burches & Burches, 2020). In scientific field, the terms do have a distinct meaning. Effectiveness is derived from the adjective effective, which suggests 'adequate to accomplish a purpose; producing the intended or expected result.' (Patel, 2021, p. 34) Effectiveness measures how well it does whatever its alleged to do (Patel, 2021). Burches and Burches (2020) describe effectiveness as 'the degree to which something is successful in producing a desired result'

(p. 1). In this thesis, effective dispute resolution is, therefore, defined as dispute resolution that is successful in achieving the desired objectives. Efficiency is about doing things in the most economical way. It is the ratio of the output to the inputs of any system (Burches & Burches, 2020; Patel, 2021).

In their research, Marathe et al. (2017) present the results of an exploratory study comparing perceptions about dispute resolution methods and incentive clauses by four standard contract forms. Experienced construction professionals were interviewed to identify shared issues in favour and against various aspects of the contract standards. From this study it emerged that there was a strong consensus among the participants on the issue of practicality of dispute resolution methods. The formal models look good theoretically, but are anecdotal and rarely work out as planned in practice. Additionally, it was mentioned that there is not enough empirical evidence to prove that the formal methods work in practice as planned in a contract. The paper concludes by stating that the issues of stakeholder preferences and stakeholder business interests are critical to the successful implementation of dispute resolution methods.

Stakeholder preferences refer to the methods or choices that stakeholders favour based on their personal or professional inclinations. According to Marathe et al. (2017), preferences are often influenced by factors such as ease of process, familiarity or perceived strategic advantage. For example, stakeholders may choose dispute resolution methods that put them in a stronger position, even if these methods differ from those outlined in the contract.

Stakeholder interests are the underlying motivations or goals that drive stakeholder behaviour. Interests can be financial, strategic or legal in nature and are typically more fundamental than preferences. Marathe et al. (2017) point out that dispute resolution methods and contractual incentives often only work effectively if they are aligned with stakeholders' business interests. If a dispute resolution method does not serve stakeholders' interests, they may disregard contractual provisions and resort to alternative mechanisms.

4.3.4 Conclusions on construction disputes and resolution methods

Glasl's model of conflict escalation provides a valuable framework for understanding how conflicts develop and offers insights into how to prevent them from becoming disputes. In the early stages, conflicts are more manageable and amenable to win-win solutions. As conflicts escalate, they become increasingly hostile, ending in win-lose or lose-lose outcomes. For this study, the following definition for disputes is formulated: disputes are conflicts that require third party intervention to resolve in order for the project to proceed. Glasl's model emphasises the importance of early intervention to minimise the cost, time and relationship damage associated with unresolved disputes (Jordan, 2000).

Early intervention requires an understanding of the root cause of the dispute. By identifying these root causes, stakeholders can take proactive measures. This not only reduces the likelihood of disputes, but also minimises their impact when they do occur. A thorough understanding of these causes enables parties to prevent disputes from escalating, maintain project schedules and budgets, and preserve working relationships, ultimately contributing to more efficient and smoother project delivery. Cheung and Pang (2013) provide a comprehensive overview of various basic events identified by that lead to construction disputes when occurring in a certain combination.

Several formal dispute resolution methods are developed to resolve the dispute that has occurred. However, Marathe et al. (2017) emphasise the practical ineffectiveness of those models and conclude by stating that the people factor, including stakeholder preferences and stakeholder interests, are critical to the successful implementation of dispute resolution methods, rather than any formally stipulated methods.

4.4 Digital developments in dispute resolution practices

Since the first Industrial Revolution, subsequent revolutions have occurred, resulting in newer, automated manufacturing processes, increasing sustainability and efficiency, see figure 4.14 (Vaidya et al., 2018). Since the start of the fourth Industrial Revolution, also referred to as Industry 4.0, adopting and applying digital technologies has become an inevitable choice for various industries and enterprises to sustain competitiveness (Huang et al., 2017; Mergel et al., 2019; Verhoef et al., 2021). However, Liu et al. (2023) mention that the construction industry is one of the least digitally advanced industries. The paper discusses that 'As the

construction industry is project-based, the digital transformation of the construction industry or construction enterprises is considerably determined by successfully digitalising construction projects.' (Liu et al., 2023, p. 1).

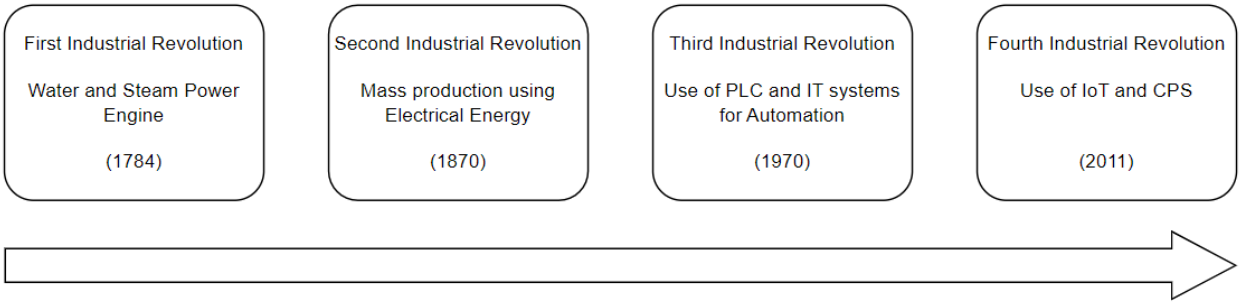

Figure 4.14: *The Industrial Revolutions over time (Vaidya et al., 2018).*

In the quote by Liu et al. (2023), both the terms 'digital transformation' and 'digitalisation' are mentioned. In the broader field of digital transformation, a third term appears in the literature, namely 'digitisation'. Digitisation is defined as the conversion from analogue to digital and manifests in, for example, the use of digital formats for various documents, online platforms for sharing and storing documents, and design software (Xu et al., 2021). Digitalisation is defined as the use of digital technologies to change, or even improve, business processes (Bumann & Peter, 2019; Unruh & Kiron, 2017). Bumann and Peter (2019) describe the process towards digital transformation by means of these three consecutive phases, as shown in figure 4.15.

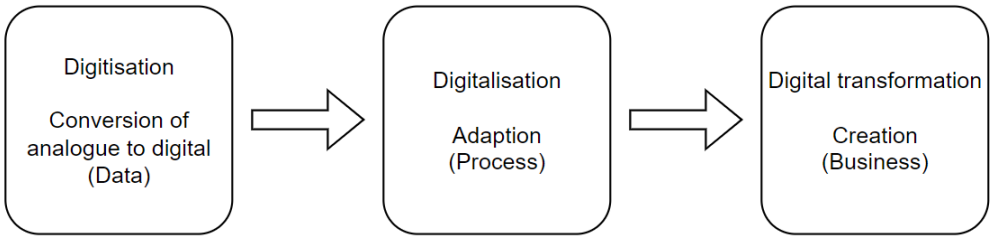

Figure 4.15: *The three phases of digital transformation (Bumann & Peter, 2019).*

According to Liu et al. (2023), digitalising construction projects is of great significance to facilitate the digital transformation of the construction industry. Adekunle et al. (2021) describe how digitalisation in the construction industry generally refers to the use of digital technology to fundamentally change construction processes, improving construction performance and productivity to achieve better project outcomes and stakeholder satisfaction. The next section discusses the developments of digital technologies in dispute resolution processes.

4.4.1 Novel technologies in dispute resolution

The paper by Kalogeraki and Antoniou (2024) discusses current research trends of novel technologies to enhance claim management and dispute resolution practices in the architecture, engineering, and construction industry. The paper provides an overview of novel technologies addressing claims in construction by project phase and cause of claims, as shown in table 4.4. In this table, the causes of claims correspond to the codes given in figure 4.10.

Kalogeraki and Antoniou (2024) found that BIM (Building Information Modelling), blockchain, and smart contracts are more significant than AI (Artificial Intelligence), ML (machine Learning), NN (Neutral Networks), fuzzy logic, and SEM (Structural Equation Modelling). For that reason, only BIM, blockchain, and smart

Table 4.4: *Novel technologies addressing claims in construction by project phase and cause of claims (Kalogeraki & Antoniou, 2024).*

Novel Technologies	Project Phase	Cause of Claims
Fuzzy logic and SEM	Pre-construction	-
Smart contract and BIM	Construction	Payment delays (A5).
Blockchain	Construction Design/construction/ post-construction	Inadequate document management (D5). Change in scope (A1); insufficient availability of information (C3).
Smart contract and blockchain	Procurement Construction	Quality of work (B10). Payment delays (A5); ambiguity in contract documents (D1); quality of work (B10).
AI/ML/NN	Construction (early stages) Pre-construction	Inadequate/incomplete specifications (C2); lack of communication between CA and contractor (E2). Delays in work progress (B1); change in scope (A1); project characteristics (F1, F2).
BIM	Construction Design	Insufficient availability of information (C3). Design errors (C1); lack of communication between CA and contractor (E2); changes in quantities, work, or scope (A1); inadequate/incomplete specifications (C2).
Smart contract	Lifecycle	Contract-related issues (D1, D2, D3, D4, D5).

contracts will be discussed in this study.

BIM

According to various studies, BIM has emerged as a powerful tool for managing and resolving claims in construction projects by leveraging its advanced digital and collaborative capabilities (Ibraheem & Mahjoob, 2021; Kalogeraki & Antoniou, 2024; Parchami Jalal et al., 2020; Shahhosseini & Hajarolasvadi, 2018). BIM facilitates comprehensive project visualisation, precise coordination, and robust documentation, significantly reducing errors, omissions, and misunderstandings that often lead to disputes (Ibraheem & Mahjoob, 2021; Parchami Jalal et al., 2020). A key feature of BIM is its ability to provide accurate 3D visualisations of projects. This capability enables stakeholders to gain a clearer understanding of design elements and construction plans, thereby minimising misalignments between expectations and actual outcomes (Ibraheem & Mahjoob, 2021; Parchami Jalal et al., 2020).

By addressing ambiguities in the design phase, BIM reduces the potential for disputes arising from unclear or misinterpreted designs (Ibraheem & Mahjoob, 2021). BIM also excels in clash detection, automatically identifying conflicts between different design disciplines, such as architectural, structural, and mechanical, electrical, and plumbing (MEP) components (Ibraheem & Mahjoob, 2021; Parchami Jalal et al., 2020). Resolving these clashes in early design phases phase helps prevent errors and claims that might otherwise arise during construction (Parchami Jalal et al., 2020). Furthermore, BIM promotes better coordination and collaboration between stakeholders by providing a shared digital platform (Parchami Jalal et al., 2020). This integrated approach ensures consistency across design, documentation, and implementation, reducing the likelihood of claims stemming from miscommunication or uncoordinated efforts (Parchami Jalal et al., 2020).

BIM also has the ability to generate precise quantity calculations (Parchami Jalal et al., 2020). This functionality ensures that material estimations align with project requirements, minimising disputes related to discrepancies between planned and actual quantities during construction. Additionally, BIM supports efficient documentation management by maintaining a comprehensive and accessible digital repository of

project data, including designs, specifications, and change records (Ibraheem & Mahjoob, 2021). This organised approach enables reliable and well-organised evidence provision for the substantiation of claims and dispute resolution (Ibraheem & Mahjoob, 2021).

By integrating BIM into the design and construction process, project stakeholders can proactively manage potential issues, enhance transparency, and build trust among participants (Ibraheem & Mahjoob, 2021; Parchami Jalal et al., 2020). Considering these characteristics, BIM is found to be an useful tool to handle claims in a more reliable and productive manner (Ibraheem & Mahjoob, 2021; Parchami Jalal et al., 2020; Shahhosseini & Hajarolasvadi, 2018).

Blockchain

Blockchain technology (BCT) is developed to support secure and tamper-proof records of transactions and communications (Pradeep et al., 2021). In the event of disputes, BCT serves as an useful tool for resolving these disputes, as key information exchange transactions and decision points that are critical from a record keeping perspective have been identified (Kim et al., 2022; Pradeep et al., 2021). BCT provides a decentralised and autonomous ledger for secure record keeping, ensuring transparency and preventing disputes arising from data manipulation or loss (Kim et al., 2022; Pradeep et al., 2021).

Kim et al. (2022) describes how the transfer and synchronisation of blockchain information is, to a degree, similar to real-time tracking. It facilitates the tracking of data changes and design modifications, ensuring that responsibilities for errors or disputes are clearly assigned (Kim et al., 2022; Pradeep et al., 2021). By acting as a reliable source of truth for project data, BCT reduces ambiguities regarding liability among stakeholders, thus preventing disputes before they arise (Kim et al., 2022). In cases where disputes do occur, blockchain's immutable records can serve as robust evidence to substantiate claims and support fair resolution (Kim et al., 2022; Pradeep et al., 2021).

Smart contracts

Smart contracts are self-executing agreements with terms embedded directly into code, enabling transparency, security, and immutability (Bandara et al., 2024). Various studies have noted that this technology offers innovative solutions to mitigate disputes and enhance operational efficiency (Bandara et al., 2024; Rathnayake et al., 2022; Ye et al., 2022). The implementation of smart contracts addresses key challenges in the construction sector, such as payment delays, communication breakdowns, and document management issues. By automating these processes, smart contract enhance security and total productivity (Bandara et al., 2024; Rathnayake et al., 2022). Additionally, smart contracts enhance collaboration and efficiency by eliminating the need for intermediaries, such as legal advisors or banks, reducing associated costs and simplifying workflows (Bandara et al., 2024; Rathnayake et al., 2022; Ye et al., 2022).

Integration with advanced technologies, such as BIM and BCT, further expands their potential (Bandara et al., 2024; Rathnayake et al., 2022; Ye et al., 2022). Sonmez et al. (2022) describe how BIM-integrated smart contracts have significant potential to improve the traditional payment process by speeding up the process and making progress payments less vulnerable to disputes, particularly on lump sum projects. The paper of Pishdad-Bozorgi and Yoon (2022) describes how the use of blockchain-enable smart contracts can enhance trust between the general contractor and subcontractors.

Despite their advantages, literature identifies barriers in the adoption of smart contracts in the construction industry (Rathnayake et al., 2022; Ye et al., 2022). Challenges include technical limitations, legal uncertainties, and resistance to change among stakeholders (Rathnayake et al., 2022; Ye et al., 2022). These issues result in recommendations for further research into the potential of the practical implementation of smart contracts in dispute resolution (Bandara et al., 2024; Rathnayake et al., 2022).

Successful implementation of novel technologies

Liu et al. (2023) describe how novel technologies are expected to bring transformation in project delivery and that they would significantly improve efficiency and productivity. Reality, however, shows that the digitalisation of construction projects has been identified as a challenging task, due to the unique and temporary nature of construction projects, as well as their increasing scale and complexity (Adekunle et al., 2022). Root (2002) adds to this that, because of the conservative nature of the building industry, the culture within the industry is unlikely to undergo significant changes in a short period. In addition, Liu et al. (2023)

describe that existing research on digitalisation of construction projects has mainly been limited to the technical aspect, lacking research on the role of the social aspect. They describe how the technical aspect *supports* the social aspect, meaning that technology helps but does not directly drive the social aspect. It enables communication, integration, and efficiency. The social aspect *facilitates* the technical aspect. Facilitating means that the social structure actively ensures that technology is effectively implemented and used, addressing resistance, training needs, and governance. Liu et al. (2023), therefore, emphasise that the lack of research on the role of the social aspect is a key reason why the construction industry has underperformed in the process of digital transformation.

4.4.2 Conclusions on digital developments in dispute resolution practices

The need for digitalisation in the construction industry has been driven by the increasing complexity, scale, and competitiveness of projects, as well as the demand for greater efficiency and productivity. Industry 4.0, characterised as technology-driven, has created opportunities for transformative improvements in construction processes. Digitalisation promises to enhance project outcomes through better coordination, improved decision-making and streamlined operations.

However, digitalisation in dispute resolution remains underutilised in practice due to several barriers. The unique and temporary nature of construction projects makes it difficult to standardise and integrate digital tools. Technical limitations and legal uncertainties hinder the implementation of these technologies in practice. In addition, stakeholder resistance to change, driven by a lack of familiarity and trust in new technologies, further delays implementation.

Liu et al. (2023) emphasises how existing research has mainly focused on the technical aspects of digitalisation, often neglecting the social dimensions. As a result, the construction industry has struggled to fully embrace digital transformation. Addressing these challenges requires a balanced approach that considers both technical advances and the human factors that are critical to successful digital adoption.

4.5 Conclusions and conceptual framework

This section concludes the literature review and presents the conceptual framework based on that conclusion, shown in figure 4.16. To find an answer to the main research question, the framework consists of two main concepts: culture and digital dispute resolution.

Culture

Firstly, the concept of culture was analysed. Literature shows that there are many different understandings and approaches of the concept. The definition of culture that is followed in this study is formulated by Ankrah and Proverbs (2004), and describe that culture in the building industry is 'what is carried out, how and when it is done, who is involved and why things are done the way they are.' (p. 554)

For the conceptual framework, three models are used to understand culture in the context of this study. The first model is the institutional theory by Scott (2014), providing the basis to understand how cultures, or institutions, are developed. Additionally, Palthe (2014) describe how these three pillars form the basis of any institutional change. The three pillars of the institutional theory show a significant overlap with the cultural layers described in models developed by Schein (2010) and Hofstede (2001). For that reason, the three pillars of the institutional theory are used to represent the cultural layers.

Literature agrees that the cultural layers are present within each cultural level. It is described how the multi-level approach views culture as a hierarchical construct that consists of various levels nested within each other, from the most macro-level to the most micro-level. This study focuses on three cultural levels, based on the studies of Erez and Gati (2004) and Karahanna et al. (2005). These layers are the national, organisational, and role-specific cultures, which form the second model used for the conceptual framework. Each of these levels is relevant to provide an answer to the main research question of this study.

Hofstede (2011) developed the cultural dimensions theory, with the six dimensions power distance, individualism versus collectivism, masculinity versus femininity, uncertainty avoidance, long-term versus short-term orientation, and indulgence versus restraint to understand the behaviour within specific groups

or categories, which can be linked to the cultural levels. Żemojtel-Piotrowska and Piotrowski (2023) describe how Hofstede used this model to understand the behaviour within organisations and national contexts. For that reason, this model is the third one used to explain the concept of culture in the conceptual framework. In order to understand the role-specific behaviour in the context of this research, the second concept of this research needs to be explained: digital dispute resolution.

Digital dispute resolution

The second concept is digital dispute resolution. In this research, disputes are defined as conflicts that require third party intervention to resolve in order for the project to proceed.

Three studies have been the backbone to explain digital dispute resolution. The first study is the one by Cheung and Pang (2013), which explains the anatomy of construction disputes. The model shows that disputes arise when a combination of basic events occur. Additionally, the model included the human factor in the occurrence of disputes, which relates to the second model used for this concept and explains the interaction as shown in the conceptual model.

Marathe et al. (2017) describe that formally stipulated dispute resolution methods can be written and structured in any given way, but they remain ineffective in practice. The paper emphasises that stakeholder's interests and preferences are perceived more important in the successful implementation of dispute resolution methods in practice. This paper, therefore, links the concept of culture with dispute resolution practices.

The third study that is used for this concept is the one conducted by Liu et al. (2023). They describe how existing research on digitalisation of construction projects has mainly been limited to the technical aspect, lacking research on the role of the social aspect. In their paper, Liu et al. (2023) emphasise that this is a key reason why the construction industry has underperformed in the digital transformation process. Since the social aspect described in their paper is closely related to the stakeholder interests and preferences addressed by Marathe et al. (2017) and thus show an interaction.

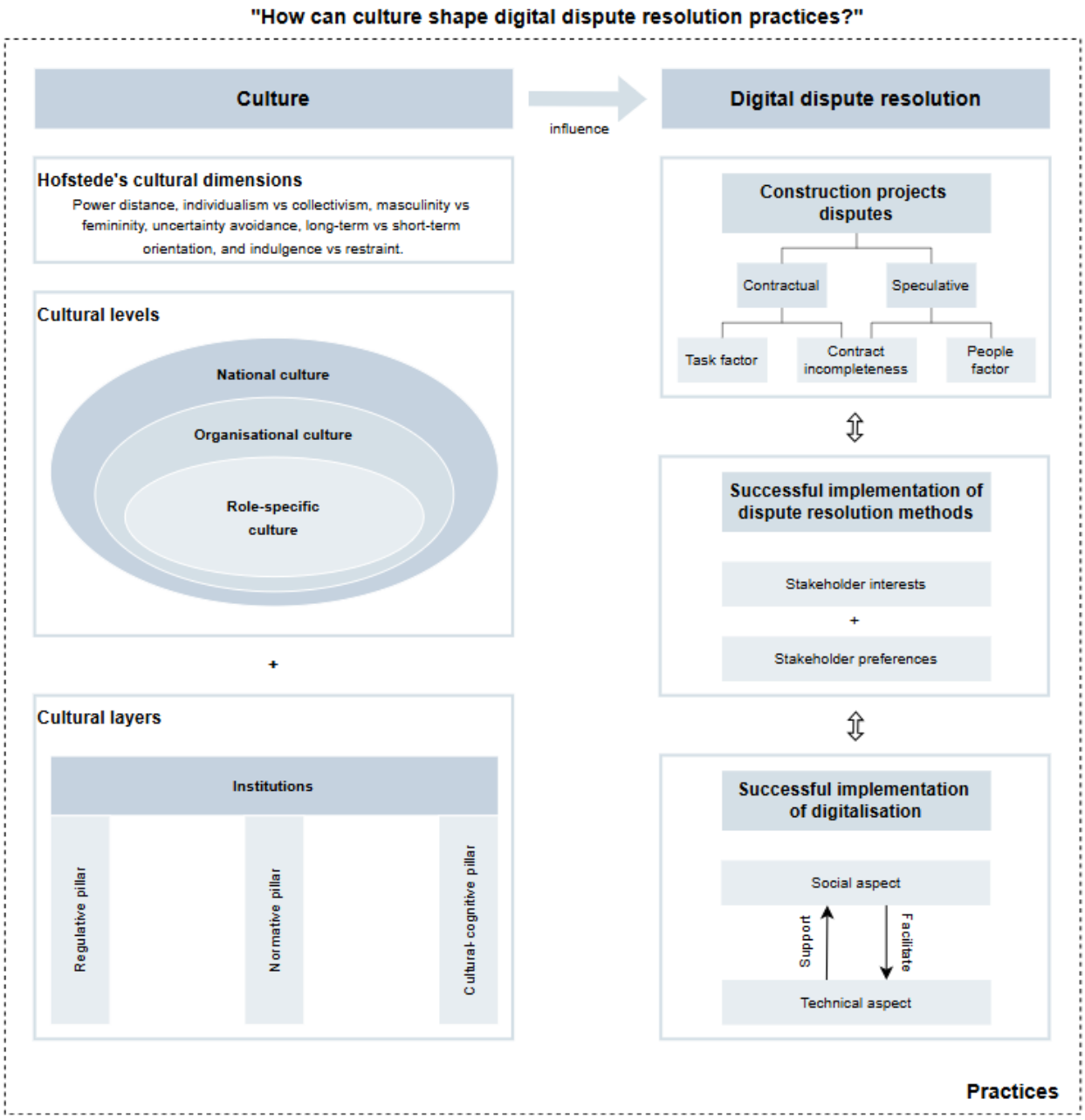

Figure 4.16: *The conceptual framework.*

5. Empirical research

The empirical research covers the case studies conducted in this research. First, the preparation of the empirical research is described. Next, the execution of the research is presented, including the in-case analyses and the conclusions of those analyses. Lastly, the cross-case analysis is executed, which sets the basis for the next chapter, in which the findings will be discussed.

5.1 Preparation

Proper preparation for the empirical research is needed in order to ensure that the research is executed in an structured and organised manner. Figure 5.1 presents the schematic visualisation of the case study procedure and the methods used for the data analyses, based on Yin (2018). In the first phase, cases are selected, based on the conceptual framework, and the protocol for the collection of design data is established. In the second phase, the individual case studies are executed and analysed. The third phase starts with concluding the in-case analysis. After that, the cross-case analysis is executed and conclusions are drawn. The dashed line indicates that the conclusions derived from the cross-case analysis are compared to the existing literature to ascertain whether the conclusions build on the existing body of knowledge or, conversely, offer a novel perspective. This comparison serves as a foundation for developing new theories for potential follow-up studies. The following sections discuss the steps taken in each of these phases in more detail.

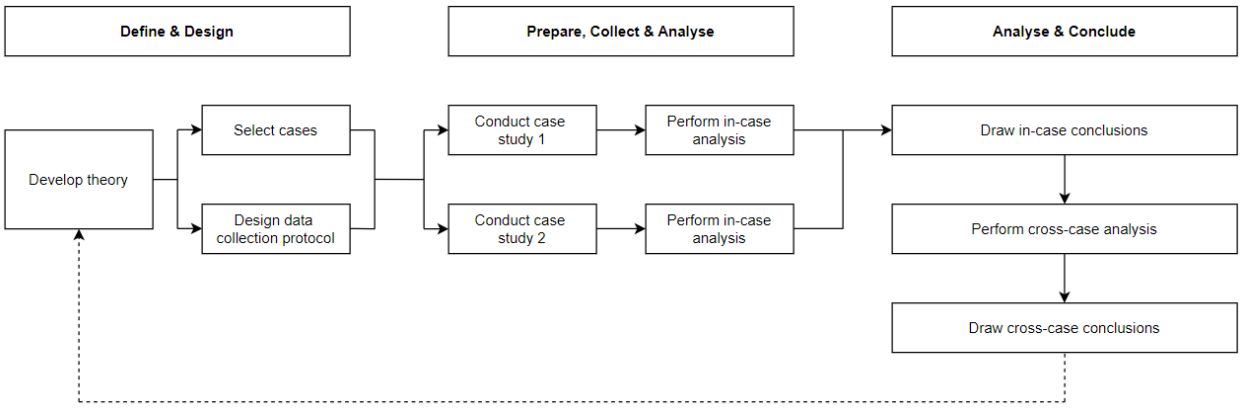

Figure 5.1: *Overview of the case study procedure, based on the study of Yin (2018).*

5.1.1 Case selection

This research is conducted under the guidance of Turner & Townsend, an international independent professional services corporation specialising in programme management, project management, cost management and advisory services across the real estate, infrastructure, and natural resources sectors (Turner & Townsend, 2024). Since this research is conducted under the guidance of Turner & Townsend, the case selection took place within the scope of projects executed by this company.

Turner & Townsend applies their service delivery model at programme, project, and activity level to ensure successful development and delivery of projects. The model consists of three stages:

1. Assessment of requirements, objectives, risks, and outcomes.
2. Development of an optimised strategy to achieve the objectives and outcomes.
3. Delivering the project.

Turner & Townsend is active in three segments: infrastructure, real estate, and energy & natural resources. For real estate projects, figure 5.2 shows navigators of all services and activities associated with the different stages undertaken in those projects. The items under *control* are the services and activities that are associated with all phases.

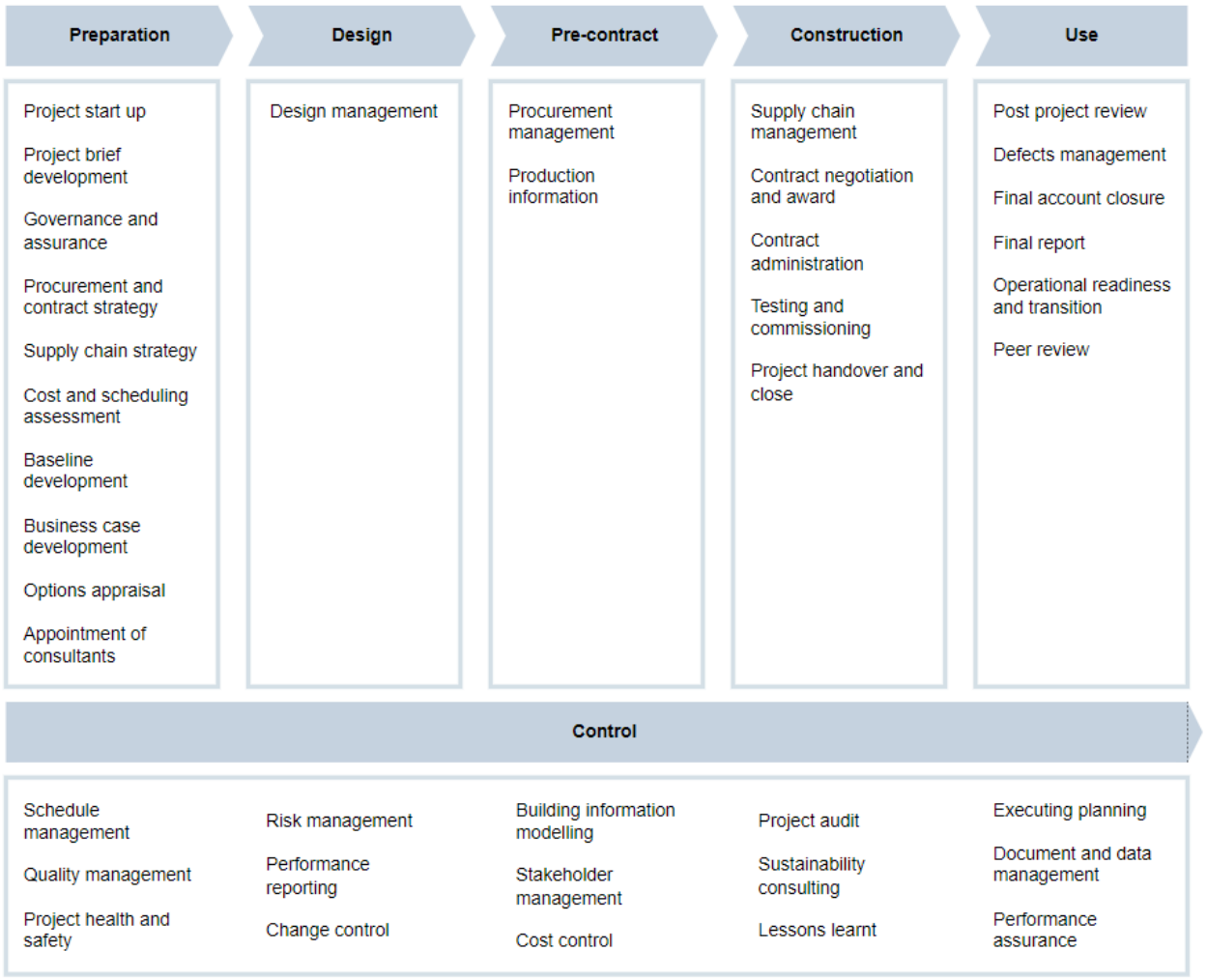

Figure 5.2: *Turner & Townsend service delivery model. Adapted from internal Turner & Townsend documentation.*

For the selection of the cases, the 'most similar systems' design, described in section 3.2.2, is followed. Table 5.1 displays an overview of the criteria the selected cases will have to adhere to.

As shown in figure 5.2, Turner & Townsend is involved in all stages of project realisation. In each of these stages, disputes can arise. It is, therefore, important that the disputes arising in both selected cases occur in the same phase. The criterion that the project must have been executed in the last four years is derived from the paper by Parker (2020). He describes how the COVID-19 outbreak in 2020 led to an organisational

Table 5.1: *Case selection criteria and motivation.*

Criterion	Motivation
The projects need to be executed in the same industry	These factors need to be excluded as significant variables in the analysis (Przeworski & Teune, 1970).
The projects need to be comparable in terms of project type.	
The projects need to be comparable in terms of project size.	
The projects need to be comparable in terms of monetary value.	
The projects need to be comparable in the last four years.	
The projects need to follow similar procurement routes.	
Country of execution.	This variable indicates differences in culture, legal frameworks, and contractual frameworks, leading to different variable outcomes.

transition towards hybrid workspaces. In order for the cases to be as similar as possible, the projects have to be carried out after the COVID-19 outbreak so that the organisational requirements are aligned.

5.1.2 Introduction into the cases

Table 5.2 shows an overview of the selection criteria per case. Cat B fit-outs involves customising and furnishing an office space to meet the tenant's specific requirements. It transforms the base Cat A fit-out into a fully functional and customised workplace. A Cat A fit-out refers to the standard, finished condition of an office space provided by the landlord, which includes essential infrastructure and finishes required for occupancy. In contrast, Cat B fit-outs focus on aesthetics and branding, incorporating interior design elements such as wall coverings, flooring, bespoke joinery, and other features aligned with the tenant's vision and corporate identity. These fit-outs are usually carried out and paid for by the tenant, with the landlord's approval.

The project size and monetary value are of the same order of magnitude and, when converted, correspond to a value of EUR 1723/sqm for case A and EUR 1408/sqm for case B. The monetary value consists of the construction costs as well as the professional fees paid by the client for the entire project. Both clients of the projects are companies with office locations all over the world.

The traditional procurement route refers to the fact that the client initially enters into a contract with an independent designer (i.e. an architect) and possibly other consultants for the design of a project (Chao-Duivis et al., 2018). This means that the client has the final responsibility for the design. An orthodox tendering procedure is often associated with the traditional procurement approach, emphasising competitive pricing and a clear distinction between the responsibilities of designers and contractors (RICS, 2024). In case the traditional procurement route is chosen in the Netherlands, the Uniform Administrative Conditions for the Execution of Works and Technical Installation Works 2012 (UAC 2012) are most commonly used (Chao-Duivis et al., 2018). In the United Kingdom, there is a wide range of suitable contracts available for the employer to appoint a contractor if the traditional procurement route is chosen (RICS, 2024). Office fit-outs are classified as part of the mainstream commercial construction market, which projects are often constructed under Joint Contracts Tribunal (JCT) contracts (RICS, 2024).

Description case A

Case A is an office relocation and Cat B fit-out located in the Netherlands, constructed under the UAC 2012 for client X. The project was constructed by contractor Y and the design was developed by architect Z. The lease of the client's previous office expired and was terminated and therefore they had to move to

Table 5.2: *Case criteria per selected case.*

Criterion	Case A	Case B
The projects need to be executed in the same industry.	Commercial real estate	Commercial real estate
The projects need to be comparable in terms of project type.	Office relocation and Cat B fit-out	Office relocation and Cat B fit-out
The projects need to be comparable in terms of project size.	2,350 sqm	4,890 sqm
The projects need to be comparable in terms of monetary value.	EUR 4.1 million	EUR 6.9 million
The projects need to be comparable in the last four years.	2024	2023
The projects need to follow similar procurement routes.	Traditional	Traditional
Country of execution.	The Netherlands	England

a new location. The office moved into a single floor of an existing building with a Cat A label. Turner & Townsend was hired to assist the client to manage the project, as the client did not have the capacity to do so itself and lacks the technical knowledge needed to make certain decisions. Turner & Townsend was hired by the client to take care of project and cost management and the communication from the client to the other parties to ensure that the client had to spend less time on the project. Turner & Townsend did not have any previous experience working with this client. Contractor Y and architect Z were parties that Turner & Townsend did had previous work experience with.

Figure 5.3 displays the Dutch culture, based on Hofstede's cultural dimension theory (The Culture Factor Group, 2023). The Netherlands scores low on the power distance dimension, emphasising independence, equal rights, and decentralised power structures. Hierarchy is seen as a matter of convenience, and managers adopt a coaching style, empowering their teams and relying on their expertise. Communication is direct, participative, and informal, with employees expecting to be consulted on decisions. With a perfect score for individualism, the Dutch culture is highly individualistic. People value a loose social framework in which individuals are expected to look after themselves and take responsibility for their own life. Employer-employee relationships are seen as contracts based on mutual benefit. Management focuses on the individual, and social norms emphasise personal responsibility and self-reliance. The Netherlands has a feminine culture, which values a good work-life balance. Equality, solidarity and inclusiveness are central to the workplace culture. Managers strive to build consensus through involvement and support, and conflicts are resolved through negotiation and compromise. Decision-making often involves lengthy discussions to ensure that all voices are heard. The Dutch culture shows a slight preference for avoiding uncertainty. While the culture values a certain degree of rules and structure, there is room for flexibility and adaptability as well. Punctuality, precision, and a focus on hard work are valued, but innovation may experience resistance. Security remains an important motivator for individuals within this cultural framework. The Netherlands is long-term orientated and tends to prioritise sustainable solutions, future-proofing, and continuous improvement. The Dutch culture scores high on indulgence. An indulgent society is one that values the satisfaction of human needs and desires, whereas a restrained society sees the value in curbing one's desires and denying oneself pleasures in order to conform more closely to societal norms.

Description case B

Case B is an office relocation and Cat B fit-out located in England, constructed under the JCT SBC/XQ for client D. The project was constructed by contractor E and the design was developed by architect F. The company decided to merge two existing offices into one and moved into a single floor office of an existing building with a brand new Cat A. Turner & Townsend was hired to fully represent the client to do the project and cost management and take of all communication between them and external parties. Turner & Townsend did not have any previous work experience with this client. Contractor E and architect F were

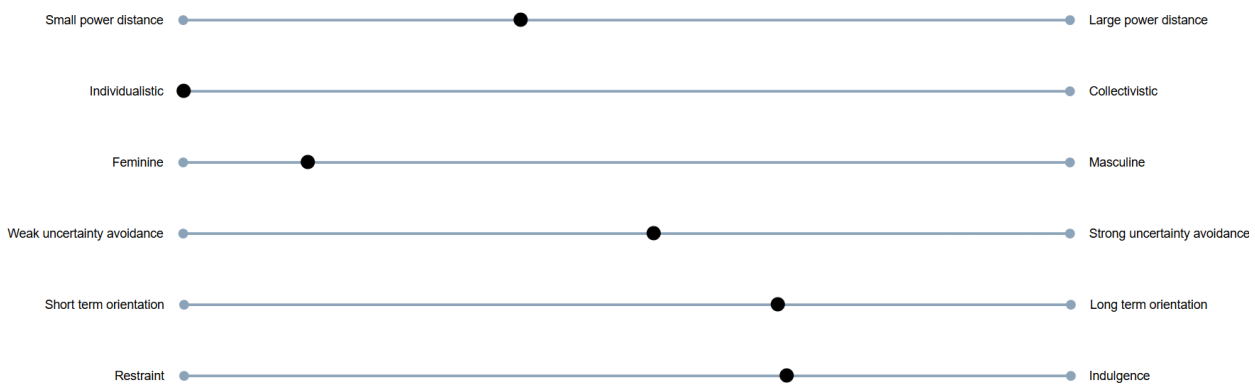

Figure 5.3: *The Dutch culture placed on Hofstede's cultural dimensions (The Culture Factor Group, 2023).*

parties that Turner & Townsend did had previous work experience with.

In figure 5.4, the UK's culture is placed on Hofstede's cultural dimensions (The Culture Factor Group, 2023). With a low power distance score, British society values minimising inequalities between people and emphasises fair play. A sense of equality underpins social interactions, with the expectation that people should be treated fairly. The UK encompasses a highly individualistic society. Privacy, personal fulfilment, and self-expression are valued, encouraging individuals to discover their unique purpose and contribution to society. Personal happiness is seen as closely linked to self-realisation. The UK places well over halfway towards masculinity, being a highly decisive and success-driven society. There is an underlying sense of ambition and achievement. The UK's low uncertainty avoidance score suggests a flexible and adaptable approach. In the workplace, low uncertainty avoidance leads to shorter planning horizons and smooth processes, with a strong focus on innovation and creativity. The UK is long-term oriented and values long-term benefits. As an indulgent society, the UK values the satisfaction of human needs and desires.

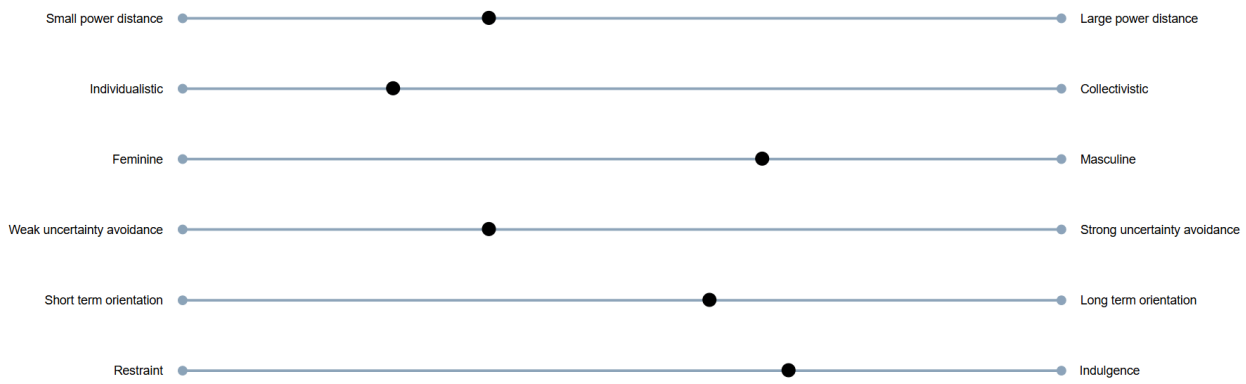

Figure 5.4: *The United Kingdom's culture placed on Hofstede's cultural dimensions (The Culture Factor Group, 2023).*

5.1.3 Interview set-up

The interviews that were conducted were semi-structured. Bryman (2016) describes the semi-structured interview as allowing for more of the interviewee's perspective, compared to structured interviews. The flexibility and focus on elaborate and detailed responses makes this type of interview the most appropriate strategy for this research. To set some boundaries and structure the questions to prevent the interview from going into topics irrelevant to the research, an interview protocol is developed, provided in Appendix C. The interview set-up is based on the literature review discussed in chapter 4 and is divided in four

parts: general information, dispute resolution, digitalisation, and effectiveness and efficiency. In the first part, general information about the interviewee's work experience an their role and scope of their work is obtained. The second part is focused on their experiences with dispute resolution. In the third part, questions are asked regarding their experiences with and views on digitalisation of the dispute resolution process. Lastly, the interviewees are asked about their thoughts on effectiveness and efficiency of the dispute resolution practices. Culture was deliberately excluded from the interview questions, as it was expected that the interviewees would not have sufficient knowledge of the concept in the context of this research. The way in which culture manifests itself in practice is therefore derived from the information provided in the interviewees' answers.

When potential participants were contacted, a brief description of the reasoning and purpose of the study and the information sheet for the interviews, including the informed consent form, were sent along with the interview guide. These can be found in Appendix D and E respectively.

5.2 Execution

In this section, the execution of the empirical research is described. First, per selected case, the facts of the case studies are presented in the in-case analysis using empirical evidence retrieved from the interviews. As described in the previous section, the interviews were divided in four parts. The latter three parts, dispute resolution, digitalisation, and effectiveness and efficiency, form the guidelines for the in-case analyses. The in-case analysis is mainly focused on the function- and role-specific culture, by revealing each stakeholders' interests in a project. Also, by exploring the services offered and scope of the interviewees' works, the organisational culture is partly explored. Next, the two cases are compared in the cross-case analysis, forming the basis for answering the main research question. The cross-case analysis covers part of the organisational culture by exploring how services are offered within the companies, as well as the national culture by revealing differences and similarities between the two countries. In Appendix F an overview of the interviewees is given.

5.2.1 In-case analysis case A

In this case, the project manager assisted initial contact with the external parties. Contact with these parties was very low-key and all were enthusiastic to be part of the research. Five people were interviewed for this case: the project manager, the cost manager, the client, the contractor, and the architect. The processed interviews of this case study can be found in Appendix G.1.

Dispute resolution

In the interviews, it frequently emerged that miscommunication (Appendix G.1.1, G.1.3, and G.1.4) or ambiguities of contractual documents (Appendix G.1.4) are significant factors in the occurrence of disputes. In this project, there was a lack of clarity on the contractor's part regarding what was expected of them based on the tender request. Normally, under the traditional procurement route, the complete design is created by the client's appointed party, the architect, and once the design is finalised, it is executed by the contractor. However, in this project, a 'design-and-build' approach was chosen, which in this case meant that the contractor would be responsible for delivering the technical design. Typically, in the Dutch construction industry, a design-and-build contract refers to an integrated contract, also known as the UAC-IC 2005 (Chao-Duivis et al., 2018).

According to the contractor, they were not informed that they were responsible for providing the technical drawings (Appendix G.1.4). This was, however, known to the architect and the project manager also emphasised during the interview that this should have been clear to the contractor (Appendix G.1.1 and G.1.5). The client commented on this issue as follows (Appendix G.1.3, question 2c):

'We assumed that all the information was known to the contractor after the design was delivered to them. However, they reported to us that that was not the case. They were missing those technical drawings. We

just could not have known this because we do not have the technical expertise to judge that the design is complete.'

This quote highlights an important aspect consistently mentioned across the interviews. The client lacks the technical knowledge to assess the project's technical aspects. This is a key reason why the client initially hires a project manager, namely to translate technical details into their impact on the client's interests (Appendix G.1.1 and G.1.3).

The fact that clients are often unaware of the impact of scope changes causes friction between the contractor and the client (Appendix G.1.1). In this case, the contractor unexpectedly had to deliver technical drawings, causing delays to the project, which neither the client nor the contractor had anticipated. Both parties aim to stay within their respective schedules and budgets. However, the contractor faces additional stress due to the contract's penalty clauses, which specify fines the client can impose if certain obligations, such as deadlines, are not met. The significant financial impact of these penalty clauses increases the contractor's time pressure to complete the project within the agreed guidelines and are more aware what exactly is stated in the contract and what they can and cannot do within its guidelines (Appendix G.1.1 and G.1.4).

In the interview, the project manager commented the following (Appendix G.1.1, question 2c):

'The biggest cause of the problems was the time pressure everyone felt.'

The interviews made it clear that time pressure was the most significant underlying factor in all disputes. Every party wants to stay within their set budget and timeline and is exposed to risks when these are exceeded. It also became evident from the project manager's interview that time pressure strongly influenced the behaviour of the parties involved in the dispute. The accumulation of issues eventually caused communication between the client and contractor to break down to such an extent that it appeared the project could no longer be completed. To restore normal and friendly communication, human interaction was essential (Appendix G.1.1). All parties agreed that this was the only right way to move the project forward (Appendix G.1).

In all interviews, further questions were asked about the exact role the contract played in resolving the dispute. In the interview with the project manager, it was mentioned that the extent to which the contract is explicitly consulted depends heavily on the type of company. The client stated the following about how dispute resolution is approached (Appendix G.1.3, question 5b):

'Initially, disputes are resolved in mutual consultation in which we try to find a solution. The costs of this are then determined, and then we look at what is stated in the contract.'

The client clearly indicates here that the contract is not the first point of reference when resolving a dispute; instead, an initial joint discussion is held to explore possible solutions. The project manager expressed a similar view, stating that no fixed methods are followed to resolve disputes, but rely more on intuition (Appendix G.1.1). The cost manager also provided a clear perspective on how dispute resolution typically operates in the Netherlands (Appendix G.1.2, question 2a):

'Things in the Netherlands are a lot less contractual than they are in the UK.'

Additionally, the cost manager mentioned the following (Appendix G.1.2, question 5b):

'In the Netherlands there is this culture of trust, fairness, and the friendliness of it all. But I don't think it's the same in the UK.'

This quote clearly reflects the principle of reasonableness and fairness in the Dutch (contract) law. The architect added that in cases where the cause of an error is clear, these issues are easy to trace back in the contract documents. The most difficult disputes to resolve are those that arise from an accumulation of various factors (Appendix G.1.5). In such cases, a solution is reached jointly and the contract is included in the considerations. It is evident from all interviews that they emphasise the importance of considering everyone's interests and examining the broader context when resolving disputes.

The key points mentioned by each interviewee are summarised in table 5.3.

Table 5.3: *Key takeaways on dispute resolution per interviewee case A.*

Interviewee	Key takeaways
Project manager	Considering everyone's interests, good communication is key. Time pressure is the underlying factor for all behaviour, considerations, and methods depending on the project.
Cost manager	Considers what is stated in the contract.
Client	Needs an external party to translate technical aspects, focuses on staying within budget and schedule, and values open communication.
Contractor	Important to stay within the timeline, time is of the essence. Timely communication and reporting are key.
Architect	Observes from the sidelines and provides a supportive role when necessary.

Digitalisation

The first observation during the interviews and the analysis was that all parties interpreted the question about their experience with the digitalisation of the dispute resolution process (question 3a, Appendix C) differently from its original intent. The question aimed to explore their experience with the digitalisation of the entire process, but the interviewees understood it as referring to a digital tool that supports the process. A second observation was that the answers primarily focused on how digitalisation would impact documentation and reporting, and consequently, the way communication is handled. Most interviewees have experience with non-automated digital tools, such as a Teams environment or SharePoint, where documents are uploaded and shared with the appropriate parties. Automated programmes are rarely used in these types of projects. In the interview with the project manager, it was noted that if automated programmes were to be used, it is often initiated by the contractor (Appendix G.1.1). The contractor emphasised the importance of recording both progress and follow-up actions for all parties. By using a central digital platform, everything would be documented in real-time, giving all parties access to all documents at any time, which would enhance project transparency (Appendix G.1.4). However, the architect mentioned that having access to all documents is not relevant for them, as they are only involved with the design elements pertinent to them. They noted that access to all documents might be overwhelming and cause them to lose focus (Appendix G.1.5).

A second aspect strongly highlighted in the interview with the contractor was the focus on time efficiency. Increased transparency and clarity about follow-up actions could accelerate the entire project, as it would be clear which party needs to act and when (Appendix G.1.4). The client, however, had a distinctly different perspective. In their interview, the client shared their experiences of working with BIM. They described how, as the client, they had to approve dozens of technical aspects of the design daily to ensure clarity and prevent misunderstandings about approved design pieces. The interviewee explained how they lacked the technical expertise to make valid judgments and did not understand the implications of approving these technical components for later stages of the project. This caused significant stress, as the client felt flexibility was reduced. The client said the following about this (Appendix G.1.3, question 3a):

'In the long run, we also formed some reluctance to approve things, to increase the flexibility of the design. On the other hand, we couldn't, because otherwise we would slow down the process. This caused a lot of stress.'

In the interview, the client proposed an alternative approach to the use of BIM. Instead of making them responsible for approving technical aspects, the technical information could remain between the contractor and the architect, with the project manager keeping the client informed. This way, the client would not have to take responsibility for decisions they lack the knowledge to make (Appendix G.1.3).

All parties agreed that digitalisation improves the clarity of communication. Currently, most communication takes place via email, with periodic meetings to discuss progress and other matters. In the event of a dispute, emails must often be searched to determine when agreements were made and recorded (Appendix G.1). Most

parties agreed that this can be a time-consuming task and that digitalisation could make documents and other information more easily accessible when needed. This, in turn, would make decisions and solutions easier to substantiate (Appendix G.1.1). Only the cost manager did not necessarily see the added value of digitalisation, other than email correspondence, of the resolution process in these type of smaller contracts (Appendix G.1.2).

The project manager also mentioned an obstacle to digitalisation during the interview. In this project, emotions had escalated to such an extent that communication was no longer functioning. A suitable solution had to be found to address this. The project manager commented (Appendix G.1.1, question 3d):

'While looking for a solution, we had to take into account those feelings and the underlying thoughts behind them, so I don't know if a digital system works for that.'

The project manager thus indicated that a digital system alone cannot resolve disputes, but it can support the reasoning behind the resolution.

Finally, on the use of digital tools, the client said that it should be very well described contractually what the consequences are if a party does an approval in a digital system, which, in their view, is a disadvantage. The following was said about this (Appendix G.1.3, question 3d):

'As a client, but not only as a client, you want to map everything as well as possible, as quickly as possible, and as complete as possible. That is why you want to know all the risks in advance, and that is difficult to record in the contract.'

The key points from each interviewee are summarised in table 5.4.

Table 5.4: *Key takeaways on digitalisation per interviewee case A.*

Interviewee	**Key takeaways**
Project manager	Useful for supporting reasoning and solutions. A digital system cannot stand alone as it does not account for emotions and underlying thoughts.
Cost manager	Used only for correspondence to back up costs or changes.
Client	Improves clarity in communication and documentation but reduces flexibility.
Contractor	Improves clarity in communication and documentation, increases transparency, and accelerates the process.
Architect	Useful when relevant documents are always up-to-date; it is not necessary to have access to all other documents.

Effectiveness and efficiency

The client and the contractor agreed that dispute resolution is effective when, by the end of the project, they have remained within budget and on schedule (Appendix G.1.3 and G.1.4). The client further added that maintaining good relationships is also important and again mentioned that separating the technical information would enhance effectiveness and, consequently, efficiency for them.

The project manager views effective dispute resolution as reaching a solution collaboratively so that the project can proceed with its execution. Regarding improving efficiency, the following was commented (Appendix G.1.1, question 4b):

'I see efficiency as something that comes with experience. So, the more experience you have the more efficient the process is as well. I don't feel that the process in general needs to be more efficient.'

The cost manager and the architect agree with the project manager and mentioned that the current process does not require to be more efficient, it works well the way it does for these small-scale projects (Appendix

G.1.2 and G.1.5).

The contractor, however, would like to see efficiency improved in a way that reduces their dependence on actions performed by other parties (Appendix G.1.4). They would prefer actions to be carried out more in parallel rather than sequentially. However, this relates more to the overall project execution process than to the dispute resolution process specifically.

Something all parties agreed on was that digitalisation has increased the overview, and hence efficiency, of communications. Table 5.5 summarises the key takeaways on effectiveness and efficiency from the interviews.

Table 5.5: *Key takeaways on effectiveness and efficiency per interviewee case A.*

Interviewee	**Key takeaways**
Project manager	Collaboratively reaching a solution to ensure the project can proceed with execution.
Cost manager	Get the best value for the client.
Client	Meeting the schedule, staying within budget, maintaining good relationships, and keeping technical aspects separate.
Contractor	Meeting the schedule and staying within budget.
Architect	Ensure quality.

5.2.2 Conclusion case A

This in-case analysis revealed that the project manager, the client, and the contractor are the key parties involved in disputes and resolving them, and that negotiation is the most important method to do so.

The interview with the project manager highlighted that time pressure was the underlying factor influencing the behaviour of the parties involved in the dispute. This was particularly evident in organisations such as contractors, where there is significant pressure to complete the project within the set timeline, especially given the penalty clauses included in the contract. Additionally, it is important to involve a party capable of translating the impact of technical aspects from the contractor to the client, as the client often lacks this technical expertise. This helps prevent friction between these parties.

The interviews underscored the critical importance of communication in preventing and resolving disputes. The in-case analysis identified two aspects of communication: good communication and structured communication.

Good communication is crucial for preventing disputes. This includes ensuring that each party's responsibilities are clear, that the tender request includes all relevant information, and that it is evident when and what is expected from each party.

Structured communication relates to resolving disputes. All parties noted the value of a structured overview when problems arise. Such an overview allows relevant documents and other information to be easily accessed at the right moment, facilitating well-supported decisions and reasoning. This was particularly important for the project manager, who serves as an intermediary between the client and the contractor. While hired by the client, project managers understand that a project cannot proceed if a dispute remains unresolved. For this reason, they carefully consider the interests and underlying emotions and reasoning of all parties to arrive at an appropriate solution, functioning as a neutral party, or even a mediator. This reflects the principle of reasonableness and fairness in Dutch contract law. Precisely for this reason, the interviews emphasised the indispensability of the human element in dispute resolution. A fully digitalised resolution process would not be able to account for these feelings and considerations.

Regarding the effectiveness and efficiency of the resolution process, the primary focus was ensuring that the project could be completed within the set budget and timeline while maintaining good relationships.

5.2.3 In-case analysis case B

Establishing contact with potential participants was a found to be more difficult in this project than in the Dutch project. During the first contact with Turner & Townsend it became clear that it would not be possible to get into contact external parties. In the end, only the cost manager was interviewed for this case. However, to assist the answers given, an interview was also conducted with an experienced Turner & Townsend project manager with working experience both in the UK and the Netherlands. The processed interviews can be found in Appendix G.2 and G.3 respectively.

Dispute resolution

The first thing that came up in the interview, even before the first question was asked, was that the interviewee wanted to clarify what was meant when referring to 'disputes'. The following was mentioned about this (Appendix G.2.1, question 5a):

'We have the risk of impact on programmes, the cost risk, and the negotiations between that, but I am not sure if I would class that at dispute, since that is more day-to-day work. When there are disagreements or discussions we talk about "change management". When we talk about disputes, we refer to large-scale conflicts, and you think about litigation and other legal terms.'

When reaching out to potential participants, some resistance was encountered in participating in the research. In the case of the project manager, the reason given was that they had no experience with disputes or resolving them. Based on the cost manager's explanation in the quote above, the lack of experience with disputes can be explained due to the fact that in England a clear distinction between conflicts classified as disputes and those that fall under 'change management'.

The interview revealed that the change management process starts either when the client requests a change or when the contractor encounters a problem on site. This results in changes to the project that have an impact on costs. These changes are discussed during negotiations between the contractor and the cost manager. Once the cost manager and the contractor agree on the costs, the proposal is sent to the project manager for the client's approval of the impact on the programme and costs.

Other conflicts that typically arise involve situations where the contractor claims extra money because something was not shown on the drawings and therefore not included in their contract, while the designer argues that it was included. The project manager mentioned that, generally, when such conflicts arise, parties would go in quite aggressively with all relevant information and is quite quick to start throwing contractual clauses (Appendix G.3.1). The resulting conflict is about whether the issue constitutes a valid change or not, a decision that lies with the project manager. About this, the project manager also mentioned the following (Appendix G.3.1, question 2a):

'It's important to look at it case by case. Because sometimes just because you are right and the contract gives support, it doesn't mean you do it.'

This quote shows that, even though the contract is a very important aspect in dispute resolution in the UK, emotions are still accounted for in the decision-making.

Disputes can also arise during monthly progress meetings. At these meetings, the progress of the project is reviewed to ensure that the costs incurred match with the progress made. If they are not, a dispute arises and negotiations begin between the cost manager and the quantity surveyor working on behalf of the contractor to bring the valuation level into line with the work completed on site. The project manager revealed that these quantity surveyors and the contractors in the UK are very familiar with the contracts and use this in their advantage (Appendix G.3.1). Also, the cost manager mentioned that in these negotiations, it is important to make a fair and reasonable assessment, as delays in progress are not always due to the contractor, but may be due to unforeseen circumstances.

Overall, the cost manager primarily deals with conflicts with the contractor regarding costs, whereas the project manager is mainly assessing different situations and responsible for the decision-making. In table 5.6 the key takeaways on dispute resolution are given.

Table 5.6: *Key takeaways on dispute resolution case B.*

Key takeaways
The contract is important to substantiate information, but fairness and reasonability are also important in negotiations.

Digitalisation

In the interview with the cost manager, it was mentioned that the change management process is almost entirely digitalised. It was explained that a weekly email was received with an up-to-date overview of all costs, which was then emailed back to the contractor with comments after being reviewed. Following this, a meeting would be held to go through everything together and reach an agreement. This agreement would also be documented via email, creating a fully digital audit trail. The cost manager said the following about these digital audit trails (Appendix G.2.1, question 3b):

'The audit trail is important to have to show the client where change and cost agreements came from when they ask for it.'

These audit trails were also used as a reference point when the parties disagreed on certain changes. The following was said about this (Appendix G.2.1, question 3b):

'It is useful to have digital audit trails, but sometimes I feel like it is better to have in person interaction as you can lose human interaction when doing negotiations via Teams. I think it is also quite important in dispute resolution to be able to have a human connection with someone if you want to get on with them. I think digitalisation can take the human connection away.'

From the two quotes above, it is clear that digitalisation has improved reporting and works well for creating an audit trail. This is found to be useful for referencing when parties are in conflict over agreements made. However, maintaining human connection during negotiations is important for fostering good relationships. The project manager said the following about these relationships (Appendix G.3.1, question 5e):

'The bigger the projects, the less involved you are with stakeholders. In smaller projects you have a lot more contact with the stakeholders, and the relationship is more informal. So, because you work more closely, maintaining good relationships is important.'

Maintaining good relationships is thus very important, especially in small projects.

In the interview, the cost manager mentioned another barrier to digitalisation and creating an audit trail (Appendix G.2.1, question 3d):

'As a cost manager I spend a lot of time to data input, rather than actual cost managing, so the input of data could be more efficient. An AI-tool could be a suitable method for this, but we can't put the data through an external AI-tool due to confidentiality.'

This highlights areas where there is still potential for improving the digitalisation of the resolution process, as seen from the cost manager's perspective. The key takeaways on digitalisation are displayed in table 5.7.

Table 5.7: *Key takeaways on digitalisation case B.*

Key takeaways
Digital audit trails are important to substantiate choices made, but data input is time-consuming. Digitalisation can take the human connection away in dispute resolution, but maintaining good relationships is important.

Effectiveness and efficiency

In the interview, it was mentioned that the cost manager believes that the current change management process with the contractor works well, provided it is done correctly. If not, there can be confusion about which documents are the most up-to-date. The cost manager commented (Appendix G.2.1, question 4a):

> *'I think effective dispute resolution is having clear structured to how a dispute is raised, assessed, dealt with, agreed, and instructed. By having milestones and proper dates for certain deadlines the work gets streamlined, which makes the process of reviewing documents effective.*

The cost manager also emphasised that they want to get the best value for the client, and added that having a human connection in dispute resolution is important in dispute resolution in order to get on with people in the negotiations.

An important aspect mentioned regarding the efficiency of digitalisation was that, as a cost manager, a significant amount of time is spent on data input to create a digital audit trail, rather than on actual cost management. Therefore, finding an alternative for this data input process would be valuable.

The project manager added that giving the opportunity to let people give their open and honest opinion is important for effective dispute resolution (Appendix G.3.1).

A summary of the key takeaways on effectiveness and efficiency are listed in table 5.8 below. Since the perceptions of the project manager and the cost manager are quite different, a distinction has been made of the key takeaways per interviewee.

Table 5.8: *Key takeaways on effectiveness and efficiency per interviewee case B.*

Interviewee	**Key takeaways**
Project manager	Conduct an open and honest discussion.
Cost manager	Following a well-structured process, get the best value for the client, and maintaining good relationships makes dispute resolution effective. Efficiency of data input for creating an audit trail may increase.

5.2.4 Conclusion case B

In this case, the focus was primarily on how disputes are resolved once they have occurred. It was less clear what measures are taken to prevent disputes from arising. Negotiation was found to be the most important method to come to an agreement.

Digital audit trails, created via email, serve as a reference that can be used to substantiate certain decisions and changes. According to the cost manager, the current change management process works well, but the main improvement lies in the efficiency of data input for creating digital audit trails. Currently, a significant amount of the cost manager's time is spent on data input rather than actual cost management. An external AI-tool cannot be used for this due to confidentiality issues.

Additionally, it became clear that a fair and reasonable assessment is conducted to reach decisions, and that a human factor remains necessary in dispute resolution to maintain good relationships.

5.2.5 Cross-case analysis

In this section, the differences and similarities between the two cases are assessed, which will reveal the influences of the national and organisational cultures. Figure 5.5 compares Hofstede's cultural dimensions of both cases. The two countries both have a small power distance, which means that both countries value equality and fair treatment of people. Both countries are individualistic, but the Netherlands show

a more extreme value. Change initiatives must align with employee values and ethical norms rather than top-down structures. The two countries show a significant difference in femininity and masculinity. The Netherlands has a feminine culture, in which conflicts are resolved through negotiation and compromise and decisions are taken using collaboration and consensus-based approaches. The UK is masculine and are highly decisive and results-driven. On uncertainty avoidance the views of both countries are different as well. The Netherlands have a small preference for uncertainty avoidance, whereby resistance can be experienced towards innovation and novel situations should be structured through rules. The UK has a low uncertainty avoidance and has a strong focus on innovation. It is important to note the contradiction that seems to exist within this dimension. A high level of uncertainty avoidance, according to the literature, does indeed indicate an intolerance of new ideas - or innovation - but also a generally strong regulation of laws and rules (Żemojtel-Piotrowska & Piotrowski, 2023). Looking at what is described in section 4.2.2, the Dutch legal system actually allows for weaker regulation. The same contradiction seems to prevail in the UK. In cultures with low uncertainty avoidance, there is typically a tolerance for innovation and less regulation. However, as described in section 4.2.3, the English legal system is highly regulated and places a great emphasis on facts. Furthermore, the two cultures show quite similar scores on long-term orientation, which refers to a cultural preference for planning and investing in the future rather than focusing on immediate results. The scores of indulgence are very similar as well. Both countries value the satisfaction of human needs rather then withholding them to align more with societal norms.

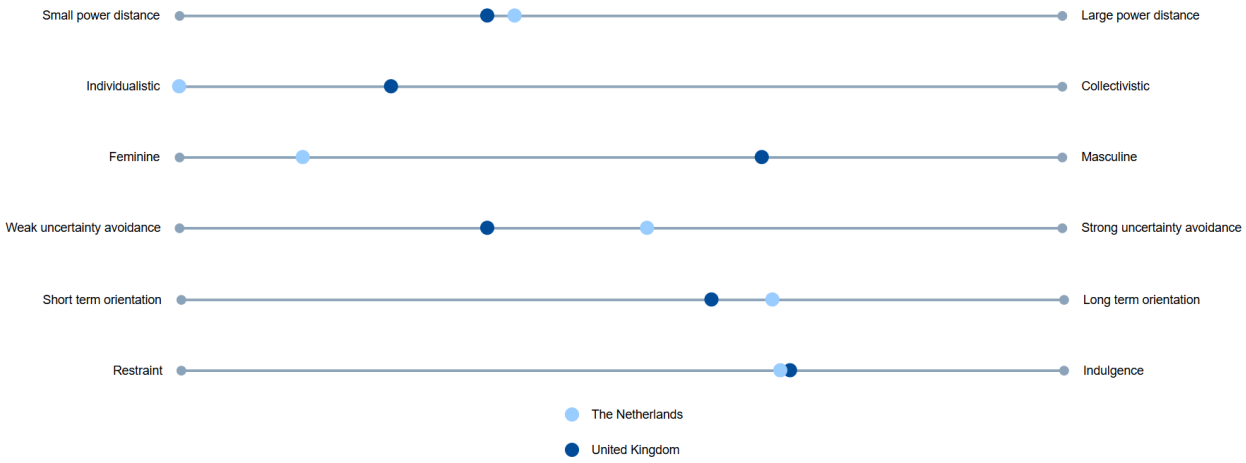

Figure 5.5: *Cross-case comparison of Hofstede's cultural dimensions, based on The Culture Factor Group (2023).*

Now, the two cases are compared, following the latter three parts used in the interviews. Note that the project manager which has been consulted for case B is referred to hereinafter as the 'general project manager', to prevent confusion with the actual project manager of case B - who has not been interviewed - and the project manager of case A.

Dispute resolution

The first difference that emerged from the dispute resolution interviews was the different understanding of the term 'dispute'. In case B, the cost manager clarified at the beginning of the interview what was meant by the term 'dispute' in the UK. A clear distinction was made in this interview between 'dispute resolution' and 'change management' (Appendix G.2.1). Of the interviewees in case A, only the cost manager made a distinction between disputes and conflicts (Appendix G.1.2). It is important to note that the cost manager in case A is British and has six years experience of working in the UK. The interviewees of British origin seem to attach greater value to the terminology compared to people in the Netherlands. This is also reflected in the structure of the legal systems and the contracts and their application. In the interviews with the cost manager from case A and the general project manager, it was mentioned that the Netherlands is significantly less contractual than the UK (Appendix G.1.2 and G.3.1). The UAC 2012 is a relatively small contract and gaps are filled by laws embedded in the Dutch legal system (Appendix G.1.2). The principles of reasonableness

and fairness play an important role and there is a culture of trust between different organisations (Appendix G.1.2). The general project manager added the following to this (Appendix G.3.1, question 5c):

'In the Netherlands they don't think it's normal to put damages in the contract. Because it feels like it sets off the contract in the wrong way. In the UK you would be crazy if you would recommend going into a construction contract without damages.'

The interviews in case A revealed that in the event of a dispute, an initial joint discussion takes place to find a solution, after which the contract is consulted. The general project manager added to this that the Dutch are much more keen to resolve things without the contract (Appendix G.3.1). This interviewee also mentioned that Dutch contractors get shy and uncomfortable around contractual issues, whereas contractors in the UK know contracts inside and out and are quite quick with throwing around contractual clauses (Appendix G.3.1. This came forward in case B as it was discussed that the contract was consulted first and a decision was made on the basis of this (Appendix G.2.1). The cost manager in case A and the general project manager also emphasised that JCT contracts are very detailed and can be used almost as a guidebook (Appendix G.1.2 and G.3.1), which is in line with the comprehensiveness of the common law.

Another difference that emerged from the interviews was the role of a cost manager. In the interview with the cost manager in case A, it was mentioned that a cost manager is not a generally recognised function in the Netherlands, whereas in the UK it is (Appendix G.1.2). It was also noted in this interview that, in the Dutch market, clients generally trust contractors to submit reports that accurately match reality. The interviewee showed considerable non-understanding that the concept of a cost manager representing the client is not commonly recognised in the Netherlands. This lack of inherent trust can again be linked to the British background of the cost manager. It also highlights an important organisational characteristic, as Turner & Townsend is a company of British origin that explicitly offers cost management services, which distinguishes it from many comparable Dutch companies.

In both cases, it was evident that when making decisions or resolving disputes, considerations extend beyond just the facts, taking the broader context into account. However, this appeared to be to a lesser extent in case B than in case A. This reflects the emphasis on reasonableness and fairness in the Dutch legal system and the hybrid form of the parol evidence rule, as described in sections 4.2.2 and 4.2.3.

A key insight from both cases was the significant role of the project manager in decision-making regarding appropriate solutions for disputes and in translating the contractor's technical requirements to the client. For this reason, it is crucial for organisations that offer project management services to have access to relevant information and maintain a clear overview of all data.

Digitalisation

The interviews from both projects revealed that digitalisation, in the form of email correspondence and the ability to hold online meetings with various parties on short notice, is a significant asset for effective communication. However, beyond these aspects, digitalisation was rarely used in the dispute resolution process. In the interview with the general project manager it was described that the reason digital technologies such as BIM are generally not used is because of the intangibility and the associated costs (Appendix G.3.1). A notable observation was that, in the interview with the cost manager from case B, it became clear that Turner & Townsend is actively developing an internal change management platform and an app with a client portal, whereas this was not an issue in the Dutch project.

Both projects also highlighted that the dispute resolution process cannot be fully digitalised, as human interaction remains essential, especially in small projects. This is not only important for maintaining good relationships, but also because a digital system cannot take into account emotions and the underlying thoughts behind them.

Effectiveness and efficiency

There were no clear differences in the perspectives on the effectiveness and efficiency of the dispute resolution process between the two cases. In both cases, it was essential that the project was completed within the set budget and timeframe, while maintaining good relations. Additionally, it was noted that clear and structured communication is crucial for easily retrieving relevant information to substantiate advice or decision-making.

A specific concern raised by the cost manager in the English project is related to the efficiency of data input for the internal change management platform. As this data input is currently done manually, it is very time-consuming. One potential solution would be to automate the data input. However, due to confidentiality regulations, it is not permitted to process the data through an external tool. Such confidentiality regulations are commonly observed in companies and set boundaries on the extent to which digital tools can or may be used within those organisations.

6. Findings and validation

In this chapter, findings that are derived from the empirical research and the process of validation are presented. The findings are established by combining the interview data and other empirical data with the conceptual framework. Links between the different data sources are assessed and possible explanations are given. Based on the findings, a number of statements have been developed that were used in the validation. The findings combined with the data from the validation serve as the basis for the conclusions.

6.1 Findings

In the empirical research, it emerged that identifying the root cause of conflicts, as done by Cheung and Pang (2013), can be used to highlight and resolve clear mistakes. However, in the case of disputes, it is nearly always the case that it involves an accumulation of basic events, and, more importantly, how these are subsequently dealt with. Finding the root cause is therefore not necessarily the first and most important step in resolving a dispute. There is much more at play than just the facts. The interests and emotions of various stakeholders influence both the approach and the outcome of dispute resolution. This finding reflects the interaction between the components 'construction project disputes' and 'successful implementation of dispute resolution methods' on the right-hand side of the conceptual framework, as it shows that dispute resolution practices are partially dependent on the interpretation of dispute causes. This interpretation is dependent on the stakeholders preferences and interests, which, in turn, are determined by the left-hand side of the conceptual model.

Throughout the empirical research, it was repeatedly emphasised that dispute resolution methods other than negotiation were rarely used to resolve disputes in small projects. Exploratory conversations revealed that this was mainly due to the costs associated with other methods. In the interviews, various stakeholders indicated that dispute resolution was considered effective if the project remained on budget and on schedule, while maintaining good relationships. Maintaining these good relationships was another key reason that negotiation is a preferred dispute resolution method, particularly in small projects. These aspects of high cost and hostility are consistent with the literature review which describes that ADR methods were initially developed to reduce these aspects, see section 4.3.2.

Although negotiation was the preferred method of dispute resolution in both case studies, there were some differences in the way these negotiations were conducted, which can be used to explain how these differences can influence the digitalisation of the dispute resolution process.

A first observation is that the role of the national culture and the regulative pillar is very significant in shaping the mindset and behaviour of stakeholders. Since national culture and the regulative pillar determine the structure of the legal system, it is subsequently reflected in associated norms, such as the importance of reasonableness and fairness and considering the broader context, or, conversely, valuing structure by emphasising literal wording and established agreements in contracts. A concrete example of this from the case studies was that in the Dutch project, in the event of a dispute, an initial joint conversation would take place in order to find an appropriate solution, followed by consultation of the contract. In the English project it was the other way round.

The structure of the legal system explains not only how and when contracts are used, but it also explains people's attitudes towards the digitalisation of dispute resolution. In section 5.2.5, it was noted that there seemed to be a contradiction between the classification of both cases on the cultural dimension of

uncertainty avoidance and the actual behaviour of individuals in the projects. The Netherlands is classified as uncertainty avoidant, which, according to Żemojtel-Piotrowska and Piotrowski (2023), means that there is a strong regulation and intolerance for new ideas. However, in the literature review, it was found that the Dutch legal system is consensus-based, has a focus on reasonableness and fairness, and allows contractual clauses to be interpreted beyond the text, taking into account the context. The empirical research shows that in case A, there was a significant emphasis on joint conversations, resolving issues through negotiation and compromise to ensure that everyone's interests are considered when a decision was made, which reflects the findings of the literature review. This last observation also reflects the femininity of the Dutch culture.

The same contradiction was found in case B. The UK is classified as low in uncertainty avoidance, meaning that regulation is weak and there is a high tolerance of new ideas. However, section 4.2.3 described how the English legal system is highly extensive and detailed, with a significant emphasis on the precise wording of laws and contractual clauses. In other words, regulation is strong. The empirical research found that, in case B, the first step to resolving a dispute was to examine what was stated in the contract, focusing on the facts, reflecting the UK's masculine culture.

Minkov and Kaasa (2022) discuss that the correlates of the dimension of uncertainty avoidance are unclear and not evidenced. Therefore, these observations have led to the following finding. The cultural dimension of uncertainty avoidance is subdivided into two behavioural traits when it comes to digitalisation of dispute resolution. These subcategories are strong versus weak contract regulation and the attitudes towards innovation. The first subcategory reflects the structure of the legal system. The Dutch legal system is consensus-based and allows contracts to be interpreted considering the wider context of the entire document and societal norms, emphasising the principles of reasonableness and fairness. In dispute resolution, strict regulation of the exact content of contracts is, therefore, weaker. This weaker regulation reflects the feminine behaviour of the individuals in case A. Combining the structure of the Dutch legal system and the feminine behaviour explains the resistance towards innovation - in this case digitalisation of dispute resolution - as described in section 5.2.5. Emotions are used strategically in the negotiations and compromises are made in order to resolve the dispute. Digitalisation of the dispute resolution process would reduce or eliminate these aspects, which explains the resistance towards innovation. In England, contract regulation is strong. The empirical research showed that contracts and facts are important aspects of dispute resolution. The strong regulation of contracts reflects the masculine culture of the UK. Masculine cultures are highly decisive and result-driven. Again, the combination of the structure of the legal system and masculine behaviour can explain attitudes towards the digitalisation of dispute resolution. As the English building industry is contractually oriented and focused on factual issues, stakeholders are more receptive to technical systems for dispute resolution, reducing bias and speeding up the process.

Another national cultural difference in the negotiations approach that was found relates to the involvement of a cost manager. In the interview with the cost manager of case A, it was mentioned that a cost manager is not a generally recognised role in the Dutch construction industry. The explanation given was that companies in the Dutch market generally have greater trust in each other and assume that there is no need for a separate role to manage costs. Turner & Townsend is a company of British origin which offers separate cost management services as part of their organisational culture.

Another aspect of the organisational culture that has an impact on the use of digital tools in dispute resolution is a company's confidentiality policy. In the interview with the cost manager of case B, it was mentioned that data input for the internal change management portal could be more efficient. However, it was also pointed out that this could not be done using an external AI-tool, as it would breach the company's confidentiality regulations. Thus, the organisational culture sets the boundaries for how (external) digital technologies can be used, which reflects the regulatory pillar within this institutional level.

The interviews revealed that the only digital technologies used in dispute resolution for small projects were email correspondence and Teams, for hosting online meetings. The use of email communication automatically creates a digital audit trail that can be used to retrieve relevant information when needed. Teams was used to facilitate meetings on short notice. Overall, this process was found to be working well the way it did. However, it was mentioned several times that it can be time consuming to find relevant information at the right time and that it might be valuable that a better overview is created for this purpose.

In the interview with the general project manager, an explanation was given why digital technologies

other than email and Teams are not used generally (Appendix G.3.1). It was described that the technology is intangible and stakeholders do not understand the benefit of using it. Another reason given was the costs that are associated with the use of technologies such as BIM. These restraints are determined by both the organisational and role-specific cultures.

When asked about the stakeholders' views on the full digitalisation of the dispute resolution process, the responses were negative. Several interviewees stated that maintaining human interaction in the dispute resolution process is essential to reach an appropriate solution. This is linked to the fact that resolving a dispute is not only about the facts or the causes that have occurred, but also about how situations are dealt with. This is where emotions play an important role.

The project manager of case A mentioned that the underlying cause of the dispute in this project was the stress experienced by the parties due to exposure to (time) pressure. In various interviews, it was highlighted that it is crucial for the parties to keep a project within budget and on schedule. When there is a risk of deviation, the parties experience a sense of pressure, which can lead to stress-induced actions such as negatively affected interpretations of information and behaviour or rushed decision-making. A digital system would not be able to account for these emotions and the underlying thoughts behind them and can thus not fully replace the human connection in dispute resolution.

The empirical research also highlighted the extend of the parole evidence rule in case B. The literature review discussed that a hybrid form of this rule is now commonly applied, see section 4.2.3. The fact that the culture of the UK is categorised as masculine in combination with the observations of the empirical research can explain the hybrid form of this rule. Since the UK classifies as masculine, it is highly decisive and result-driven, which explains why there remains a strong focus on the exact content of a contract and why this continues to be the default mechanism for resolving disputes. A related observation was that the interviewees with a British background placed more emphasis on the terminology of the term 'dispute' than those with a Dutch background. However, in the interview with the cost manager of case B it was also noted that context is seen as an important aspect in dispute resolution in small projects. Combining the masculine character of the UK with these observations reinforces the findings of the literature on the hybrid form of the parole evidence rule and the rise of reasonableness and fairness.

These underlying thoughts and emotions are an example of how the cultural-cognitive pillar takes shape in dispute resolution practices. Digital technologies may effectively make assessments based on factual information, but they cannot take into account the wider context of the cultural-cognitive pillar. This pillar explains how collective mental frameworks are formed and how implicit assumptions are interpreted, influencing behaviour and decision-making. Since this layer is neither visible nor easily articulated, it is difficult for a digital system to address it.

These aspects mentioned reflect the interaction of the concepts 'successful implementation of dispute resolution methods' and 'successful implementation of digitalisation' on the right-hand side of the conceptual framework.

6.2 Validation

In this section, the organisation and outcomes of the expert panel are addressed. Validation of the findings was done through an expert panel meeting consisting of three Turner & Townsend professionals working in the building industry with experience in working in both the Netherlands and England, see table 6.1 for an overview of the panellists. Note that none of these experts have also conducted an interview. The panellists were provided with a brief introduction of the research and the set-up of the panel meeting, see Appendix H and I. During the panel meeting, a concise presentation was given to summarise the research' purpose. After this introduction, statements, based on the findings in the literature and the empirical research, were presented to the panel. Per statement, an open discussion was facilitated. The input of the panel is used to validate the findings and to develop recommendations for practice. In the following sections, the statements and an overview of the discussions can be found. Appendix J contains the transcripts of these discussions. Note: the discussion with expert 3 took place in a separate meeting since they were unable to attend the initial meeting planned.

Table 6.1: *Overview of the panellists.*

Expert	Role	Years of experience
1	Associate director	15
2	Director	38
3	Associate director	24

6.2.1 Statement I

In both case studies and the explorative conversations, it came up that digital technologies other than email and Teams were not used in similar small projects. From the interviews, it emerged that the project manager has a very significant role in the decision-making regarding appropriate solutions for disputes, since they are positioned between the client and the contractor. For that reason, the following statement was developed:

If the project management organisation promotes the use of digital technologies, client and contractor organisations are more likely to be open to use those technologies.

When discussing this statement, a distinction was made between digital technologies to prevent disputes and to resolve disputes. Using digital technologies for preventing disputes, the general stretch of the discussions suggested that, while project management companies can promote digital technologies, their successful adoption depends on the capabilities and readiness of client and contractor organisations. A key barrier that was mentioned by all experts is the time and cost required to learn and implement new technologies, making their adoption more challenging, particularly in small-scale projects. Expert 1 said the following about this:

'The thing with smaller purchases is: they're fast. And learning on digital technologies can take time. So by the time you get to discuss the software, agree on the software, and learn that software, the project is finished.'

Expert 3 added to this that, even though the top layer has agreed to implement something, when the lower levels, who are actually doing the work, do not understand the benefits that the top layer understands, it does not get picked up. Additionally, when the lower levels are not trained sufficiently, they will question why the top layer is adding more work, since they are used to do it another way.

In the discussion with expert 1 and 2 it was mentioned that they thought contractors in the UK are generally much more advanced in using these type of technologies, since it has been mandated to use BIM level 2 in governmental projects since 2016. In the same discussion it was also mentioned that there are many different products that can be used, and even that people or organisations may use the same product differently. Expert 1 mentioned that if a contractor brings in a certain technology, Turner & Townsend will just adopt into it.

Overall, the experts did not think that it would be effective if a project management organisation would invest in digital technologies to prevent disputes in small-scale projects. This is mainly due to the costs and time it takes to train and learn the lower levels to understand the benefits of using the technology, which sets restrains in these types of projects.

When talking about digital technologies to resolve disputes, expert 2 mentioned the following:

'With a digital platform you can't really argue, because what's there is there. So in terms of dispute resolution, there's lots of benefits to having a digital trail.'

The other experts agreed with this and mentioned that a digital audit trail is useful and more convenient than a paper trail in dispute resolution. This opened the discussion for the second statement.

6.2.2 Statement II

In the literature review it was noted that ADR methods have been developed to decrease costs and time relevant to litigation, but also to reduce hostility and ensure good relationships are maintained. It emerged from the interviews that small-scale projects tend to value good relationships within the project team more than in large projects, and was even found to be an important factor for dispute resolution methods to be considered effective. It was frequently mentioned that the human connection in dispute resolution is important to have. However, the role of the human connection and the difference in its scope between the two studied cases needed to be further elaborated. For that reason, the second statement was formulated:

If trust in a digital system to make a fair and reasonable assessment is enhanced, it can replace the human connection in dispute resolution practices.

The panellists all agreed that a digital system could not take away the human connection entirely. Expert 3 said the following about this:

'I do believe that human relationships are where you actually resolve disputes.'

It was discussed that disputes often involve subjective elements such as reasonableness and fairness, efforts, and emotional dynamics that are difficult to quantify. Human interaction, therefore, remains essential, especially in interpreting contracts, negotiating solutions, and considering context beyond hard facts.

Another aspect that was discussed here was the ability of a digitalised system to assess documents and information that can prove that certain parameters led to a delay or increase in costs. This assessment is often found to be time consuming when done manually. Expert 3 mentioned the following about this:

'Although it can take away the interpersonal relationships here, it can offer us a way to have more trust in the system as it can avoid any bias.'

Though expert 1 and 2 agreed on this, they also highlighted the differences between England and the Netherlands to accept the use of such digital systems. Expert 1 noted:

'I'd say that the UK is more contractually oriented than the Netherlands. The Netherlands may be a little more open and prone to debate and discussing things, whereas in the UK I'd say that it's more about hard facts in the contract.'

This quote shows how different cultures can value the aspect of 'what's there is there' differently, which came forward in the quote of expert 2 in the discussion of the first statement. It was mentioned that, in the Netherlands, emotions are also used strategically in discussions, and would therefore be more reluctant to use such digital systems.

6.2.3 Statement III

In the interviews, it was repeatedly mentioned that the role of an organisation such as Turner & Townsend is hired to translate the technical aspects of the project from the contractor to the client and that friction can arise when a client wants to make changes but does not realise the impact it has on the contractor's duties. This set the basis for the following statement:

An effective design feature for digital dispute resolution is when technical information is kept between the contractor and the architect, and the project manager only informs the client of this information.

Expert 3 described that such digital systems already exist and are used on a large extent in large projects. The systems makes an estimate of the impact of those changes and a delegated client representative, being the project manager or architect, explains that impact to the client. If the impact is accepted by the client, the change can get put through to the contractor. This way, the impact is already known to the higher level before it hits the lower levels, which can improve negotiations and quicken the rate of client instructions. However, expert 3 also mentioned the following about these changes initiated by the client:

'But I don't think this will lead to that many disputes in small projects, so you don't have to get into dispute resolution with this.'

The general stretch of the discussion with expert 1 and 2 was that, while clients may not fully understand technical information, completely excluding them from it is not beneficial. Visualising information can help clients grasp the impact of design and construction decisions. They also mentioned that they did not believe there is a difference between England and the Netherlands here. Expert 1 made the following remark:

'I wouldn't say there is a difference, it's human nature that they want to be involved in how the end product is going to look like.'

The general conclusion of this statement is that excluding the client from the technical information is not an effective way to shape digital dispute resolution in small-scale projects.

6.2.4 Conclusion validation

For the first statement - If the project management organisation promotes the use of digital technologies, client and contractor organisations are more likely to be open to use those technologies - the most important note was that the experts did not think that it would be effective if a project management organisation would invest in digital technologies to prevent disputes in small-scale projects. This was mainly due to the costs and time it takes to train and learn the lower levels, the contracting organisations, to understand the benefits of using the technology. However, it was believed that contractors in the UK are more advanced in using these type of technologies than Dutch contractors. Regarding digital technologies for dispute resolution, the experts agreed that a digital audit trail is beneficial to substantiate discussions.

On statement II - If trust in a digital system to make a fair and reasonable assessment is enhanced, it can replace the human connection in dispute resolution practices - the experts unanimously agreed that the human connection in dispute resolution can never fully be replaced by a digital system. The main reasons given were the human elements that are involved in disputes, such as reasonableness and fairness, efforts, and emotional dynamics, which are deemed impossible to quantify by a digital system. However, the experts noted that a digital system could be valuable to go through documents and information to give an initial assessment for a dispute solution. It was discussed that the Netherlands would be more reluctant to such technologies, as the Dutch industry for the strategic use of emotions and is prone to debate things, in contracts to the UK, which is more contractually orientated.

Statement III - An effective design feature for digital dispute resolution is when technical information is kept between the contractor and the architect, and the project manager only informs the client of this information - was not found to be valid for small-scale projects. In addition, no differences between Dutch and English organisations were mentioned.

7. Discussion and limitations

In this chapter, the empirical research, findings, and validation of this research are analysed and linked to the literature. Also, the limitations that apply to the research and reliability, validity, and transferability of the findings are addressed.

7.1 Discussion

The literature review of this research discussed the relevant literature that was used to formulate the conceptual framework, in which six models were used. In this section, each of these models is assessed and linked to the findings from the empirical research. Also, the validated statements are discussed and placed within the conceptual framework.

7.1.1 The cultural dimension theory by Hofstede

In the conceptual model, all six cultural dimensions were included in Hofstede's cultural dimensions theory. From the empirical findings, it emerged that only two of these dimensions have an influence on digital dispute resolution practices. These dimensions are femininity versus masculinity and uncertainty avoidance.

To start with femininity versus masculinity. The Netherlands classifies as a feminine culture, where conflicts are resolved through negotiation and compromise, whereas the UK is masculine and is highly decisive and result-driven. The positioning of culture on this dimension emerged strongly both in the interviewees' responses and in the exploratory discussions and validation sessions. It was unanimously emphasised that the Netherlands is indeed much more consensus-based and emotions are used strategically in negotiations, whereas England is more contractually oriented. In case A, this manifested itself in such a way that heightened emotions ultimately became the main reason for the dispute. In the search for a solution, these emotions had to be taken into account in order to ensure that the project could proceed. In the English project, it became clear that in the event of a dispute, the contract was consulted first in order to avoid confusion and to address the issue in a structured way.

The second dimension is the one of uncertainty avoidance. A finding of this research is that this dimension is subdivided into two behavioural traits when it comes to digitalisation of dispute resolution. These subcategories are strong versus weak contract regulation and the attitudes towards innovation. The Dutch culture is classified as uncertainty avoidant. According to the literature, a high level of uncertainty avoidance, is accommodated with strong regulation of laws and rules and a great tolerance of new ideas. However, the research showed that in the Netherlands, regulation of the contract is weak. Though this contradicts with the classification of uncertainty avoidance, it is in line with the feminine behaviour of the Dutch culture. The same goes for case B. The UK is classified as low in uncertainty avoidance, which is typically accompanied by weak contract regulation. However, the research showed that England is very contractually oriented. This finding contradicts to the classification of uncertainty avoidance, but, again, is in line with the masculine behaviour of the UK. The cultural dimension of femininity versus masculinity can then be used to explain behaviour around the digitalisation of dispute resolution. In a feminine culture, there will be more resistance to digitalising the resolution process because emotions and context will be given less consideration. In a masculine culture, people will be more receptive to digitalisation because more weight will be given to factual issues. The position of culture on the uncertainty avoidance dimension is thus contradictory to contractual regulation, but reinforces the observations on attitudes towards innovation,

which refers to the transition from non-digital to digital dispute resolution methods in this study.

The other four cultural dimensions - power distance, individualistic versus collectivistic, short-term versus long-term orientation, and indulgence versus restraint - did not show to have an influence on determining digital dispute resolution practices in this research.

The dimension of power distance explains whether there is a belief that people should be treated fairly and whether equality is important. Although this dimension can be used to explain the preference for negotiation as a resolution method, the dimension of femininity versus masculinity is found to be more important.

The dimension of individualistic versus collectivistic is not found to be relevant in influencing practices in this research. Both countries studied are categorised individualistic cultures, where employer-employee relationships are based on mutual benefit. However, this does not affect the way companies interact with each other in dispute resolution. Also, it does not explain the role-specific culture, as a single person was interviewed to represent the role within the project.

The long-term orientation of both countries did not affect dispute resolution practices in this research. This can be explained by the scope of this study, which is focused on small-scale projects. Long-term oriented cultures have a preference for planning and investing in the future rather than focusing on immediate results. However, in the empirical research it emerged that resistance towards adopting digital technologies is experienced in practice, largely due to the investment costs of training the different levels involved in a project. In the context of small-scale projects, these investments are regarded as excessively substantial barriers, often resulting in the unsuccessful practical implementation. Therefore, a culture's placement in this dimension is not relevant to explain the influence of culture on digital dispute resolution practices.

The dimension of indulgence versus restraint explains the value to satisfy human needs and desires over societal norms. This is not something that emerged from the interviews and is thus not linked to digital dispute resolution practices.

7.1.2 The cultural levels by Erez & Gati and Karahanna et al.

In the conceptual framework, the cultural levels model consists of three nested levels derived from the models of Erez and Gati (2004) and Karahanna et al. (2005). These levels are the national, organisational and role-specific cultures. In the empirical research, both cases confirmed that these three levels indeed play a role in digital dispute resolution practices. The national culture was clearly reflected in the different approaches to the use of contracts in the resolution of disputes, and the role of emotions and trust in both this process and the broader construction industry. The influence of organisational culture was evident in the validation phase, where it became clear that companies are key decision-makers in certain choices. For example, the decision not to invest in training to understand the technology and capabilities of new digital systems was considered financially unviable, given the short timespan of small-scale projects. Consequently, organisations were reluctant to invest in such trainings, and the technologies remained unexploited in practice. The role-specific culture emerged strongly in the interviews in both cases. The interests of different stakeholders were clearly highlighted and had a direct impact on the methods used to resolve disputes.

In addition, the research confirmed the nested structure of the model, as proposed by Erez and Gati (2004). A concrete example of the impact of the national culture on the role-specific culture through a top-down structure is, for example, the general culture of trust that prevails in the Dutch construction industry. This was mentioned as a reason why organisations generally do not recognise the distinct role of a cost manager. The influence of the role-specific culture on national culture follows a bottom-up structure. The empirical research showed that as individuals generally do not feel a strong urge to digitalise the resolution process, there is no incentive for organisations to invest in this area, resulting in no changes at the national level.

7.1.3 The institutional theory by Scott

The institutional theory of Scott (2014) was used in this research to explain the different layers within a cultural level. The empirical research shows that the regulative pillar initially plays a crucial role in shaping norms, values, and specific ways of thinking. A more detailed and rigid legal system, such as in England,

ensures that the whole industry is more contractually oriented. The interviews revealed that in England a great deal of emphasis is placed on the facts stated in the contract, whereas in the Netherlands contracts are rarely referred to.

The normative and cultural-cognitive pillars played an important role in the accepted and applied methods of dispute resolution. Factors such as reasonableness and fairness, the ability of a digital system to take into account emotions and underlying thoughts, and the elimination of human interaction were key aspects identified in the empirical research that influenced the successful implementation of digital dispute resolution methods in both case A and B.

7.1.4 Construction dispute causes by Cheung & Pang

In the literature review, the model of Cheung and Pang (2013) was used to identify the causes of construction disputes in order to determine an appropriate resolution method. However, the empirical research revealed that identifying the basic event of a dispute is not necessarily needed to determine an effective resolution method. In addition, Cheung and Pang (2013) identified contract incompleteness as the root cause for construction disputes, as it underpins both contractual and speculative disputes. The empirical research showed that contract incompleteness does lead to conflicts, but not necessarily disputes. An accumulation of basic events, combined with the human factor - including emotions that are strategically employed, the effort invested in a project, the use of human terms in contract documents, interpretations, and handling - is the most important aspect of conflict evolving into disputes. In the validation it was also highlighted that resistance to digitalising the dispute resolution process stems precisely from this human factor. However, the role of the human factor did not have the same impact in the cases studied. It was generally observed that the human factor played a greater role in the Dutch project than in the English case.

7.1.5 Successful implementation of dispute resolution methods by Marathe et al.

The literature review used the work of Marathe et al. (2017) to explain the successful implementation of dispute resolution methods. The research found that stakeholder preferences and interests are the determining factors in the application of resolution methods in practice, regardless of how formal methods are structured in theory. This was strongly evident in the empirical research, as disputes are primarily resolved through negotiation, especially in small-scale projects. This was mainly due to the cost and time implications of alternative methods, as well as the desire to maintain good relationships. The research also showed that these stakeholder preferences and interests are indeed influenced by various cultural aspects.

7.1.6 Successful implementation of digitalisation by Liu et al.

The paper by Liu et al. (2023) was used in the literature review to demonstrate that the social aspect plays a crucial role in the successful implementation of digitalisation. The empirical research confirmed that the social aspect is indeed a decisive factor in the implementation of digital technologies. This social aspect includes factors such as the time and money required to train people to understand both the technology and the benefits of digital programmes, the trust needed to allow technology to take over human tasks, and the urge to accelerate the resolution process. The empirical research clearly showed how this social aspect is linked to cultural aspects, such as femininity versus masculinity and the cultural-cognitive pillar.

7.1.7 The validated statements

Statement I - If the project management organisation promotes the use of digital technologies, client and contractor organisations are more likely to be open to use those technologies - clearly demonstrates the link between culture and the successful implementation of digital dispute resolution. Organisations play a crucial role in whether or not certain working practices are adopted, as they determine whether time and money is invested in training their staff to work with these technologies. In addition, it was highlighted during the discussion of this statement that new technologies will not be adopted unless the lower levels understand

the benefits of using them. This is because for these parties it would feel like unnecessary extra work. It was also mentioned that there is a difference between the attitude of English and Dutch contractors towards the implementation of these technologies. The discussion covered both the interaction between the different cultural levels and the links with the normative and cultural-cognitive pillars and how these influence the successful implementation of digitalisation. For this reason, this statement can be placed in the conceptual framework at the position of the arrow, which represents the influence of culture on digital dispute resolution.

During the discussion of the second statement - If trust in a digital system to make a fair and reasonable assessment is enhanced, it can replace the human connection in dispute resolution practices, much attention was given to the influence of people in both projects and dispute resolution. The fact that the experts unanimously agreed that digital systems could never fully replace the human factor in dispute resolution was mainly due to the emotions and values that people hold, as well as other aspects that cannot be quantified by a digital system. In addition, it was noted that the extent of these human influences is greater in the Netherlands than in the UK, making it likely that there would be more resistance towards a digital system in the Netherlands than in the UK. As this difference in resistance was directly related to the difference in the role of human influence in projects, this statement can be placed on the left side of the conceptual framework, on the side of culture.

The discussion of statement III - An effective design feature for digital dispute resolution is when technical information is kept between the contractor and the architect, and the project manager only informs the client of this information - was mainly focused on the technical aspect of effective digital dispute resolution and the characteristics of disputes in small-scale projects. Also, no differences were believed to be in order between the Netherlands and England. Therefore, this statement can be placed on the right-hand side of the conceptual framework.

7.2 Limitations

The first limitation of this research concerns the sample size of the interviewees. According to Guest et al. (2006) and Mason (2010), a sufficient sample size in qualitative studies typically consists of 8 to 12 people. To provide recommendations on how digitalisation can be effectively implemented in practice, the aim was to interview stakeholders from different organisations involved in the selected cases. This approach would help to capture different interests and perspectives, allowing for informed recommendations and an analysis of cultural differences between organisations in the studied countries. In practice, however, it proved difficult to establish contact with the client, contractor, and architect of case B. In addition, it was not possible to interview the project manager of this project. This limited the sample size to a total of seven interviewees. By not interviewing these stakeholders, comparisons of cultural differences and similarities could not be made, affecting the transferability of the study's findings.

Secondly, many of the interviewees had no previous experience with digital technologies in dispute resolution. As a result, they were unable to share first-hand experiences of differences in the process with or without these technologies. This made it more difficult to identify the beneficial features of such systems and to determine which elements might be unnecessary, thus affecting the validity of the study's conclusions.

A third limitation relates to whether the disputes in the cases actually qualified as disputes according to the definition given in this research. In the literature review, disputes are defined as 'conflicts that require third-party intervention to resolve in order for the project to proceed'. In case A, this definition was met, as the project could not move forward due to increasingly hostile communication. In case B, however, discussions remained general and focused on potential disputes that could arise in a project. The more detailed issues described would be classified more accurately as change management rather than disputes. This distinction, related to the study of Eisenhardt (1989), has implications for the transferability of the study's findings.

A fourth limitation relates to the validation process. The findings from the empirical research were to be validated through an expert panel meeting where experts could discuss, respond to each other's views

and exchange ideas. However, at the last moment, expert 3 was unable to attend the originally planned meeting. As a result, the validation took place in two separate meetings, which meant that the experts were unable to discuss the results with all three together. This affects the generalisability of the validation results.

Finally, the number of cases involved in this research is limited. In general, research on culture tends to be quantitative and on a much larger scale. Due to the many differences between cultures, which may seem subtle at first, it could be beneficial to gather more data. The limited number of cases, and therefore data, means that the results of this research cannot automatically be applied to other cases. However, the analytical generalisations may well be applicable to other cases.

8. Conclusion and recommendations

In this chapter, conclusions are drawn and the research questions are answered. Next, recommendations for practice are given and a management advice is presented. Recommendations for further research are given as well. The chapter ends with a reflection on the research' outcomes, the process, and a personal reflection.

8.1 Conclusion

The previous chapters described the theoretical and empirical parts of the research. In this section, the findings are used to answer the sub-questions and the main research question.

8.1.1 Conclusions of the sub-questions

1. *What does culture in the building industry entail?*

The literature review showed that culture is approached from a large variety of perspectives, resulting in numerous different definitions and interpretations of both the term and the phenomenon itself (Ankrah & Langford, 2005; Dan, 2020). To be able to say anything about culture in relation to the design of digital dispute resolution practices, the definition of culture in the building industry by Ankrah and Proverbs (2004) is used. They define culture as 'what is carried out, how and when it is done, who is involved and why things are done the way they are.' (p. 554)

The elements given in this definition initiate breaking down the concept of culture into separate concepts related to behaviour and practices within the building industry. Culture consists of different levels and layers. The majority of authors agree on a division between national, organisational, and role-specific cultures. Each cultural level consists of multiple cultural layers, which manifest at varying depths. These layers are represented by the regulative, the normative, and the cultural-cognitive pillar of the institutional theory by Scott (2014), which vary in visibility. Culture can, therefore, be intangible and is embedded most deeply in people's values. Various authors have aimed to categorise cultures to be able to compare them. A commonly used theory is the cultural dimension theory by Hofstede (2011), which describes cultures through scales that facilitate the identification of these cultural dimensions.

2. *What are decisive factors for disputes to occur?*

When a project experiences delays that affect the critical path of the project schedule, or unforeseen costs that exceed the budget, disputes may arise (Jacobs & Meesters, 2022). Extensive research has been conducted on the causes and development of disputes in construction projects.

This study examines the models of Antoniou and Tsioulpa (2024) and Cheung and Pang (2013) which outline the causes of disputes. Both models identify a set of basic events that can lead to disputes when they occur in certain combinations. Overall, the model of Cheung and Pang (2013) is more comprehensive and is widely used in the literature to explain the causes of disputes. For this reason, it was chosen for use in this thesis. Cheung and Pang (2013) identified contract incompleteness as the root cause for construction disputes, as it underpins both contractual and speculative disputes. However, the empirical research showed that though

contract incompleteness leads to conflicts, it does not necessarily lead to disputes.

The literature distinguishes between conflicts, claims and disputes. A dispute is defined as a formal disagreement that arises when contractual issues or claims are not resolved by the parties involved and require resolution outside the immediate management of the project (Alaloul et al., 2019; Cheung, 2014). Disputes are considered the result of unresolved claims, often involving legal issues. However, this research finds that disputes can arise without following the formal progression from initial conflicts to disputes as described by Naji et al. (2020). In this study, disputes are therefore defined as conflicts that require third party intervention to resolve in order for the project to proceed.

Although the basic events described by Cheung and Pang (2013) are an important factor in the occurrence of disputes, this research shows that the development of disputes does not depend solely on the occurrence of these events or on the formal rejection of requests for reimbursement for losses, as described by Alaloul et al. (2019), Cheung (2014), and Naji et al. (2020). A crucial factor in the emergence of disputes is the impact of the human aspect, which is discussed in various literature sources (Cheung & Pang, 2013; Jordan, 2000; Marathe et al., 2017; Sayed-Gharib et al., 2010). Sayed-Gharib et al. (2010) describe how values and beliefs play an important role in the development of disputes. As these elements can vary between different stakeholders, they have a major influence on the occurrence of disputes.

The occurrence of a basic event, as described by Cheung and Pang (2013), is a cause of conflict. However, it is the accumulation of basic event, combined with the human aspect - including norms, values, beliefs, emotions, and the interpretation and management of these elements and basic events - that determines whether conflicts escalate into disputes. This human aspect is shaped over time by the different components of culture.

3. *What are the most important factors influencing the successful implementation of digital technologies in dispute resolution?*

The papers by Marathe et al. (2017) and Liu et al. (2023) have been used in this research to clarify the main aspects of the successful implementation of dispute resolution methods and digitalisation in the construction industry, respectively. Figure 8.1 shows the interplay between these two aspects. Both papers emphasised the importance of the human factor on the successful implementation in practice.

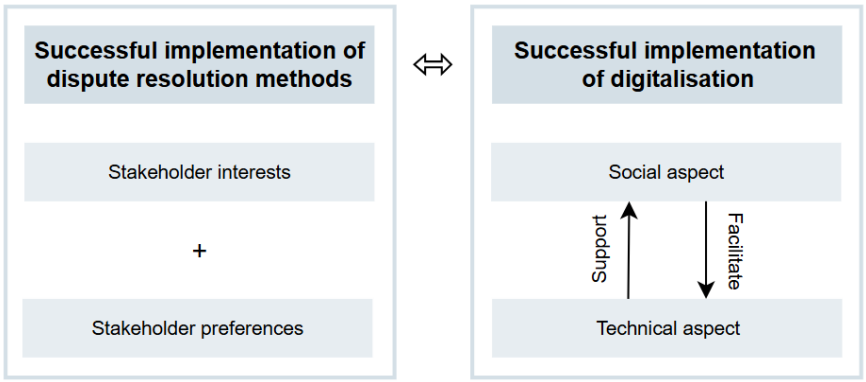

Figure 8.1: *Interconnectedness of the successful implementation of dispute resolution methods and digitalisation, based on Marathe et al. (2017) and Liu et al. (2023).*

Stakeholder preferences and interests
Marathe et al. (2017) described how stakeholder preferences refer to the methods or choices that stakeholders favour based on their personal or professional inclinations. According to Marathe et al. (2017), preferences are often influenced by factors such as ease of process, familiarity or perceived strategic advantage. These

factors are all dependent on the organisational culture. From the empirical research it emerged that the project manager is often assessing different solutions and responsible for the decision-making.

Stakeholder interests are the underlying motivations or goals that drive stakeholder behaviour, and are typically more fundamental than preferences (Marathe et al., 2017). The study points out that dispute resolution methods often only work effectively if they are aligned with stakeholders' business interests. In the empirical research and validation, it emerged that companies indeed shape stakeholders' interests, as they determine the company's working style and expectations.

The study of Gannon (1994) found that the most macro cultural level is rooted most deeply in shaping behaviour. Since the role-specific cultural level is nested within the organisational level, the organisational culture is the most important factor influencing the successful implementation of dispute resolution methods, as it shapes stakeholder interests, which are the fundamentals of stakeholder preferences.

Social and technical aspect

In their paper, Liu et al. (2023) describe how the technical aspect *supports* the social aspect, and how the social aspect *facilitates* the technical. The two aspects are interdependent and thus equally important, and their integration is essential for achieving successful implementation of digitalisation. However, the technical aspect has received much more attention in research than the social aspect. In recent years, several digital technologies have been developed that can be used in dispute resolution, such as BIM and smart contracts. The empirical research showed that the social aspect is deficient mainly in areas such as dealing with resistance, investing in facilitating training, and adapting governance. Moreover, the study found that these shortcomings are mainly found in small-scale projects, as the overall benefits of digitalisation are perceived as less essential than in large-scale projects. An important feature of culture that impact the implementation of digital technologies are confidentiality regulations within a company. These regulations set restraints on the use of certain technologies and are thus an important factor influencing the successful implementation of digitalisation in dispute resolution.

The social aspect can be explained using the different aspects of culture in the building industry. In the validation it was clarified that in small-scale projects, organisations will generally not invest in digital technologies due to the costs and time it takes to train and learn the lower levels within a project team to understand the benefits of using the technology. Also, the amount of different products that can be used, and the fact that organisations may use the same product differently, reduce the likeliness of organisations to use one and the same system to prevent disputes. This explains why organisations will not invest in such technologies in small-scale projects. For this reason, the organisational culture is again found to be one of the determining factors for the successful implementation of digitalisation in the construction industry.

4. *What are the most important elements of effective dispute resolution and what aspects of culture influence it?*

In this thesis, the following definition for effective dispute resolution was posed: dispute resolution that is successful in achieving the desired objectives. The literature review used the paper of Marathe et al. (2017) to explain the successful implementation of dispute resolution methods. In their paper, they discussed that stakeholder interests and preferences are the most important factors for resolution methods to be used effectively.

In the empirical research, the interviewees were asked to define effective dispute resolution and to describe in which degree they would like to increase the efficiency of the process. Figure 8.2 provides a summary of the responses given by each interviewee. Note that the project manager of case B is dashed, since this participant merely provided a supporting perception, rather than being the actual project manager of this project. The most frequently mentioned features of effective dispute resolution are staying within budget (cost), meeting the schedule, and maintaining good relationships. Staying within budget and meeting the project schedule are objectives that can be linked to general project objectives. Maintaining good relationships, however, is directly related to the effectiveness of dispute resolution and may be closely connected to cultural aspects.

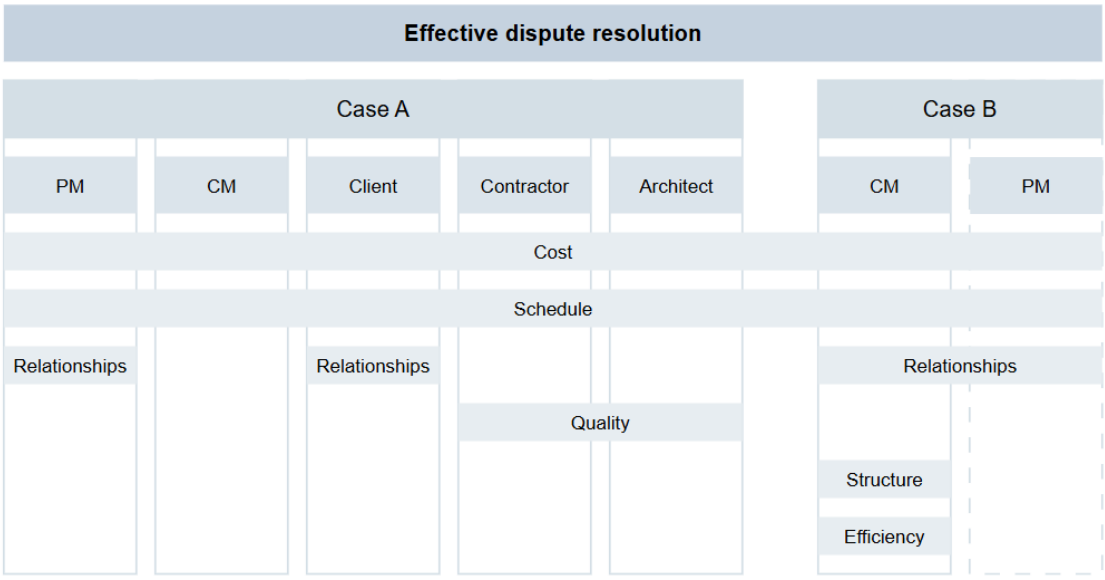

Figure 8.2: *Elements of effective dispute resolution based on the empirical research.*

The cross-case analysis and validation revealed that the Dutch construction industry generally places a greater emphasis on emotions and underlying considerations than in England. This is partly due to the differences in the legal systems of the two countries. The Netherlands is less contractually oriented than England, with contracts being less detailed and often containing terms such as 'best efforts' and 'reasonableness and fairness'. Additionally, there is a general sense of trust in the Dutch construction industry, and contracts are rarely used in dispute resolution. These elements reflect the feminine character of Dutch culture.

England, on the other hand, is highly contractually oriented, with detailed construction contracts. In resolving disputes, significant attention is paid to the facts and are directly linked to the contract clauses. Another striking observation in figure 8.2 is that it is only in case B that the objectives of structure and efficiency are mentioned. These features are associated with the masculine character and low uncertainty avoidance - particularly the positive attitude towards innovation - of the national culture. Masculinity refers to being highly decisive and result-driven, while low uncertainty avoidance is reflected in smooth processes in the workplace.

In summary, effective dispute resolution is achieved when the schedule is met, stakeholders stay within budget, and good relationships are maintained. The cultural elements influencing this are part of the national culture, primarily affecting the latter aspect.

8.1.2 Conclusion on the main research question

The main research question of this study was formulated as follows:

How can culture shape digital dispute resolution practices?

The question aims to identify how culture can shape digital dispute resolution practices in order to develop an effective advice to improve the resolution process in small-scale construction projects. Based on the answers given to the sub-questions, this question can now be answered. Culture can shape digital dispute resolution practices in the following ways:

1. A country's legal system
A country's legal system represents the regulative pillar of the national cultural level and is found to be an important element of shaping digital dispute resolution practices. Cultural levels are nested and the

more macro the level is positioned, the more deeply it is rooted in shaping behaviour (Gannon, 1994). The structure of a country's legal system has a decisive impact on the other institutional pillars of the national culture as well as on the lower cultural levels. Common law is highly focused on the completeness of the legal system, requiring detailed contracts. As a result, the construction industry is contractually oriented, focusing on facts and how they fit into the contract. In contrast, civil law is based on broad statutes interpreted by principles such as reasonableness and fairness, allowing greater flexibility beyond the written text. In such a system, emotions play a greater role than in a contractually oriented system. The legal system therefore not only influences how construction contracts are drafted and used in practice, but also shapes values and beliefs and determines the attitude towards digitalisation of dispute resolution.

The Dutch legal system is consensus-based and allows emotions to play a significant role in the Dutch construction industry, rather than mere facts. Reasonableness and fairness are important aspects within the national culture, there is an overall strong feeling of trust present in the building industry, contracts are interpreted using the Haviltex-criterion, and emotions are strategically used in negotiations. These aspects explain the feminity of the Dutch culture, where decision-making often involves lengthy discussions to ensure that all voices are heard. Regulation of the exact content of contracts is found to be relatively weak. Although this contradicts to the classification of high uncertainty avoidance, weak contract regulation reinforces the feminine behaviour of the Dutch culture. This, in turn, reinforces the significant resistance - in line with the high uncertainty avoidance - that the industry would show towards the digitalisation of dispute resolution, as a digital system would not be able to take these emotions and contexts into account. An overview of how this process works is presented in figure 8.3.

England has a detailed legal system that makes the construction industry contract-oriented, with a strong emphasis on the precise content of contracts. Facts play a crucial role in dispute resolution and the industry fosters a result-driven environment. This perspective reinforces the masculine behaviour and the recognition of the potential of digital systems in dispute resolution to reduce bias and expedite the evaluation process.

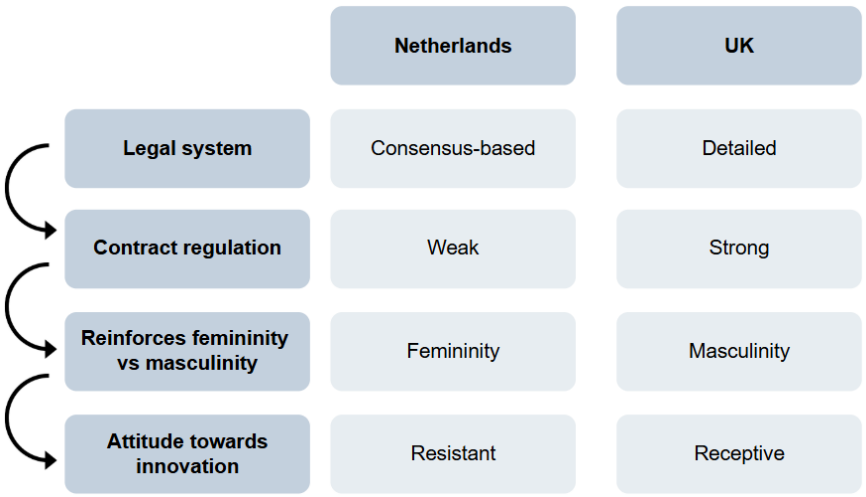

Figure 8.3: *The influence of the cultural dimensions on behaviour.*

A county's legal system shapes digital dispute resolution practices as it influences the attitude towards the implementation of digital technologies in dispute resolution. This has an impact on the scope of activities that such a system can undertake. In a consensus-based system, contract regulation is weaker and people show feminine behaviour. Within such a context, a digital system is limited to assess documents to verify whether certain parameters have led to a delay. This can speed up the evaluation process and increase transparency, while still allowing human interaction to determine how the information is used. In a contractually oriented culture, individuals show masculine, result-driven behaviour and digitalisation can be applied on a larger scale. It can be used to make an initial judgement on the allocation of responsibilities and can calculate costs by determining the impact of prolongation.

2. Resistance of organisations
The successful implementation of digitalisation is dependent on both the technical and the social aspect (Liu et al., 2023). Research on digitalisation within the building industry has mainly been focused on the technical aspect. As a result, many different technologies have been developed to prevent disputes in construction projects. However, generally, organisations will not invest in digital technologies in small-scale projects due to the costs and time it takes to train and learn the lower levels within a project team to understand the benefits of using the technology. Also, the amount of different products that can be used, and the fact that organisations may use the same product differently, reduce the likeliness of organisations to invest in digital technologies to prevent disputes in small-scale projects. In these projects, the project manager is often assessing different solutions and responsible for the decision-making. Lee et al. (2016) noted that, sometimes, disputes are inevitable and need to be handled and resolved. Therefore, project management organisations should invest in digital technologies to resolve disputes, rather than to prevent disputes. This way, only the project management organisation will have to be trained to understand how to use the technology and a homogeneous use of the technology is facilitated.

3. Regulations within the company
Regulations within a company affect the scope of the abilities of certain digital technologies and thus restrain the use of those technologies. Organisations should invest in developing an internal digital system to ensure the company's regulations. This way, the system can have access to all relevant information needed for dispute resolution.

The above conclusion of this thesis can be summarised as follows: project management organisations should invest in developing an internal digital system to support the decision-making in dispute resolution, rather than to invest in dispute-preventing technologies. As project managers are responsible for this decision-making, their organisations need to invest in such technologies to comply with the company's regulations. In a consensus-based (feminine) culture, such digital system is limited to assess documents to verify whether certain parameters have led to a delay. This can speed up the evaluation process and increase transparency, while still allowing human interaction to determine how the information is used. In a result-driven (masculine) culture, digitalisation can be applied on a larger scale. It can be used to make an initial judgement on the allocation of responsibilities and can calculate costs by determining the impact of prolongation. In this way, effective dispute resolution can be ensured, keeping the project on time and within budget, while maintaining good relations.

8.2 Recommendations for practice

In this section, recommendations for practice are given. These recommendations are based on this research' findings and provide a basis for the implementation of the conclusion.

1. Assess the cultural position of the project team
This research showed that Hofstede's cultural dimensions of femininity versus masculinity and uncertainty avoidance are relevant dimensions in the successful implementation of digitalisation in dispute resolution processes in small-scale projects. It is, therefore, recommended that the cultural position of the project team is assessed by the project manager, particularly on the cultural dimensions of femininity versus masculinity and uncertainty avoidance. These dimensions explain the project team's consensus-based or result-driven focus and the attitude towards technical innovation in dispute resolution. By reflecting on what the cultural profile of the project team look like, the project manager can familiarise with the characteristics of such composed project teams and learn how to deal with them. In this way, the dispute resolution process will run more smoothly over time and the elements of effective dispute resolution will be reinforced.

2. Invest in a digital system to support dispute resolution, not prevention
This research showed that organisations will generally not invest in digital technologies in small-scale projects due to the costs and time it takes to train and learn the lower levels within a project team to understand the

benefits of using the technology. Also, the amount of different products that can be used, and the fact that organisations may use the same product differently, reduce the likeliness of organisations to use one and the same system to prevent disputes in building projects. Therefore, project management organisations should invest in digital technologies to support the resolution process, rather than to prevent disputes. This way, only the project management organisation will have to be trained to understand how to use the technology and a homogeneous use of the technology is facilitated. In addition, since the technology is developed within the project management organisation, the technology will automatically comply to the company's regulations, ensuring access to all relevant information needed for resolving disputes.

3. Combine culture with the development of the digital technology
Once the culture of the project team is known, the abilities of a digital system can be determined. In a consensus-based culture, resistance towards the implementation is generally significant, whereas in a result-driven culture people are receptive to digitalisation of dispute resolution, as it reduces the possibility for bias and increases contractual rigidity. Therefore, in a consensus-based culture, a digital system is limited to assess documents to verify whether certain parameters have led to a delay. This can speed up the evaluation process and increase transparency, while still allowing human interaction to determine how the information is used. In a result-driven culture, digitalisation can be applied on a larger scale. It can be used to make an initial judgement on the allocation of responsibilities and can calculate costs by determining the impact of prolongation. The abilities of the technical system thus have to be aligned with the cultural preferences within a project team to ensure the successful implementation of digitalisation to improve the dispute resolution process.

8.3 Management advice

This section presents an advice on how to manage the conclusions and the recommendations for practice. The management advice provides insight in how the recommendations for practice should be approached in both England and the Netherlands to ensure effective implementation and is divided into four phases: invest in digitalisation, make the intangible tangible, apply the knowledge and undertake action, and evaluate and improve. Figure 8.4 presents an overview in which phases which actions should be undertaken to manage digitalisation of dispute resolution as effectively as possible. The advice is based on a project team consisting of a client, a project manager, a contractor, and consultants that are selected and appointed by the client, who will be advised by the project manager. The advice is written from a project managers perspective, as they play a vital role in the digitalisation of the dispute resolution process according to the conclusions and recommendations. Note that this advice forms a basis for further development of the implementation of the conclusions and recommendations and that it has not been applied in practice yet.

Invest in digitalisation

The starting point of digitalising the dispute resolution process is to invest in digitalisation. This phase consists of two steps that are both organisation-specific as each company has its unique working style, expectations, and regulations.

1. Develop the technology
The first step is to develop the technology. As different project team compositions will require different capabilities from the technology, it is important that the digital system can distinguish between different functions. As highlighted in the conclusion, it is likely that in project teams similar to case A, the technology will be limited to verifying whether certain parameters have led to a delay. However, in project teams closer to the English culture, the technology will be used on a larger scale, making an initial judgement on the allocation of responsibilities and calculating costs by determining the impact of prolongation. When developing the technology, it is important to remember that the system needs access to relevant information in order to carry out the assessment.

2. Develop a training programme

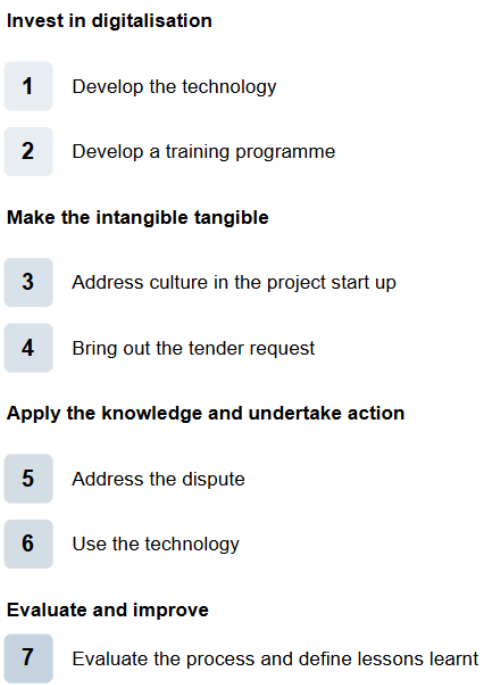

Figure 8.4: *The different phases and accompanying actions of the management advice.*

The research showed that organisations show resistance towards digitalisation as they do not understand the technology itself or the benefits the use of it brings. Therefore, it is advised that project management organisations offer a training programme to their project managers to learn how to use the technology in a project and get familiar with the capabilities of the different functions. By letting the company determine how to shape the training programme, employees' interests and preferences will be aligned with the company's, reinforcing the successful implementation of dispute resolution methods. In addition, since the project managers will be trained, the resolution process will run more smoothly and the elements of effective dispute resolution will be reinforced.

Make the intangible tangible

Culture can be intangible as it manifests at varying depths and can be embedded most deeply in people's values. This influences the amount of time and attention devoted to it in managing projects. Aspects such as costs and time are tangible and measurable, which makes them more evident to manage. However, to ensure the aspect is a beneficial factor that elevates the dispute resolution process, it has to be managed effectively. This can be done through three consecutive steps.

3. Address culture in the project start up
In the project start up, it is advised to pay explicit attention to the culture of the client. As the client initiates the project and issues the tender request, it is beneficial for the project manager to familiarise themselves with the client's culture. Helpful aspects in this regard include:

- the country of origin of the company,
- the country in which the office in question is located,
- the preferred contract form for the project,
- the size of the team involved in the project, and
- reading up on previous projects.

The latter two can help indicate the extend to which the client wants to be involved in day-to-day work and clarify their values and goals, respectively.

4. Bring out the tender request
To align stakeholder expectations, include the purpose of the digital system in the tender request. This will attract contractors who have a similar way of resolving disputes. It also avoids resistance to the use of technology during the project as all parties, including selected consultants, are informed in advance.

Apply the knowledge and undertake action

Once the concept of culture is made tangible and expectations are well aligned, the knowledge and skills obtained in the training can be applied in practice.

5. Address the dispute
In case of a dispute, address the dispute and explain what the digital system is used for, how it will support the decision-making, and what the benefits of the technology are in order to gain trust of the stakeholders that the technology will benefit the resolution process.

6. Use the technology
Use the technology accordingly to the culture of the project team. Having the project manager trained to recognise the project team's culture, he or she can determine how to use the digital system to support the decision-making in the resolution process, while ensuring that the elements of effective dispute resolution are reinforced. Once an agreement on the solution is reached, the project execution can proceed.

Evaluate and improve

After the dispute has been resolved, it is now time to evaluated and provide feedback in order for the technology to be improved and ensure continuous learning and development.

7. Evaluate the process and define lessons learnt
Evaluating the process will identify successful aspects of the digital system and areas for improvement. In this way, feedback can be provided to improve both the technology and the training of steps 1 and 2. This will ensure continued alignment and ongoing development of effective dispute resolution elements. It is recommended that this step is carried out with the entire project team to ensure the satisfaction of all stakeholders in future projects.

8.4 Recommendations for further research

In this section, recommendations for further research into the subject of the influence of culture on digital dispute resolution practices are given. Based on this research, the following topics are recommended:

1. Include a wider variety of participants
In this research, a total of seven people were interviewed. It is recommended that in similar research, a wider variety of stakeholders is interviewed, both within the project team as within the same organisation. This way, better insight is gained in the stakeholders' interests and the differences in those interests across the projects. This study may lead to new insights or support the existing findings.

2. Compare traditional and integrated contracts
As a contract sets out the responsibilities of the parties, the role of the basic event and the human factor, such as stakeholder interests and preferences, in dispute resolution may differ in projects constructed under an integrated contract. By comparing the outcomes of this research with the outcomes of research that studied projects constructed under integrated contracts, a more holistic understanding of how (regulative) culture can shape digital dispute resolution practices is provided.

3. Include other countries
This research concluded that a country's legal system has a significant influence on shaping digital dispute resolution practices, as it is deeply rooted in shaping behaviour. When similar research is conducted, including different countries than studied in this research, knowledge on the impact of the legal system on digital dispute resolution practices can be expanded. In addition, credibility of the current findings can be reinforced, or may lead to new insights.

4. Focus more on the definition of disputes
During the interviews and the validation meetings, it became clear that the participants did not always have a clear understanding of what disputes entail. This suggests that overall, they may have not fully understand the concept of disputes as understood in this research. Therefore, it is recommended that in further research, a greater focus on the definition of disputes is provided to the participants. This may lead to new insights on how disputes arise and should be resolved in small-scale projects.

5. Develop digital technologies
This research concluded with an advice how to successfully implement digital technologies in dispute resolution based on cultural preferences. The effectiveness of this advice is yet to be established, and should thus be explored further. It is recommended that future research is conducted to develop the technologies as proposed in this study to test the effectiveness of the advice in practice. This way, subsequent technical developments are initiated and tested on successful practical implementation.

8.5 Reflection

In this section, I reflect on the outcomes and the process of this research, and my experiences during this research.

8.5.1 The research outcomes

The outcomes of this research are reflected in this part of the reflection, including the product delivered, the position of the research in the Master track, and the relevance of the research.

The product

A first note that should be made concerning the product of this research is the cultural perspective from which it is written. Judging another culture from the basic perspective of one's own standards and values, ethnocentrism is almost inevitable. In this thesis, I have aimed to reduce the impact of my own cultural bias as much as possible by asking open-ended questions in the interviews, keeping as open-minded as possible, and not showing positive or negative reactions to the answers provided. This allowed the interviewees to give their open and honest opinion. I have tried to maintain reflexivity throughout the research process by actively reflecting on my biases and role in interpretation the data, ensuring that the interpretations remained grounded in the participants' - of both the interviewees as the expert panellists - experiences, rather than my own perceptions.

In my research, I have dedicated a lot of time to my literature study, trying to get a comprehensive overview. The literature review used a variety of sources, ranging from books to conference proceedings. A wide range of sources were used to ensure sufficient data triangulation and validity. The theories used in the conceptual framework were most useful in interpreting my findings. The extensive theoretical study resulted in a strong theoretical framework, which enabled me to continuously make notes during the rest of the research, linking aspects of the empirical research to elements of the literature review.

One of the first things I realised in my research was that I could not ask interviewees direct questions about cultural aspects as they were unlikely to provide me with useful answers. As a result, I had to infer cultural aspects from their responses. This means that some aspects of culture may not have been interpreted in the same way the authors did of the literature used in this study intended. In this respect, reflexivity was

particularly important to ensure that bias was minimised. Interim findings and ideas were discussed with my supervisors to gain insight from more experienced researchers. These ideas were then critically evaluated and compared to both the theoretical framework and empirical research to ensure an accurate and objective outcome.

Throughout the research, it was important to remind both the participants and myself that the scope of the study focused on disputes in small-scale projects. More than once, interviewees referred to disputes in large projects and the technologies used in those contexts. Similarly, during the literature review, I had to be vigilant as to whether certain information was only applicable to large projects - which make up the majority of the existing literature - or whether it could also be used for this research. These observations reinforced the identified research gap: there is a lack of knowledge about digital dispute resolution in small construction projects.

The validation meetings provided a valuable opportunity to concretise all the knowledge gained from both the literature review and the empirical research. This ultimately enabled the formulation of clear conclusions and practical recommendations. In my view, culture is an important factor in changes within the construction industry, although it is not always at the forefront. It is reflected in the behaviour and mindset of people within the industry and needs to be actively addressed and explored to ensure effective change within the sector. During my internship, I observed that theory and practice do not always align. People in the industry like to see concrete ideas and actions to make concepts tangible. I believe that the recommendations made in this study provide a strong basis for putting the findings into practice. However, due to the limited number of participants in this research, the findings and conclusions are not automatically applicable to the construction industry as a whole. They are the first findings in this context and form an exploration for future research.

Position within the MSc track

This thesis is written as part of the Master track Projects & People, which is part of the programme Construction Management and Engineering (CME) at the Delft University of Technology. The Projects & People specialisation focuses on the management of projects by following a holistic approach by, for, and with people collaborating across organisations and learning to adapt to change. This research has combined these elements by taking cultural aspects within the building industry, link them to practices of different stakeholders in a project team, and share findings on how to effectively implement digital technologies in dispute resolution to change and improve the dispute resolution process in small-scale projects.

Understanding the impact of culture on people's behaviour is an important aspect in the educational programme of CME. The programme focuses on the management of projects done by people. In my view, management starts with understanding where people are coming from and why people act and think the way they do. By addressing the topic of culture in projects, awareness of people's behaviour is heightened and management approaches can be adjusted accordingly, enabling a more suited approach and smooth project delivery.

Relevance of the research

The relevance of this research can be divided in two main categories: academic and practical. The academic relevance of this study is related to the objective to close the existing gap in knowledge in existing literature on the influence of culture on the successful implementation of digital dispute resolution methods in small-scale construction projects. Academics are provided with new insights of the relationship between culture and project processes and are given incentives for further research.

The practical relevance of this study is aimed at practitioners within the building industry, particularly organisation that offer project management services. The outcomes of this research have been converted into recommendations for practice in order to give insight in how to effectively use digital technology in dispute resolution practices to improve the resolution process.

8.5.2 The research process

The research method of this study was divided in a theoretical and empirical part. When conducting the literature review, it was important to critically assess which sources could be used for my research and which studies needed to be excluded. This was necessary to maintain focus on the research objectives and to ensure that achievable goals could be met within the given timeframe. Throughout the study, several adjustments were made to the literature review to better align it with the empirical data collected. Initially, I expected the literature review to be a linear process, but in practice it proved to be iterative. This allowed for continuous reflection on the relevance of the theory, keeping the project aims and the main research question in mind throughout the study.

The empirical part of the research was designed around a comparative case study. This approach required the selection of two cases to be analysed both individually (in-case) and comparatively (cross-case). Finding suitable case studies proved to be a challenge. To ensure comparability, the 'most similar systems' design by Przeworski and Teune (1970) was applied, discussed in section 3.2.2. However, the strict selection criteria significantly limited the number of suitable projects, making it more difficult to find two comparable cases than initially expected. Eventually, with the support of my company supervisors, I was able to select two comparable projects and interview relevant stakeholders.

However, in case B it was not possible to interview any stakeholders other than the cost manager. Due to the limited number of suitable projects and time constraints, it was not possible to replace case B with another project to allow for a wider range of stakeholder interviews. This limitation may also be related to the fact that I was a graduate researcher at the Amsterdam office of Turner & Townsend. Communicating my research objectives and requirements to potential participants was much easier for the Dutch project than for the English project. In addition, the links between Turner & Townsend England and other stakeholders did not allow me to make contact with them, resulting in fewer stakeholders being interviewed for case B than originally intended. To gain additional insight into construction practices in England and the cultural differences between the cases, I interviewed a project manager with work experience in both the UK and the Netherlands.

Overall, the chosen research approach appeared to be a suitable method for obtaining a sufficient level of in-depth information. However, to further improve the interview process, test interviews could have been conducted beforehand to refine the interview structure and questions before engaging with stakeholders. During some interviews I found that participants had not previously considered certain aspects, making it difficult for them to answer certain questions. Conducting test interviews would have helped to identify potential areas of confusion for external stakeholders that a researcher, who is intimately familiar with the study, might overlook. According to Schön (2017) this is a common phenomenon in research. Professionals often have implicit and tacit knowledge that they use in their daily practice. However, making this knowledge explicit and reflecting on it can be challenging.

The variety of responses to the interview questions made for interesting conversations and allowed for clarification and deviation from the general line of questioning. Recording and transcribing the interviews was a very convenient way for me to structure the information and compare responses within and across cases. I believe that the qualitative, semi-structured interview approach was the most suited way to obtain information for this research and to add knowledge to the existing literature. The expert panel was also a helpful step in my research process. The experts provided me with useful input to use in my conclusions and allowed me to develop my recommendations for practice.

The data plan and ethical considerations described in section 3.2 have been adhered to throughout the research. Only the strictly needed personal information is asked for or used in the research and no unnecessary information is shared with the people both in the thesis committee and outside the research team.

8.5.3 Personal experiences

Reflecting on the time working on my thesis I look back at in with a positive view. I have enjoying learning about my graduation subject and finding links between the literature and practice. My organisational skills and high level of self-discipline have proven to be major assets during this process. There have been some struggles finding suitable cases for my research, but with help of the people from Turner & Townsend, I have still been able to gain valuable information for my research. The openness of the people at Turner & Townsend and their willingness to contribute to my research have been really nice and made it an enjoyable and a suitable place to work on my thesis. They have allowed me to conduct my research independently, letting me structure my research exactly the way I wanted to. They allowed me to work remote, but encouraged me to work from the office so I could get to know the people on the working floor, which made it easy for me to ask people things at short notice.

The sessions with my TU Delft supervisors have been very helpful to provide me with feedback and to have discussions about the research process. The composition of my committee had a fine balance of combining theoretical research with practical research. Their experiences and views shared ensured that I was constantly looking at my research with fresh eyes and allowed me to make well thought out choices. I believe that my supervisors had my best interests at heart and were just as interested in the outcomes of my research as I was, which made for an overall enjoyable collaboration during my thesis.

The past few months have taught me more than just how to do individual scientific research. They have helped me to see where my interests lie and have provided me with a basis for the direction I would like to take in my future career. Overall, I am satisfied with the process and the final product.

References

Abiodun, O. E., Segbenu, N. S., & Oluseye, O. (2017). Factors affecting contractors' performance in construction project delivery in akure, ondo state, nigeria. *Journal of Knowledge Management, Economics and Information Technology*, *7*, 1–23.

Acts of the English Parliament. (2011). Statute of frauds (1677). *Legislation.gov.uk*. https://www.legislation.gov.uk/aep/Cha2/29/3/section/IV

Adekunle, S. A., Aigbavboa, C., Ejohwomu, O., Ikuabe, M., & Ogunbayo, B. (2022). A critical review of maturity model development in the digitisation era. *Buildings*, *12*, 858. https://doi.org/10.3390/buildings12060858

Adekunle, S. A., Aigbavboa, C. O., Ejohwomu, O., Adekunle, E. A., & Thwala, W. D. (2021). Digital transformation in the construction industry: A bibliometric review. *Journal of Engineering, Design and Technology*, *22*. https://doi.org/10.1108/jedt-08-2021-0442

Aigbe, F., Aigbavboa, C., Aliu, J., & Amusan, L. (2024). Understanding the future competitive advantages of the construction industry. *Buildings*, *14*, 1616. https://doi.org/10.3390/buildings14061616

Alaloul, W. S., Hasaniyah, M. W., & Tayeh, B. A. (2019). A comprehensive review of disputes prevention and resolution in construction projects (R. Wirahadikusumah, B. Hasiholan, & P. Kusumaningrum, Eds.). *MATEC Web of Conferences*, *270*, 05012. https://doi.org/10.1051/matecconf/201927005012

Alaloul, W. S., Musarat, M. A., Rabbani, M. B. A., Altaf, M., Alzubi, K. M., & Al Salaheen, M. (2022). Assessment of economic sustainability in the construction sector: Evidence from three developed countries (the usa, china, and the uk). *Sustainability*, *14*, 6326. https://doi.org/10.3390/su14106326

Alkilani, S., & Loosemore, M. (2022). Project performance measurement for small-and-medium sized construction contractors in the jordanian construction industry. *Construction Management and Economics*, *40*, 743–769. https://doi.org/10.1080/01446193.2022.2108863

Allen & Overy. (2016). Basic principles of english contract law. https://www.a4id.org/wp-content/uploads/2016/10/A4ID-english-contract-law-at-a-glance.pdf

Alshenqeeti, H. (2014). Interviewing as a data collection method: A critical review. *English Linguistics Research*, *3*, 39–45. https://doi.org/10.5430/elr.v3n1p39

American Law Institute. (1981). *Restatement (second) of contracts*.

Anderson, R., Guerreiro, M., & Smith, J. (2016). Are all biases bad? collaborative grounded theory in developmental evaluation of education policy. *Journal of MultiDisciplinary Evaluation*, *12*, 44–57. https://doi.org/10.56645/jmde.v12i27.449

Andrews, N. (2015). Interpretation of written contracts in england. *Russian Law Journal*, *2*, 12. https://doi.org/10.17589/2309-8678-2014-2-1-12-28

Ankrah & Langford. (2005). Architects and contractors: A comparative study of organizational cultures. *Construction Management and Economics*, *23*, 595–607. https://doi.org/10.1080/01446190500126973

Ankrah & Proverbs. (2004). Treading the softer areas of construction management: A critical review of culture. *Association of Researchers in Construction Management*, *1*, 551–558.

Anson, W., & Huffcut, E. (1879). *Principles of the english law of contract*. Clarendon Press.

Antoniou, F., & Tsioulpa, A. V. (2024). Assessing the delay, cost, and quality risks of claims on construction contract performance. *Buildings*, *14*, 333. https://doi.org/10.3390/buildings14020333

Arditi, D., Oksay, F., & Tokdemir, O. (1998). Predicting the outcome of construction litigation using neural networks. *Computer-Aided Civil and Infrastructure Engineering*, *13*, 75–81.

Assah-Kissiedu, M., Fugar, F., & Badu, E. (2010). Triggers of disputes within the ghanaian construction industry. *Journal of Construction*, *3*, 17–28.

Azarian, R. (2014). Potentials and limitations of comparative method in social science. *International Journal of Humanities and Social Science*, *1*, 113–125.

Bandara, R., Abeynayake, M., Illeperuma, I., & Eranga, B. (2024). Smart contract applications for mitigating disputes in the construction industry. *Proceedings of the 12th World Construction Symposium*, 933–946. https://doi.org/10.31705/wcs.2024.74

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, *13*, 544–559. https://doi.org/10.46743/2160-3715/2008.1573

Bernard, H. R., & Ryan, G. (1998). Text analysis: Qualitative and quantitative methods. Sage.

Berríos, R. (2024). How culture impacts economic development: A cross-country comparison. *Journal of developing societies*, *40*. https://doi.org/10.1177/0169796x241237978

Blau, P. M., & Scott, W. R. (2004). *Formal organizations: A comparative approach*. Stanford University Press.

Blaxter, L., Hughes, C., & Tight, M. (2006, October). *How to research* (3rd ed.). Open University Press. https://abcreorg.weebly.com/uploads/9/9/8/2/9982776/how_to_research.pdf

Bochner, A. P. (2017). Unfurling rigor: On continuity and change in qualitative inquiry. *Qualitative Inquiry*, *24*, 359–368. https://doi.org/10.1177/1077800417727766

Boman, B. (2022). Pisa achievement in sweden from the perspective of both individual data and aggregated cross-country data. *Frontiers in Education*, *6*. https://doi.org/10.3389/feduc.2021.753347

Booth, A., Sutton, A., & Papaioannou, D. (2016, May). *Systematic approaches to a successful literature review* (2nd ed.). SAGE. https://www.researchgate.net/profile/Andrew-Booth-2/publication/235930866_Systematic_Approaches_to_a_Successful_Literature_Review/links/5da06c7f45851553ff8705fa/Systematic-Approaches-to-a-Successful-Literature-Review.pdf

Brewerton, P. M., & Millward, L. J. (2001, April). *Organizational research methods*. SAGE.

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.

Bumann, J., & Peter, M. (2019, November). Action fields of digital transformation - a review and comparative analysis of digital transformation maturity models and frameworks.

Burches, E., & Burches, M. (2020). Efficacy, effectiveness and efficiency in the health care: The need for an agreement to clarify its meaning. *International Archives of Public Health and Community Medicine*, *4*. https://doi.org/10.23937/2643-4512/1710035

Burnard, P. (1991). A method of analysing interview transcripts in qualitative research. *Nurse Education Today*, *11*, 461–466. https://doi.org/10.1016/0260-6917(91)90009-y

Campbell, J. L., Quincy, C., Osserman, J., & Pedersen, O. K. (2013). Coding in-depth semistructured interviews: Problems of unitization and intercoder reliability and agreement. *Sociological Methods & Research*, *42*, 294–320. https://doi.org/10.1177/0049124113500475

Carlson, J. (2014). Avoiding traps in member checking. *The Qualitative Report*, *15*. https://doi.org/10.46743/2160-3715/2010.1332

Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, A. (2014). The use of triangulation in qualitative research. *Oncology Nursing Forum*, *41*, 545–547. https://doi.org/10.1188/14.ONF.545-547

Chao-Duivis, M., Bruggeman, E., Koning, A., & Ubink, A. (2018). *A practical guide to dutch building contracts* (4th ed.). Stichting Instituut Voor Bouwrecht.

Chaudhari, C., Vaghela, P., Memakiya, S., Prajapati, A., & Pitroda, J. (2015). A critical literature review on factors affecting performance of contractors in building construction. *International Journal of Advanced Research in Engineering, Science & Management*.

Cheng, M.-Y., Tsai, H.-C., & Chiu, Y.-H. (2009). Fuzzy case-based reasoning for coping with construction disputes. *Expert Systems with Applications*, *36*, 4106–4113. https://doi.org/10.1016/j.eswa.2008.03.025

Cheung, S. O. (2014). *Construction dispute research : Conceptualisation, avoidance and resolution*. Springer International Publishing.

Cheung, S. O., & Pang, K. H. Y. (2013). Anatomy of construction disputes. *Journal of Construction Engineering and Management*, *139*, 15–23. https://doi.org/10.1061/(asce)co.1943-7862.0000532

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed.). Routledge. https://islmblogblog.wordpress.com/wp-content/uploads/2016/05/rme-edu-helpline-blogspot-com.pdf

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Sage.

Creswell, J. W., & Creswell, J. D. (2009). *Research design: Qualitative, quantitative mixed methods approaches* (3rd ed.). Sage. https://www.ucg.ac.me/skladiste/blog_609332/objava_105202/fajlovi/Creswell.pdf

Dainow, J. (1966). The civil law and the common law: Some points of comparison. *The American Journal of Comparative Law*, *15*, 419–435. https://doi.org/10.2307/838275

Dan, M. (2020). Culture as a multi-level and multi-layer construct. *Review of International Comparative Management*, *21*, 226–240. https://doi.org/10.24818/RMCI.2020.2.226

DCC. (2024). Article 6:213. *wetten.overheid.nl*. https://wetten.overheid.nl/BWBR0005289/2024-10-01

Dean, K. L. (2007). Book review: Qualitative interviewing: The art of hearing data. *Organizational Research Methods*, *10*, 184–187. https://doi.org/10.1177/1094428106290196

Delise, L. A., Lee, B., & Choi, Y. (2023). Understanding project management performance using a comparative overrun measure. *International Journal of Project Management*, *41*, 102450. https://doi.org/10.1016/j.ijproman.2023.102450

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, *48*, 147–160. https://doi.org/https://doi.org/10.2307/2095101

Dudok van Heel, R. A., & Tjittes, R. P. J. L. (2022). The netherlands commercial court and business certainty in dutch and english commercial contract law. https://www.rechtspraak.nl/English/NCC/news/Pages/Perceived-differences-between-English-and-Dutch-contract-construction-are-no-more-than-caricatures.aspx

Edmondson, A. C. (2002). The local and variegated nature of learning in organizations: A group-level perspective. *Organization Science*, *13*, 128–146. https://doi.org/10.1287/orsc.13.2.128.530

Eisenhardt, K. M. (1989). Building theories from case study research. *The Academy of Management Review*, *14*, 532–550.

Erez, M., & Gati, E. (2004). A dynamic, multi-level model of culture: From the micro level of the individual to the macro level of a global culture. *Applied Psychology*, *53*, 583–598. https://doi.org/10.1111/j.1464-0597.2004.00190.x

Eze, E. C., Sofolahan, O., & Omoboye, O. G. (2023). Assessment of barriers to the adoption of sustainable building materials (sbm) in the construction industry of a developing country. *Frontiers in Engineering and Built Environment*, *3*. https://doi.org/10.1108/febe-07-2022-0029

Farooqui, R. U., Umer, M., & Azhar, S. (2014, June). *Key causes of disputes in the pakistani construction industry-assessment of trends from the viewpoint of contractors*.

Fei, W., Opoku, A., Agyekum, K., Oppon, J. A., Ahmed, V., Chen, C., & Lok, K. L. (2021). The critical role of the construction industry in achieving the sustainable development goals (sdgs): Delivering projects for the common good. *Sustainability*, *13*, 9112.

Fenn, P., & Gameson, R. (1992). *Construction conflict management and resolution*. E & Fn Spon.

Flick, U. (2009). *An introduction to qualitative research* (4th ed.). Sage. https://elearning.shisu.edu.cn/pluginfile.php/35310/mod_resource/content/2/Research-Intro-Flick.pdf

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry*, *12*, 219–245. https://doi.org/https://doi.org/10.1177/1077800405284363

Flyvbjerg, B., & Gardner, D. (2023, February). *How big things get done*. Currency.

Gannon, M. J. (1994). *Understanding global cultures : Metaphorical journeys through 17 countries* (2nd ed.). Sage Publications.

Giacalone, M., & Sajedeh Salehi, S. (2022). Small claims and the pursuit of (digital) justice: A tiered online dispute resolution perspective. *Revista Ítalo-española de Derecho procesal*, *1*, 181–213. https://doi.org/10.37417/rivitsproc/859

Griffith, A., & Headley, J. D. (1995). Developing an effective approach to the procurement and management of small building works within large client organizations. *Construction Management and Economics*, *13*, 279–289. https://doi.org/10.1080/01446199500000033

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? an experiment with data saturation and variability. *Field Methods*, *18*, 59–82. https://doi.org/https://doi.org/10.1177/1525822X05279903

Guest, G., Macqueen, K. M., & Namey, E. E. (2012). *Applied thematic analysis*. Sage.

Halberda, J. (2020). The principle of good faith and fair dealing in english contract law. *Pravovedenie*, *64*, 312–325. https://doi.org/10.21638/spbu25.2020.301

Hall, M. (1999). *International construction management: The cultural dimension.* [Doctoral dissertation].

Hammersley, M., & Gomm, R. (2008). Assessing the radical critiques of interviews. Sage.

Hart, C. (2018). *Doing a literature review: Releasing the research imagination* (2nd ed.). Sage Publications. https://www.cuzproduces.com/producinganew/files/resources/HART_Doing%20a%20literature%20review_1988_ch1.pdf

Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. Sage Publications.

Hofstede, G. (1984). *Culture's consequences: International differences in work-related values*. Sage Publications.

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Sage Publications.

Hofstede, G. (2011). Dimensionalizing cultures: The hofstede model in context. *Online Readings in Psychology and Culture*, *2*, 1–26. https://doi.org/https://doi.org/10.9707/2307-0919.1014

Hofstede, G., Minkov, M., & Hofstede, G. J. (2010). *Cultures and organizations: Software of the mind: Intercultural cooperation and its importance for survival* (3rd ed.). McGraw-Hill.

Huang, Q., Lu, C., & Chen, K. (2017). Smart building applications and information system hardware co-design. *Elsevier eBooks*, 225–240. https://doi.org/10.1016/b978-0-12-809393-1.00011-8

Ibraheem, R. A. R., & Mahjoob, A. M. R. (2021). Facilitating claims settlement using building information modeling in the school building projects. *Innovative Infrastructure Solutions*, *7*. https://doi.org/10.1007/s41062-021-00646-2

Jacobs, A. F. J., & Meesters, J. W. A. (2022). *Juridische aspecten van samenlopende vertragingsoorzaken en inefficiëntie in de bouw*. Instituut voor Bouwrecht.

Jagtap, M., & Kamble, S. (2019). The effect of the client–contractor relationship on project performance. *International Journal of Productivity and Performance Management*, *ahead-of-print*. https://doi.org/10.1108/ijppm-05-2018-0205

Jordan, T. (2000, January). Glasl's nine-stage model of conflict escalation. *ResearchGate*. https://www.researchgate.net/publication/265452970_Glasl%27s_Nine-Stage_Model_Of_Conflict_Escalation

Kalogeraki, M., & Antoniou, F. (2024). Claim management and dispute resolution in the construction industry: Current research trends using novel technologies. *Buildings*, *14*, 967. https://doi.org/10.3390/buildings14040967

Karahanna, E., Evaristo, J. R., & Srite, M. (2005). Levels of culture and individual behavior. *Journal of Global Information Management*, *13*, 1–20. https://doi.org/10.4018/jgim.2005040101

Kim, E. W., Park, M. S., Kim, K., & Kim, K. J. (2022). Blockchain-based automatic tracking and extracting construction document for claim and dispute support. *KSCE Journal of Civil Engineering*, *26*, 3707–3724. https://doi.org/10.1007/s12205-022-2181-z

Koc, S., & Skaik, S. (2014, May). *Disputes resolution: Can bim help overcome barriers?*

Kraatz, M. S., & Block, E. S. (2008). Organizational implications of institutional pluralism. In R. Greenwood, C. Oliver, R. Suddaby, & K. Sahlin (Eds.). Sage.

Lee, C. K., Yiu, T. W., & Cheung, S. O. (2016). Selection and use of alternative dispute resolution (adr) in construction projects — past and future research. *International Journal of Project Management*, *34*, 494–507. https://doi.org/10.1016/j.ijproman.2015.12.008

Leung, K., Bhagat, R. S., Buchan, N. R., Erez, M., & Gibson, C. B. (2005). Culture and international business: Recent advances and their implications for future research. *Journal of International Business Studies*, *36*, 357–378. https://doi.org/10.1057/palgrave.jibs.8400150

Linneberg, M. S., & Korsgaard, S. (2019). Coding qualitative data: A synthesis guiding the novice. *Qualitative Research Journal*, *19*, 1–27. https://doi.org/10.1108/QRJ-12-2018-0012

Liu, Z., Ding, R., Gong, Z., & Ejohwomu, O. (2023). Fostering digitalization of construction projects through integration: A conceptual project governance model. *Buildings*, *13*, 825. https://doi.org/10.3390/buildings13030825

Maluccio, A. N., & Marlow, W. D. (1974). The case for the contract. *Social Work*, *19*, 28–36. https://doi.org/10.2307/23712162

Marathe, A., Hashem M. Mehany, M. S., Senior, B., & Strong, K. (2017). Dispute resolution and contract incentives: Perceptions of project stakeholders. *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, *9*, 04517019. https://doi.org/10.1061/(asce)la.1943-4170.0000243

Mason, M. (2010, August). Sample size and saturation in phd studies using qualitative interviews. *ResearchGate*. Retrieved October 2, 2024, from https://www.researchgate.net/publication/47408617_Sample_Size_and_Saturation_in_PhD_Studies_Using_Qualitative_Interviews

McKim, C. (2023). Meaningful member-checking: A structured approach to member-checking. *American Journal of Qualitative Research*, *7*, 41–52. https://doi.org/https://doi.org/10.29333/ajqr/12973

McKinsey & Company. (2018, January). Small doesn't mean unprofitable: Unlocking new value from small-to-medium metal and mining projects — mckinsey. *www.mckinsey.com*. https://www.mckinsey.com/industries/metals-and-mining/our-insights/small-doesnt-mean-unprofitable-unlocking-new-value-from-small-to-medium-metal-and-mining-projects

McKinsey & Company. (2020, June). The next normal in construction how disruption is reshaping the world's largest ecosystem. https://www.mckinsey.com/~/media/McKinsey/Industries/Capital%20Projects%20and%20Infrastructure/Our%20Insights/The%20next%20normal%20in%20construction/The-next-normal-in-construction.pdf

McQuoid-Mason, D. (2020). Could traditional dispute resolution mechanisms be the solution to reducing the volume of litigation in post-colonial developing countries – particularly in africa? *Oñati Socio-legal Series*, *11*. https://doi.org/10.35295/osls.iisl/0000-0000-0000-1145

Mergel, I., Edelmann, N., & Haug, N. (2019). Defining digital transformation: Results from expert interviews. *Government Information Quarterly*, *36*, 101385. https://doi.org/https://doi.org/10.1016/j.giq.2019.06.002

Minkov, M., & Kaasa, A. (2022). Do dimensions of culture exist objectively? a validation of the revised minkov-hofstede model of culture with world values survey items and scores for 102 countries. *Journal of International Management*, *28*, 100971. https://doi.org/10.1016/j.intman.2022.100971

Mofleh, I. (2021). Causes for delays in municipal projects in jordan: A case study of the zarqa municipality. *International Journal of Academic Research in Business and Social Sciences*, *11*, 1312–1319. Retrieved January 10, 2025, from http://dx.doi.org/10.6007/IJARBSS/v11-i7/10509

Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., Shekelle, P., & Stewart, L. A. (2015). Preferred reporting items for systematic review and meta-analysis protocols (prisma-p) 2015 statement. *Systematic Reviews*, *4*, 1–9.

Moradi, S., & Sormunen, P. (2023). Implementing lean construction: A literature study of barriers, enablers, and implications. *Buildings*, *13*, 556. https://doi.org/10.3390/buildings13020556

Murdoch, J., & Hughes, W. (2008). *Construction contracts : Law and management* (4th ed.). Taylor & Francis.

Naji, K. K., Mansour, M. M., & Gunduz, M. (2020). Methods for modeling and evaluating construction disputes: A critical review. *IEEE Access*, *8*, 45641–45652. https://doi.org/10.1109/access.2020.2976109

Neuman, W. L. (2014). *Social research methods: Qualitative and quantitative approaches* (7th ed.). Pearson.

Orb, A., Eisenhauer, L., & Wynaden, D. (2001). Ethics in qualitative research. *Journal of Nursing Scholarship*, *33*, 93–96.

O'Reilly, C. A., Chatman, J., & Caldwell, D. F. (1991). People and organizational culture: A profile comparison approach to assessing person-organization fit. *Academy of Management Journal*, *34*, 487–516. https://doi.org/10.2307/256404

Paaga, D. T., & Dandeebo, G. (2014). Assessing the appeal of traditional dispute resolution methods in land dispute management: Cases from the upper west region. *Developing Country Studies*, *4*, 1–9.

Palthe, J. (2014). Regulative, normative, and cognitive elements of organizations: Implications for managing change. *Management and Organizational Studies*, *1*.

Parchami Jalal, M., Yavari Roushan, T., Noorzai, E., & Alizadeh, M. (2020). A bim-based construction claim management model for early identification and visualization of claims. *Smart and Sustainable Built Environment*, *ahead-of-print*. https://doi.org/10.1108/sasbe-10-2019-0141

Parker, L. D. (2020). The covid-19 office in transition: Cost, efficiency and the social responsibility business case. *Accounting, Auditing & Accountability Journal*, *33*, 1943–1967. https://doi.org/10.1108/aaaj-06-2020-4609

Patel, P. (2021). Efficacy, effectiveness, and efficiency. *National Journal of Community Medicine*, *12*, 33–39.

Patton, M. Q. (2002). *Qualitative research & evaluation methods: Integrating theory and practice* (3rd ed.). Sage. https://aulasvirtuales.wordpress.com/wp-content/uploads/2014/02/qualitative-research-evaluation-methods-by-michael-patton.pdf

Peckham, S., Jane Dacre, D., Appleby, J., Charlesworth, A., & Francis, R. (2022). Enhancing the scrutiny role of select committees: The house of commons health and social care select committee's new independent expert panel. *Parliamentary Affairs*, *77*. https://doi.org/10.1093/pa/gsac025

Pejovic, C. (2001). Civil law and common law: Two different paths leading to the same goal. *Victoria University of Wellington Law Review*, *32*, 817. https://doi.org/10.26686/vuwlr.v32i3.5873

Pishdad-Bozorgi, P., & Yoon, J. H. (2022). Transformational approach to subcontractor selection using blockchain-enabled smart contract as trust-enhancing technology. *Automation in Construction*, *142*, 104538. https://doi.org/10.1016/j.autcon.2022.104538

Pradeep, A. S. E., Yiu, T. W., Zou, Y., & Amor, R. (2021). Blockchain-aided information exchange records for design liability control and improved security. *Automation in Construction*, *126*. https://doi.org/10.1016/j.autcon.2021.103667

Pretorius, C. (2004). The basis of contractual liability in dutch law. *Comparative and International Law Journal of Southern Africa*, *37*(3), 377–403. https://doi.org/10.10520/AJA00104051_85

Przeworski, A., & Teune, H. (1970). Research designs. Wiley. https://www.researchgate.net/publication/235413195_The_Logic_of_Comparative_Social_Inquiry

Rathnayake, I., Wedawatta, G., & Tezel, A. (2022). Smart contracts in the construction industry: A systematic review. *Buildings*, *12*, 2082. https://doi.org/10.3390/buildings12122082

Rendell, M. (2000). Adr versus litigation. *Dispute Resolution Journal*, *55*.

RICS. (2024, April). Appropriate contract selection.

Robson, C. (2002). *Real world research : A resource for social scientists and practitioner-researchers*. Braille Jymico Inc.

Roller, M. R., & Lavrakas, P. J. (2015). *Applied qualitative research design: A total quality framework approach*. The Guilford Press.

Root, D. (2002). Validating occupational imagery in construction; applying hofstede's vsm to occupations and roles in the uk construction industry. In D. Seymour & R. Fellows (Eds.). CIB.

Roxenhall, T., & Ghauri, P. (2004). Use of the written contract in long-lasting business relationships. *Industrial Marketing Management*, *33*, 261–268. https://doi.org/10.1016/j.indmarman.2003.10.015

Safinia, S. (2014). A review on dispute resolution methods in uk construction industry. *International Journal of Construction Engineering and Management*, *3*, 105–108. https://doi.org/10.5923/j.ijcem.20140304.01

Sayed-Gharib, T., Price, A., & Lord, W. (2010). Improving dispute resolution on construction projects in kuwait. *Business, Engineering, Law*, 514–526.

Sayer, P. (2011). Interviews in qualitative research by king, nigel, & christine horrocks. *The Modern Language Journal*, *95*, 670–671. https://www.academia.edu/27948728/Interviews_in_Qualitative_Research_by_KING_NIGEL_and_CHRISTINE_HORROCKS

Schein, E. H. (2010). *Organizational culture and leadership* (4th ed.). Jossey-Bass.

Schlesinger, R. B., Baade, H. W., Herzog, P. E., & Wise, E. M. (1988, April). *Comparative law: Cases, text, materials* (6th ed.). Foundation Press.

Schlesinger, R., Bonassies, P., & School, C. L. (1968). *Formation of contracts: A study of the common core of legal systems, conducted under the auspices of the general principles of law project of the cornell law school*. Oceana Publications. https://books.google.nl/books?id=ewIqAQAAMAAJ

Schoch, K. (2019, August). Case study research. Sage. https://uk.sagepub.com/sites/default/files/upm-assets/105275_book_item_105275.pdf

Schön, D. A. (2017, March). *The reflective practitioner* (1st ed.). Routledge. https://doi.org/10.4324/9781315237473

Scott, W. R. (2014). *Institutions and organizations : Ideas, interests and identities* (4th ed.). Sage Publications, Inc.

Shahhosseini, V., & Hajarolasvadi, H. (2018). A conceptual framework for developing a bim-enabled claim management system. *International Journal of Construction Management*, 1–15. https://doi.org/10.1080/15623599.2018.1512182

Siehl, C., & Martin, J. (1990). Organizational culture: A key to financial performance? Jossey-Bass.

Silverman, D. (2011, January). Qualitative research. *ResearchGate*. https://www.researchgate.net/publication/279187479_Qualitative_Research

Smith, J. A., Flowers, P., & Larkin, M. (2009). *Interpretative phenomenological analysis: Theory, method and research*. Sage.

Sonmez, R., Ahmadisheykhsarmast, S., & Güngör, A. A. (2022). Bim integrated smart contract for construction project progress payment administration. *Automation in Construction*, *139*, 104294. https://doi.org/10.1016/j.autcon.2022.104294

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks : Sage Publications. https://archive.org/details/artofcasestudyre0000stak

Sweiss, R. J., Bisharat, S. M., Bisharat, L., & Sweis, G. (2014). Factors affecting contractor performance on public construction projects. *Life Science Journal*, *11*, 28–39.

The Culture Factor Group. (2023). Country comparison tool. *Theculturefactor.com*. https://www.theculturefactor.com/country-comparison-tool?countries=netherlands%2Cunited+kingdom

Turner & Townsend. (2024). Annual review 2023 - 2024. *Turner & Townsend*. Retrieved October 18, 2024, from https://www.turnerandtownsend.com/about-us/annual-review/

UK Public General Acts. (2010). Law of property (miscellaneous provisions) act 1989. *Legislation.gov.uk*. https://www.legislation.gov.uk/ukpga/1989/34/section/2

UK Public General Acts. (2011). Contracts (rights of third parties) act 1999. *Legislation.gov.uk*. https://www.legislation.gov.uk/ukpga/1999/31/section/1

UK Public General Acts. (2012). Law of property act 1925. *Legislation.gov.uk*. https://www.legislation.gov.uk/ukpga/Geo5/15-16/20/section/52

United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. *United Nations*. https://sdgs.un.org/2030agenda

Unruh, G., & Kiron, D. (2017, November). Digital transformation on purpose. *MIT Sloan Management Review*. Retrieved October 1, 2024, from https://sloanreview.mit.edu/article/digital-transformation-on-purpose/

Vaidya, S., Ambad, P., & Bhosle, S. (2018). Industry 4.0 – a glimpse. *Procedia Manufacturing*, *20*, 233–238. https://doi.org/10.1016/j.promfg.2018.02.034

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, *122*, 889–901.

Wiles, R., Crow, G., Heath, S., & Charles, V. (2008). The management of confidentiality and anonymity in social research. *International Journal of Social Research Methodology*, *11*, 417–428. https://doi.org/10.1080/13645570701622231

Wilkinson, M. D., Dumontier, M., Aalbersberg, I. J., Appleton, G., Axton, M., Baak, A., Blomberg, N., Boiten, J.-W., da Silva Santos, L. B., Bourne, P. E., Bouwman, J., Brookes, A. J., Clark, T., Crosas, M., Dillo, I., Dumon, O., Edmunds, S., Evelo, C. T., Finkers, R., … Mons, B. (2016). The fair guiding principles for scientific data management and stewardship. *Scientific Data*, *3*. https://www.nature.com/articles/sdata201618

Wissink, M. H. (2020). Legal certainty and the construction of contracts in dutch law. *BW-krant Jaarboek*, *27*, 41–55. Retrieved December 13, 2024, from https://hdl.handle.net/1887/36710

Xiong, B., Skitmore, M., Xia, B., Masrom, M. A., Ye, K., & Bridge, A. (2014). Examining the influence of participant performance factors on contractor satisfaction: A structural equation model. *International Journal of Project Management*, *32*, 482–491. https://doi.org/10.1016/j.ijproman.2013.06.003

Xu, X., Lu, Y., Vogel-Heuser, B., & Wang, L. (2021). Industry 4.0 and industry 5.0—inception, conception and perception. *Journal of Manufacturing Systems*, *61*, 530–535. https://doi.org/10.1016/j.jmsy.2021.10.006

Ye, X., Zeng, N., & König, M. (2022). Systematic literature review on smart contracts in the construction industry: Potentials, benefits, and challenges. *Frontiers of Engineering Management*, *9*. https://doi.org/10.1007/s42524-022-0188-2

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage Publications.

Żemojtel-Piotrowska, M., & Piotrowski, J. (2023). Hofstede's cultural dimensions theory. *Encyclopedia of Sexual Psychology and Behavior*, 1–4. https://doi.org/https://doi.org/10.1007/978-3-031-08956-5_1124-1

Zuppi, A. (2007). The parol evidence rule: A comparative study of the common law, the civil law tradition, and lex mercatoria. *GEORGIA JOURNAL OF INTERNATIONAL AND COMPARATIVE LA*, *35*, 233–276.

A. The conflict escalation model of Glasl

Table A.1: *Stages of conflict escalation based on Glasl's model*

Stage	Conflict Issues	Behavioural Norms	In-group/Out-group Cognitions and Attitudes
1. Hardening	Objective issues, hardening standpoints	Straight argumentation	Awareness of mutual dependence, nascent role expectations, nascent in-/out-group formation, suspicions about hidden motives
2. Debates and Polemics	Objective issues, relative position, superiority, ability to influence	Verbal confrontations, tactical feints in argumentation, debates	Affinity inwards, fixation at standpoints, ambivalence between cooperation and competition, suspiciousness, counterparts exhibiting 'typical behaviour'
3. Actions, Not Words	Objective issues, self-image, freedom of action, proving one's own mastery, blocking the counterpart	Action without consultation, accomplished facts, symbolic behaviour (jargon), decreased verbal and increased non-verbal communication	Blocked empathy, 'counterpart not capable of development', in-group conformity pressure
4. Images and Coalitions	Counterpart as the problem, win or lose, save reputation	'Deniable punishment behaviour', exploitation of gaps in norms, formation of coalitions, attacks on core identity	Dual cognition (black/white), coherent enemy image, attribution of collective characteristics to counterpart, self-image as only reacting to counterpart

Continued on next page

Stage	Conflict Issues	Behavioural Norms	In-group/Out-group Cognitions and Attitudes
5. Loss of Face	Fundamental values, exposing counterpart, rehabilitating dignity	Attacks on the public face of the counterpart, restoring prestige	Enemy 'unmasked', perceived as morally corrupt, guilt symbiosis within the in-group
6. Strategies of Threats	Control of counterpart	Presentation of ultimatums, panic-ruled actions, self-binding statements, extension of conflict	Own actions seen as only reactions, perceived impotence leading to rage, need for control
7. Limited Destructive Blows	Hurting counterpart more than one's own group, survival	Attacks at sanction potential, threats with interrupted communication	Counterpart seen as prepared to do anything, counterpart perceived as not human, power-thinking dominates, malice becomes an important motive
8. Fragmentation of the Enemy	Annihilating the counterpart, survival	Attacks on vital functions, actions to shatter counterpart, attacks on cohesive function	Annihilation fantasies, fascination with mechanical annihilation mechanisms
9. Together Into the Abyss	Annihilation at any cost	Total war with all means, limitless violence	Acceptance of own destruction if the counterpart is also destroyed

B. Dispute artifacts of construction disputes

In this appendix the dispute artifacts of construction disputes and their defuzzified values as identified by Cheung and Pang (2013) are presented.

Table B.1: *Basic events for construction disputes in the task factor (Cheung & Pang, 2013).*

Task factor	**Dispute artifact**
Risk and Uncertainty	TR1: Inclement weather TR2: Change of government policy TR3: Strike TR4: Fluctuations in material price TR5: Fluctuations in labour cost TR6: Shortage of labour TR7: Shortage of materials TR8: Uncertain ground condition
Collaborative Conflict	TC1: Contractors employed directly by the client delays in works TC2: Nominated subcontractor delays in works TC3: Nominated supplier delays in works TC4: Architect fails to issue instruction within time TC5: Engineer fails to provide adequate site investigation details TC6: Consultant fails to give information within due time TC7: Client requests acceleration unreasonably TC8: Client requests change unreasonably

Table B.2: *Basic events for construction disputes in contract incompleteness (Cheung & Pang, 2013).*

Contract incompleteness	**Dispute artifact**
Ambiguity	CA1: The scope of work is unclear CA2: The specification is unclear CA3: The rules to evaluate star rate are unclear
Deficiency	CF1: The rules to evaluate substantial change in quantity of works are not addressed CF2: The drawings provide insufficient details
Inconsistency	CC1: The quantity of the same items in the contract bills are substantially different from the actual quantity CC2: Some items are missing from the contract bills CC3: The drawings contradict the specification
Defectiveness	CT1: The details in the drawings are inconsistent CT2: The drawings are inconsistent with the contract bills

Table B.3: *Basic events for construction disputes in the people factor (Cheung & Pang, 2013).*

People factor	Dispute artifact
Opportunistic behavior	PO1: Contractor purposely fails to notify omission of items in the contract bills of quantity PO2: Contractor purposely works below the specified standard PO3: Contractor purposely fails to notify the substantial difference in quantity between contract bills of quantity and actual quantity PO4: Client rejects outright extension of time claim submitted by the contractor PO5: Client rejects outright monetary claim submitted by the contractor PO6: Contractor overclaims costs for progress acceleration PO7: Contractor purposely fails to disclose the specification of the materials used PO8: Contractor purposely does not provide invoice for the materials used PO9: Client orders extra without providing proper cost reimbursement PO10: Client orders extra without granting justified extension of time
Affective conflict	PA1: Psychological distress such as fear, sadness, anger, and guilt are displayed by member(s) of the project team PA2: Emotions such as dominance, assertion, bullying, and forcefulness are displayed by member(s) of the project team PA3: Intellectually curious, behaviorally flexible, and liberal in their attitudes and values are qualities displayed by member(s) of the project team PA4: Hostility, callousness, and cynicism are manifested by member(s) of the project team PA5: Excessively neat or overly exact attributes are displayed by member(s) of the project team PA6: Certain member(s) of the project team find it difficult to relax PA7: Certain member(s) of the project team are nervous PA8: Certain member(s) of the project team are upset or agitated PA9: Certain member(s) of the project team are irritable or overactive PA10: Certain member(s) of the project team are impatient

C. Interview guide

Research: MSc thesis on digitalisation of dispute resolutions in small-scale construction projects
Institution: Delft University of Technology
Researcher: Hannah Kapper

Introduction
Thank you for taking part in this research on digitalisation of dispute resolutions, focusing specifically on how implement digitalisation in the dispute resolution process in small-scale construction projects. This research is part of my graduation thesis for the MSc track Construction Management and Engineering at the Delft University of Technology. The goal of this research is to give insight in how cultural differences shape digital dispute resolution practices and provide an advice on how to effectively implement digital technologies to improve the resolution process in small-scale projects.

Your role within this selected project in particular and your experience in comparable projects in general are of great value for this research. I am particularly interested in the following aspects:

1. Your professional background, function within the building project, and role in the project team;
2. Your view on the causes of the disputes experienced in the building project, the methods used to resolve the disputes and what your role was;
3. Your view on the possibilities and barriers of the implementation of digital tools for dispute resolutions in the building project.

Please note that there are no right or wrong answers, your personal view is what counts. The data you provide will not be used for any other purposes beyond this research. You are not obliged to answer all questions and you may withdraw from this research at any moment. This interview will take approximately 45 minutes.

1. **General**
   (a) What is your work experience in the building industry?
   (b) What was your role and the scope of your work within this project?
2. **Dispute resolution**
   (a) How would you describe your general experiences with disputes and resolving them?
   (b) How did you experience the disputes that occurred in this project?
   (c) According to you, what were the main causes for the disputes in this project?
   (d) How did the resolution process work?
   (e) How did your function affect your priorities in the resolution process?
3. **Digitalisation**
   (a) What is your experience with digitalisation of the dispute resolution process?
   (b) How do you think digitalisation can shape dispute resolution practices?

(c) How were digital tools used in the resolution process in this project?

(d) How would you describe the opportunities and barriers of digital dispute resolution practices?

4. **Effectiveness and efficiency**

(a) How would you define 'effective dispute resolution'?

(b) To which degree would you wish to increase the efficiency of the resolution process?

D. Brief description research purposes

It is generally known that construction projects tend to go over budget and undergo delays, which often lead to disputes between contractors and clients. Resolving of disputes related to delays can manifest themselves in additional costs that must also be allocated to the responsible party. Efficiency of the dispute resolution process is important to keep up with the project requirements. Therefore, in recent years, a surge of interest in the potential of digitalisation to enhance the resolution of disputes has been observed.

Although the literature shows that digitalisation of dispute resolution is proven to increase the efficiency of the process, reality shows that digitalising this process is easier said than done. Digital tools have been developed to support a more efficient dispute resolution process but are not yet widely applied in practice. Insufficient research has been conducted on how digital tools for dispute resolution should be shaped to be in accordance with effective use in practice. This research aims to identify how culture shapes digital dispute resolution practices in order to develop an effective advice for an improved resolution process in small-scale construction projects.

For this study, I will conduct a comparative case study in which I will examine the dispute resolution practices. I will do this by conducting interviews with stakeholders with different roles to determine how digital tools should be shaped to be used in practice. For my thesis research, I am looking for stakeholders in the project that are willing to participate as an interviewee.

Important note: all participants and relevant information in this study will remain anonymous. All relevant company information and personal data will be anonymised, and all participants will be required to sign an informed consent form. (Additional efforts are taken to protect the privacy of participants, and the TU Delft research team, consisting of the research and the research's supervisors, controls the research content.)

E. Information sheet interview

Research: MSc thesis on digitalisation of dispute resolutions in small-scale construction projects
Institution: Delft University of Technology
Researcher: Hannah Kapper
Date: 16/10/2024 [DD/MM/YYYY]

In this information sheet, all aspects of taking part in this research for you as an interviewee are explained. After reading this, you are kindly requested to fill out the informed consent form. If you have any questions or concerns, please let me know.

Taking part in the research
You are being invited to participate in a research study titled 'Digitalisation of Dispute Resolutions'. The purpose of this research is to contribute to a graduation thesis written to complete the MSc track Construction Management and Engineering at the Delft University of Technology (TU Delft). This study is being done by Hannah Kapper from the TU Delft in collaboration with the company Turner & Townsend, with the office located in Amsterdam, the Netherlands.

The aim of this research is to determine how digital technology should be shaped to be used effectively to improve the dispute resolution process in small-scale construction projects. The study focuses on the causes of the disputes experienced, the methods used to resolve the disputes, and how digital tools were used or could have been useful to resolve those disputes more effectively. By participating in this research, you will contribute data on how your role and professional experiences shape digital dispute resolution practices, in order to determine an effective advice that can be implemented in practice.

This research tries to answer how culture can shape digital dispute resolution practices. For that reason, a comparative case study is carried out where two projects of different countries are selected. You have worked on a building project (a case) that I would really like to know more about through an interview with you. The interview will approximately take 45 minutes in which I will ask you questions related to the following subjects:

1. Your professional background and role within the building project and the project team;
2. Your view on the causes of the disputes experienced in the building project, the methods used to resolve the disputes and what your role was;
3. Your view on the possibilities and barriers of the implementation of digital tools for dispute resolutions in the building project.

The interview will be audio recorded in case of the interview being in person. In case the interview is online, the interview will be video recorded via Teams (including audio). Please note that there are no right or wrong answers, and you are not obliged to answer all questions. Your participation in this study is entirely voluntary and if you wish to withdraw from this research at any moment during the interview or after the interview has been conducted, you are able to do so. In this case, please inform me as soon as possible.

Usage of the data during the research

As with any (online) activity, there is a risk of data breach. I will do my best to keep your answers confidential. I minimise the risks by removing personal data as soon as possible. During an online interview, the Teams meeting will be recorded and automatically transcribed. If the interview is in person, the audio will be recorded with my phone. Afterwards, based on the video or audio recording, the transcription will be improved and shared with you to review to ensure that no sensitive information is included. If no comments on this are received, the recording will be deleted, and the transcript anonymised. The non-anonymised data will be stored in separate folders in a safe location on my personal TU Delft OneDrive and will be deleted as soon as possible. This will most likely be after the thesis is completed. From the anonymised transcripts, quotes could be included in the report. The anonymised transcripts will not be included in my thesis, but possibly a summary of the interview written by myself is, reducing the risk of being identifiable. Information regarding your role within the building project and the country your work in will have to remain explicit because these are main variables within the case study research. Personal information that could identify you, such as your name, will not be shared to other people than me and my first supervisor of the TU Delft.

Turner & Townsend will provide the initial contact between me and you. After this, Turner & Townsend will not be included in any future contact and will not have access to any non-anonymised data.

Future use and reuse of data by others
Future use and reuse of data by others after the research has been executed and the thesis has been finalised and handed in, it will be published and archived in the TU Delft education repository so it can be used for future research and learning. Data taken from the interview will be part of this publication. As a participant, you have the right to demand rectification or erasure of personal data. Please contact me through the contact details provided below if you have any questions or concerns regarding this.

Thank you very much for your cooperation and contribution to this research!

Kind regards,

H. L. (Hannah) Kapper
Email (university): H.L.Kapper@student.tudelft.nl
Email (company): Hannah.Kapper@turntown.com

Informed consent form

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICPANT TASKS AND VOLUNTARY PARTICIPATION		
I have read and understood the study information dated 16/10/2024, or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
I understand participation in this study means the following: • This interview will be recorded (in audio and video) and an automatic transcription will run when the interview is conducted online an will be corrected manually • This interview will be recorded (in audio) and a transcript will be made manually when the interview is conducted in person • The transcription will be sent to me for review • The recordings of the interview will be deleted 10 days after sending the transcription, unless there are still objections to the transcription. • The transcription will be made anonymous and quotes from it can be used in the report. • The originally non-anonymised transcription will be deleted immediately after anonymisation.	☐	☐
I understand that my participation to this study will not be compensated.	☐	☐
I understand that the study is expected to end in March 2025.	☐	☐
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
I understand that taking part in the study involves collecting specific personally identifiable information (PII), namely: name, email address, phone number, other contact details for digital communication, video and audio recordings of the interview, role within the project, and the country you work in. I understand that taking part in the study involves collecting associated personally identifiable research data (PIRD), namely: the data collected from the interview. I understand the potential risk of data breaches that could lead to my identity being revealed.	☐	☐
I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach: • The data will be anonymised as soon as possible; • The non-anonymised data will be stored in a separate folder from the anonymised data.	☐	☐

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
I understand that the signed informed consent form will be shared with the first supervisor of the TU Delft of the Researcher (Hannah Kapper) order for it to be stored for at least 10 years at the TU Delft, in accordance with the TU Delft Research Data Framework Policy.	☐	☐
I understand that personal information collected about me that can identify me, such as name, contact details, and video and audio recordings, will not be shared beyond the study team.	☐	☐
I understand that the (identifiable) personal data I provide will be destroyed at the latest when the report is published.	☐	☐
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		
I agree that my responses, views or other input can be quoted anonymously in research outputs.	☐	☐
D: (LONGTERM) DATA STORAGE, ACCESS AND REUSE		
I give permission for the de-identified data retrieved from the transcripts that I have provided by means of the interviews are to be archived in the TU Delft education repository so it can be used for future research and learning.	☐	☐
I understand that access to this repository is publicly available.	☐	☐
E: PROCESSING OF THE DATA		
I give consent to the processing of the recordings and the answers provided in the interviews for the purposes as described in this research.	☐	☐

Signatures

_____	_____	_____
Name of participant	Signature	Date

I, as researcher, have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

Hannah Kapper		28/11/2024
Researcher name	Signature	Date

Study contact details for further information:

Name: Hannah Kapper

Phone: +31653970809
Email (university): H.L.Kapper@student.tudelft.nl
Email (company): Hannah.Kapper@turntown.com

F. List of interviewees

Case	Organisation	Role	Date	Method
A	Turner & Townsend	Project manager	12/12/2024	Face-to-face
A	Turner & Townsend	Cost manager	28/01/2025	Face-to-face
A	Client	Purchase director	11/12/2024	Video call
A	Architect	Associate partner	20/12/2024	Video call
A	Contractor	Account manager	18/12/2024	Video call
B	Turner & Townsend	Cost manager	23/12/2024	Video call
General	Turner & Townsend	Project manager	06/02/2025	Video call

G. Processed interviews

In this appendix the processed interviews can be found. Note that the transcripts of the interviews have not been included in this repository version of the thesis. If you wish to access this information, please contact the author.

G.1 Case A

This section includes all the processed interviews from the selected case A. Note that the interviews with the project manager, the client, the contractor, and the architect of this case were conducted in Dutch, but are translated to English for the sake of this report. Please contact the author if you wish to have access to the processed interviews in the original source language.

G.1.1 Project manager

G.1.2 Cost manager

G.1.3 Client X

G.1.4 Contractor Y

G.1.5 Architect Z

G.2 Case B

This section includes the processed interviews from the selected case B.

G.2.1 Cost manager

G.3 General

This section includes the processed interviews conducted with interviewees that were not involved in either case studies. Only general information about national differences was obtained from these interviews.

G.3.1 Project manager

H. Information sheet expert panel meeting

Research: MSc thesis on digitalisation of dispute resolutions in small-scale construction projects
Institution: Delft University of Technology
Researcher: Hannah Kapper
Date: 30/01/2025 [DD/MM/YYYY]

Dear participant,

Thank you for taking part in this research on digitalisation of dispute resolution, focusing specifically on how culture can shape digital dispute resolution practices in small-scale construction projects. This research is part of my graduation thesis for the MSc track Construction Management and Engineering at the Delft University of Technology. The aim of this research is to gain insight in how digital dispute resolution practices can be shaped based on cultural aspects and provide an advice how to effectively implement digital tools in the resolution process in small-scale construction projects. Below, a brief description of this research is described, as well as the purpose of the expert panel meeting.

Brief description of the research
The literature already contains extensive research on dispute resolution, the causes of disputes, and various methods for resolving them. Recent developments in the past few years have focused on the digitalisation of the dispute resolution process, such as the use of BIM. However, there is still a lack of research on how digitalisation can be successfully implemented in practice.

For this reason, this study aims to explore how culture can shape digital dispute resolution practices to provide recommendations on how digital tools can be effectively used in practice, with a focus on small-scale projects. To understand the influence of culture on these practices, a comparative case study was conducted on two projects — one in the Netherlands and one in England.

For each case, stakeholders with different roles within the project were interviewed to capture multiple perspectives and to provide a holistic recommendation. These interviews formed the basis of the comparative case study, from which the research findings were derived.

Purpose expert panel meeting
You are a professional in the construction industry and have expert knowledge on working both in England and the Netherlands, which are the two countries that are compared in this research. During the expert panel meeting, I will share with you the findings of my research and pose them to you in the form of statements. I will explain the statements, after which we will openly discuss them. The discussion serves to provide me with practical insights on my findings and to structure my recommendations for practitioners. Please note that there are no right or wrong answers, your view and opinion are important.

If you have any questions before the panel meeting takes place, please reach out.

Kind regards,

H. L. (Hannah) Kapper
Email (university): H.L.Kapper@student.tudelft.nl
Email (company): Hannah.Kapper@turntown.com

Informed consent form

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICPANT TASKS AND VOLUNTARY PARTICIPATION		
I have read and understood the information provided in the information sheet dated 30/01/2025, or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions, and I can withdraw from the study at any time, without having to give a reason.	☐	☐
I understand participation in this study means the following: • This interview will be recorded (in audio and video) and an automatic transcription will run when the interview is conducted online an will be corrected manually • This interview will be recorded (in audio) and a transcript will be made manually when the interview is conducted in person • The transcription will be sent to me for review • The recordings of the interview will be deleted 10 days after sending the transcription, unless there are still objections to the transcription. • The transcription will be made anonymous and quotes from it can be used in the report. • The originally non-anonymised transcription will be deleted immediately after anonymisation.	☐	☐
I understand that my participation to this study will not be compensated.	☐	☐
I understand that the study is expected to end in March 2025.	☐	☐
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
I understand that taking part in the study involves collecting specific personally identifiable information (PII), namely: name, email address, phone number, other contact details for digital communication, video and audio recordings of the interview, role, and years of working experience. I understand that taking part in the study involves collecting associated personally identifiable research data (PIRD), namely: the data collected from the expert panel meeting. I understand the potential risk of data breaches that could lead to my identity being revealed.	☐	☐
I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach: • The data will be anonymised as soon as possible; • The non-anonymised data will be stored in a separate folder from the anonymised data.	☐	☐
I understand that the signed informed consent form will be shared with the first supervisor of the TU Delft of the Researcher (Hannah Kapper) order for it to be stored for at least 10 years at the TU Delft, in accordance with the TU Delft Research Data Framework Policy.	☐	☐

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
I understand that personal information collected about me that can identify me, such as name, contact details, and video and audio recordings, will not be shared beyond the study team.	☐	☐
I understand that the (identifiable) personal data I provide will be destroyed at the latest when the report is published.	☐	☐
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		
I agree that my responses, views or other input can be quoted anonymously in research outputs.	☐	☐
D: (LONGTERM) DATA STORAGE, ACCESS AND REUSE		
I give permission for the de-identified data retrieved from the transcripts that I have provided by means of the interviews are to be archived in the TU Delft education repository so it can be used for future research and learning.	☐	☐
I understand that access to this repository is publicly available.	☐	☐
E: PROCESSING OF THE DATA		
I give consent to the processing of the recordings and the answers provided in the panel meeting for the purposes as described in this research.	☐	☐

Signatures

_____	_____	_____
Name of participant	Signature	Date

I, as researcher, have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

Hannah Kapper		05/02/2025
Researcher name	Signature	Date

Study contact details for further information:
Name: Hannah Kapper
Phone: +31653970809
Email (university): H.L.Kapper@student.tudelft.nl
Email (company): Hannah.Kapper@turntown.com

I. Preparation expert panel

The expert panel consisted of three Turner & Townsend employees with experience working in both England and the Netherlands, see the overview below. They were provided with the information in this appendix as preparation for the panel session. Note that the transcript of the expert panel meeting has not been included in this repository version of the thesis. If you wish to access this information, please contact the author.

Research: MSc thesis on digitalisation of dispute resolutions in small-scale construction projects
Institution: Delft University of Technology
Researcher: Hannah Kapper
Date: 11/02/2025 [DD/MM/YYYY]

Agenda
15.00 Welcome and introduction
15.10 Introduction research
15.20 Start debate statements
15.55 Questions and feedback
16.00 Closing

Statements

I. If the project management organisation promotes the use of digital technologies, client and contractor organisations are more likely to be open to using those technologies.

II. If trust in a digital system to make a fair and reasonable assessment is enhanced, it can replace the human connection is dispute resolution practices.

III. An effective design feature for digital dispute resolution is when technical information is kept between the contractor and the architect, and the project manager only informs the client of this information.

Summary of the research

Problem statement
Disputes are common in all aspects of the construction industry and have led to a common interest in understanding the nature of the causes and developing measures to prevent or resolve them. In recent years, a surge of interest in the potential of digitalisation to enhance the resolution of disputes has been observed. Though digitalisation has proved to increase the efficiency of dispute resolution processes it is not yet widely applied in practice.

Practice shows that stakeholder interests and preferences are the most important factors for the successful implementation of dispute resolution method. Culture has the ability to shape behaviour, and therefore practices, of individuals and groups of people, but it has not yet been extensively researched how this works. Currently, there is a gap in knowledge on how culture within the building industry influences the successful implementation of digital dispute resolution practices.

Research question and approach

The research question that links to the above problem is formulated as follows: 'How can culture shape digital dispute resolution practices?' A literature review and empirical research were applied to answer this question.

A comparative case study was conducted on two small-scale projects—one in the Netherlands and one in England. Both projects were commercial real estate office fit-out projects. In total, seven stakeholders were interviewed, including the project and cost managers, the client, the contractor, and the architect. This way, both national differences as well as organisational and role-specific interests are identified.

Goal of the research
The deliverable of this research will be insight in and advice on how to effectively implement digital technologies in dispute resolution practices, based on cultural preferences. The eventual goal of this research is to give the building industry insight in how to improve the dispute resolution process in small-scale projects.

If there are any questions before the panel meeting, please reach out.

Kind regards,

H. L. (Hannah) Kapper
Email (university): H.L.Kapper@student.tudelft.nl
Email (company): Hannah.Kapper@turntown.com

J. Processed expert panel meetings

In this appendix, the transcribed discussions of the expert panel meetings can be found. Note that the transcripts of the discussions have not been included in this repository version of the thesis. If you wish to access this information, please contact the author.

J.1 Panel meeting expert 1 and 2

J.2 Panel meeting expert 3