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Improving tender performance: creating awareness by steepening the learning curve

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Improving tender performance: creating awareness by steepening the learning curve

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ABSTRACT: The construction market in the Netherlands shows a shift towards collaborative contracting. This type of procurement is considered as a significant change for contractors since they are forced to present themselves in a different way during tendering procedures. Successful tendering requires therefore a development of soft skills and the ability to communicate these skills in tenders. In this project-based and competitive environment, steep learning curves provide advantages towards competitors. Nevertheless, learning is not a strong competence of the construction industry. This research investigates a Dutch contractor´s approach to this challenge and reflects on the contractor´s tender processes and strategies from different learning perspectives. Findings show that the inter-tender couplings across sequential tenders and the inter-tender couplings related to clients are still loose since there is a strong focus on separate tenders. Separate tenders are mostly perceived as ´islands´ and knowledge sharing is generally based on the sender/receiver approach. The tightening of inter-tender couplings related to clients require long-term client-contractor relationships to constantly identify the gap between desired skills and evolved skills. In addition, the tightening of inter-tender couplings across sequential tenders requires a social learning approach to consistently encourage the development of these skills. Eventually, contractors need to shift from single-loop learning to double-loop learning in order to become self-aware of their skills, the gap between desired skills and evolved skills and their skills development.

KEYWORDS: Construction Industry; Collaborative Contracting; Construction Design Team; Learning in Tenders; Tender Performance;

1. Introduction

The Dutch construction industry moves increasingly from competition-based contracts towards cooperation-based contracts. The form of government and the balance between competition and cooperation is highly affected by the procurement choices of the client (Eriksson, 2008). A typical example of a collaborative contract is the construction design team (CDT) contract. In this type of contract, client and contractor collaborate during the design phase of the project and the contractor is entitled to provide an offer for the construction phase initially (Hoevink, n.d.). During CDT tenders, clients desire to select one contractor out of a limited selection of contractors for the design phase of the project. These tenders differ from tenders for traditional or integrated contracts since CDT tenders primarily focus on soft skills and price is often of minor importance. This development forces contractors to focus on soft skills and the ability to present their soft skills in tenders. To create competitive advantage in tendering procedures, contractors should learn faster than their competitors (Kululanga , Price, & McCaffer, 2002; Geus, 1988). In a loosely coupled and project-based construction industry, learning appears to be difficult and underdeveloped because of the loose couplings between several entities (Dubois & Gadde, 2002). The level of interdependence and the amount of re-used resources indicate the tightness of these couplings (Dorée & Holmen, 2004). Although learning occurs in many various ways and at different levels, this study is confined to the model of single-loop and double-loop learning (Argyris & Schon, 1978) and the sender/receiver concept and the social learning approach (Hartmann & Dorée, 2015).

The main aim of this research is to investigate a contractor's approach towards learning between CDT tenders. This study reflects on the contractor's inter-tender couplings across sequential tenders and the inter-tender couplings related to clients from different learning perspectives. Qualitative data is obtained from a document study including six different CDT tender ranges and from 21 semi-structured interviews with several persons from various functions within the research organisation. These results are validated during an expert session with seven managers of the investigated construction company.

In the next section, an overview of the contextual background of this study is given including a theoretical framework. Following this, the methodology of this research is elaborated. The results concern a Dutch Contractor who has the challenging task to learn between CDT tenders in order to enhance their market position. This approach is reflected in the discussion from different learning perspectives and the conclusion provides the main lessons learned for the construction industry.

2. Theoretical background

This section describes the context of the research by providing theoretical background information. A general description of the industry context is used to explain the features and the reasons for the low level of learning in the construction industry. Secondly, the shift from competition-based contracts towards cooperation-based contracts is described and the concept of CDT contracts is presented. Thereafter, learning between tenders is introduced by elaborating on organisational learning and the interrelated couplings in the construction industry.

2.1 The industry context

The construction industry has several typical features. First and foremost, the industry has a strong focus on single projects which results in decentralized decision-making. Besides this, each project and its geographical project location are unique. Local adjustments are therefore conventional and necessary (Dubois & Gadde, 2002). Weick (1976) engaged several industries as loosely coupled systems and Dubois & Gadde (2002) stated that the construction industry can also be approached as an industry with predominately loose couplings between firms and projects. The loose couplings between the projects and other firms seems convenient because the industry must deal with the high complexity and especially the tight couplings within the projects (time and budget constraints). However, short-term project focus,

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time constraints and loose couplings within construction firms do not encourage learning (Dubois & Gadde, 2002).

The industry can also by typed as a complex systems industry (Winch, 1998; Rutten, Dorée, & Halman, 2009) which produces complex product systems (CoPS) identified by Miller et al. (1995). In this kind of industry there is a high level of interdependence between components and clients are highly committed. The model of Miller et al. (1995) for complex systems industries consists of three different levels: infrastructure, systems integrators and superstructure. The infrastructure represents the suppliers and subcontractors. The superstructure includes clients, governments and regulatory institutions. These two levels are connected by the systems integrators who are mainly responsible for the proper integration between the two (Miller, Hobday, Leroux-Demers, & Olleros, 1995). In the construction industry, the main contractor and the architects belong to the systems integrators and should be perceived as mediators. It is their responsibility to acquire knowledge about industry regulations and client requirements on the one hand and integration of sub-components on the other hand (Winch, 1998).

Project-based industries require a different form of learning than volume production industries. The features of the construction industry could additionally obstruct the correct implementation of organisational learning. Besides this, transformations are generally difficult to implement in a conservative industry. These characteristics are important to bear in mind when investigating the potential of organisational learning in construction.

2.2 The Construction Design Team

The public procurement methods in the Netherlands came under pressure in 2002 after a documentary revealed the widespread collusion in the Dutch construction industry. Dutch reform initiatives proposed tougher procurement environments and are based on a neo-classical perspective: *competition is good*. However, this recipe overlooks the dynamics of the market and might be counterproductive (Dorée A. , 2004). Dorée (2004) stated that the trend should be towards a cooperative, value and quality-driven procurement environment with integrated team delivery. The reform initiatives mainly focus on static efficiency (short-term). However, dynamic efficiency (long-term) should never be overlooked since the construction industry is highly dynamic and variable (Dorée, Holmen, & Caerteling, 2003). Boes and Dorée (2013) investigated a cooperation pilot project in the Netherlands and addresses the dynamics and potential of collaborative problem-solving. They concluded that this process requires further attention but early contractor involvement and collaboration improved the project design considerably compared to the initial design.

Currently, the construction market in the Netherlands moves towards collaborative contracting. The CDT is a typical example of a collaborative contract. This type of contract is divided into two different phases: the design phase and the construction phase. During the design phase contractors, clients and consultants closely collaborate and create a collective design. In this stage, the contractor and the consultant counsel the client and provide technical or specific knowledge. After the final design is established, the involved contractor is entitled to provide an offer for the construction phase initially (Hoevink, n.d.). Figure 1 presents two variations of CDT contracts with two legal foundations. In the first contract variation, a basic and detailed design is created collectively by the client, contractor and consultant (CDT) and the construction phase is executed under UAC by the contractor. In the second contract variation, only a shared basic design is created (CDT) and the detailed design and construction phase are executed under UAC-IC by the contractor (Merema, 2020). Although these are two main variations, many different variations exist within CDT contracts. Besides this, a CDT contract is one of the several variations of two-phase contracts. CDT contracts are often deployed when collaboration in one particular project is required. Other forms of two-phase contracts, such as framework agreements and area contracts, are generally used when one contract comprises multiple projects (CROW, 2020).

The tendering procedures of CDT contracts also differs from traditional or integrated contracts. This procedure starts with the selection of approximately five contractors which subsequently can tender for the design phase of the project. After the selection of one contractor, both parties enter into a CDT contract. When the design and joint specifications are created, the selected contractor is given an opportunity to make an offer for the construction phase. After the approval of this offer by the client, both parties enter into a new contract for the construction phase: a traditional (UAC) or an integrated (UAC-IC) contract. This research merely focuses on the selection procedure for the design phase of the project.

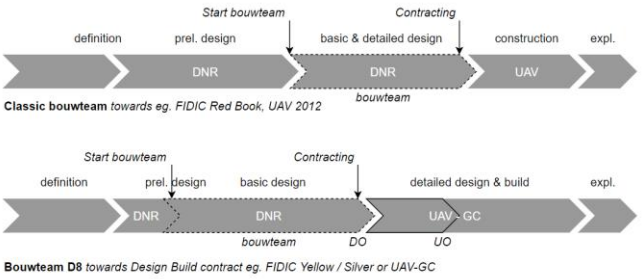

Figure 1 Legal foundations for CDT contracts (Merema, 2020)

2.3 Coopetition based procurement

The shift towards collaborative contracting and procurement is also investigated by Eriksson (2008). This researcher examined how the balance between competition and cooperation in client-contractor relationships is influenced by the procurement procedures of construction clients. The simultaneous competitive and cooperative behaviour of the involved parties and the continuum between competition and cooperation is perceived as coopetition (Brandenburger & Nalebuff, 1996).

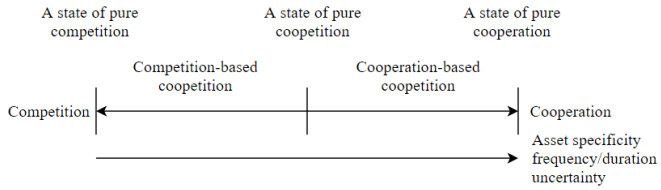

Figure 2 The competition-cooperation continuum (Eriksson, 2008)

The competition-cooperation continuum (Eriksson, 2008) is graphically presented in Figure 2. This model is based on a transaction cost economics (TCE) perspective. Competition should concentrate on standardised transactions with a low level of uncertainty while cooperation should focus primarily on complex transactions with a high level of uncertainty (Williamson, 1985). Clients' procurement choices during the buying process are influencing the form of governance. Generally, clients apply three different types of control to manage their bidders: output control, process control and social control (Eriksson, 2006; Aulakh, Kotabe, & Sahay , 1996; Ouchi, 1979). Output control is strongly related to competition, process control is related to competition-based coopetition and social control focuses on cooperation. These types

of control are engaged in each stage of the buying process: specification, bid invitation, bid evaluation, contract formalization, compensation, collaborative tools and performance evaluation (Eriksson, 2008).

Within the literature there is a difference between cooperation and collaboration. Eriksson (2008) merely distinguishes between competition and cooperation. Cooperation concentrates on separate responsibilities in one team and each team member supports the goals of others whereas collaboration focuses on shared responsibilities and the team has a shared vision (Power, 2017). The design phase of CDT contracts can be perceived as collaborative since the CDT has one vision and shared responsibilities. The construction phase is cooperative in nature since both parties support each other's goals but have different responsibilities. With joint specifications (with partly shared and partly separate responsibilities), a limited bid invitation, a high weight on soft parameters, an informal contract coupled with relational norms, including incentives for compensation, a high extent of collaborative tools and a performance evaluation by both the client and contractor, a CDT contract can be considered as a form of cooperation-based collaboration. Since this research focuses on the design phase of CDT contracts, collaboration is used as definition.

2.4 Learning in a loosely coupled construction industry

Different than other industries, the construction industry is mainly project-based and can be characterized by its decentralized decision-making process (Dubois & Gadde, 2002). Dubois and Gadde (2002) perceived the construction industry as a loosely coupled system and identified four different couplings between firms, projects and resources:

- Type-1: couplings between (the resources and activities of) different construction companies within single construction projects;
- Type-2: couplings related to firms involved in supply chains, i.e. manufactures (of materials, components, equipment etc.) and distributors – *within or across* projects;
- Type-3: couplings across parallel or sequential construction projects within a single construction company, and
- Type-4: interfirm couplings beyond the scope of individual project, i.e. between different construction firms across project (Dubois & Gadde, 2002, p. 624).

According to Dubois and Gadde (2002) type-1 couplings are tight, type-2 couplings are tight and loose and type-3 and type-4 couplings are loose. The tightness of each coupling indicates the level of interdependence between the different entities. Based on this perspective, Dorée and Holmen (2004) made a distinction between type-1a (among construction firms) and type-1b (between clients, advisors and construction firms), type-2a (intra-project couplings) and type-2b (inter-project couplings) and type-3a (couplings between parallel projects) and type-3b (couplings between sequential projects). From a tender learning perspective and the context of this research, type-1b and type 3-b couplings seem highly relevant.

The coupling between client and contractor (type-1b) is strongly related to the contractor's role as systems integrator. Contractors are mainly responsible to satisfy clients' needs and to fulfil client requirements (Winch, 1998). In a constantly changing market, it is difficult to uncover client needs and interpret client requirements. Misalignment between clients' expectations and project work, may be the result of a lack of understanding. A better understanding of client demands could be enhanced by using past experiences and learning (Love, Huang, Edwards, & Irani, 2004). However, some past experiences, such as client communication and negotiations strategies, are difficult to codify and to store (Ozorhon, Dikmen, & Birgonul, 2005). In the context of the proposed research, the concept of organisational learning could significantly contribute to create advantage in a competitive environment.

Learning is particularly important in sequential projects rather than in parallel projects. Sequential project couplings (type-3b) indicate the progressive development of resources including personnel, knowledge, contacts and equipment. These couplings can be both backwards oriented (past projects) and forwards (future projects) oriented (Dorée & Holmen, 2004). Besides, learning stimulates continuous improvement and might result in a competitive advantage (Kululanga , Price, & McCaffer, 2002). De Geus (1988) stressed that sustainable competitive advantage is obtained by learning faster than the competitors of the company. Furthermore, contractors who utilize their experiences in bidding processes are more successful and competitive than inexperienced contractors (Fu, Drew, & Lo, 2003). Thus, contractors could utilize tight couplings across sequential projects to increase their learning ability.

2.5 Learning perspectives and methods

Although learning occurs in many different ways and can be viewed from different perspectives, this research concentrates on single-loop and double-loop learning and the sender/receiver approach and the social learning approach.

The 'single-loop' learning and 'double-loop' learning model is developed by Argyris and Schon (1978). This model is utilized as the basis for many conceptual organisational learning models (Easterby-Smith & Nicolini, 2000) and is presented in Figure 3. Single-loop learning concerns problem-solving and correction of errors in the internal or external environment of the organisations. Double-loop learning relates to revaluating the organisational norms and goes one step further (Barlow & Jashapara, 1998). Besides this, single-loop learning is a more simplistic approach and tends to focus on obvious problems or consequences, for example profits. Conversely, double-loop learning investigates the underlying causes of the actual problem (Kululanga, Edum-Fotwe, & McCaffer, 2001). Single-loop learning is just solving the 'symptoms' of a certain problem (Senge, 1990). The feedback loops within the models should be utilized by the organisation to inform future decisions (Love, Huang, Edwards, & Irani, 2004). Particularly for double-loop learning and learning in the conservative construction industry, unlearning is important since traditional approaches could obstruct the implementation of new approaches (Barlow & Jashapara, 1998).

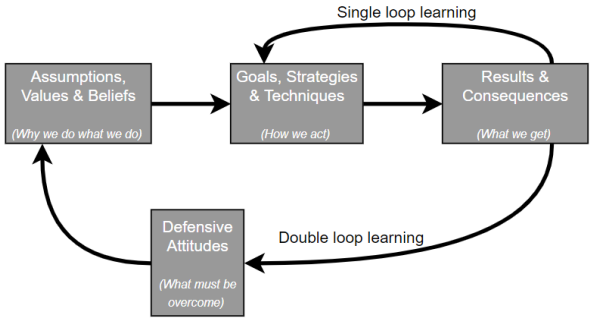

Figure 3 Single-loop and double-loop learning (Argyris & Schon, 1978)

Nearly all learning and knowledge management methods are particularly based on the sender/receiver concept. This approach

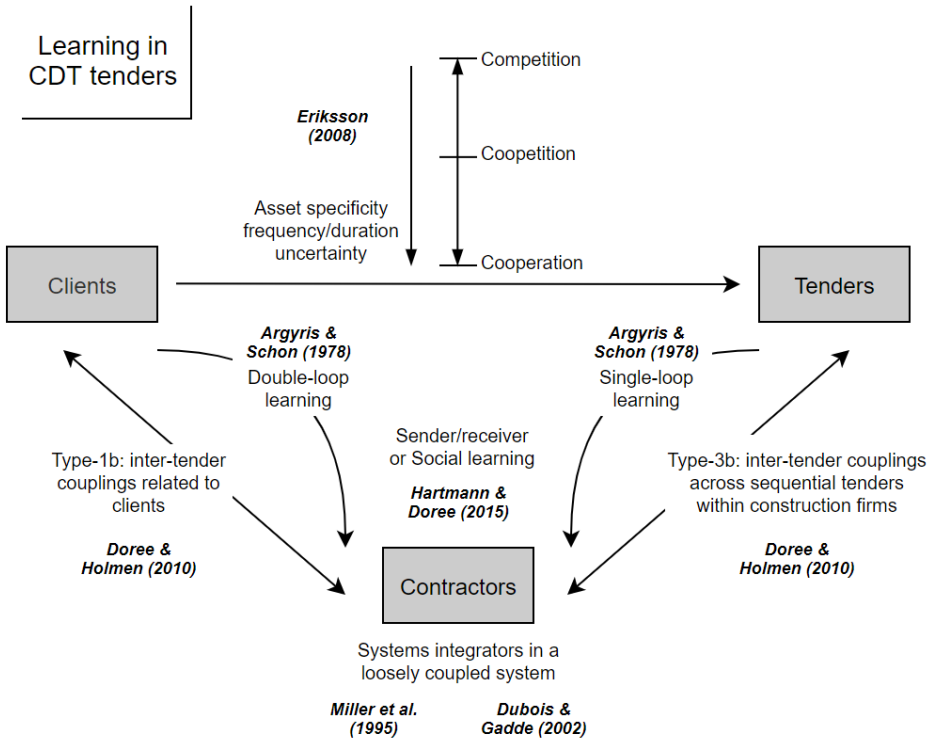

Figure 4 Theoretical framework

presumes that knowledge can be transferred from one unit to another unit under certain conditions. First of all, "the sender unit is knowledgeable and willing to share its knowledge. Secondly, the receiving unit possess the capacity to absorb the knowledge. Finally, the appropriate transmission channels between sender and receiver for the flow of knowledge exist" (Hartmann & Dorée, 2015, p. 342). Various communication channels, IT infrastructure and knowledge platforms are necessary to enhance the proper management of knowledge. Hartmann and Dorée (2015) stated that a sender/receiver approach implies several limitations in the construction industry. Sending knowledge requires time and the sender needs to determine which knowledge could be relevant for future projects. In addition, the receiver also needs to determine which sent knowledge is relevant for the current project. Sent knowledge becomes "messages in bottles" when projects are perceived as islands. Hartmann and Dorée (2015) proposed a social learning approach to encourage project learning. Moreover, social learning suggests that learning is related to the interaction between individuals instead of taking place in individuals minds (Easterby-Smith & Nicolini, 2000). Bakker et al. (2011) also stressed the importance of social practices in order to enhance project learning. Furthermore, focus and orientation is considered as essential in learning from projects (Hartmann & Dorée, 2015).

2.4 Theoretical framework

Based on the previous literature review, a theoretical framework is created in order to visualise the context of learning in CDT tenders. This framework is presented in Figure 4 and consists of three different entities: contractors, clients and tenders.

Firstly, clients and tenders are connected by the fact that their procurement choices heavily affect the form of government and the direction of the tender. This indicates the level of competition or cooperation (in case of CDT projects: collaboration) in client-contractor relationships. Secondly, contractors operate as systems integrators in a loosely coupled system and are responsible for the correct integration of client wishes and requirements in their tenders. On one hand, contractors and tenders are connected by type-3b couplings which are in this case called: inter-tender couplings across sequential tenders within construction firms. The tightness of these couplings indicates the amount of resources (knowledge, personnel, contacts and equipment) that is re-used or developed during and between tenders. In addition, single-loop learning concentrates merely on the methods and techniques that are used during tender procedures in order to provide feedback for future tenders. On the other hand, contractors are connected with clients by type-1b couplings which are in this case called: inter-tender couplings related to clients. Intra-tender couplings are irrelevant since communication between contractors and clients during tendering procedures is often prohibited. Since the inter-tender couplings related to clients differs from the inter-project couplings related to clients, the tightness is defined differently in this research. The strength of inter-tender client-contractor relationships, the amount of exchanged knowledge and used contacts indicates the tightness of the type-1b coupling. Moreover, double-loop learning focuses on the underlying thoughts of clients in order to determine whether the company's own values and beliefs are in line with market wishes (clients). Both single-loop and double-loop learning can be approached by the sender/receiver concept or the social learning concept. The sender/receiver concept utilizes communication channels to share knowledge and to increase the learning ability of the organisation. The social learning approach intends to encourage learning by social interaction between different tender teams.

3. Methodology

This research follows a qualitative approach to investigate a Dutch contractor's approach to the challenge of learning between CDT tenders from different learning perspectives. The process of the study is divided into four different steps where various research methods are utilized. The research process is presented in Figure 5. The document study includes bid invitations, CDT tender strategies, CDT tender plans, internal evaluations and external evaluations. The interviews create insight into the learning processes of the organisation. Subsequently, the main findings of both parts are combined in an expert panel in order to validate the results.

The research is entirely conducted at Dura Vermeer (DV) which is considered as the case in this study. DV is a large contractor in the Netherlands and specialised in building and infrastructural projects. The infra division of the contractor has four different regions and each region participates in several CDT tenders and projects. This research is performed at the northeastern region of the contractor since this region shows the largest amount of CDT projects.

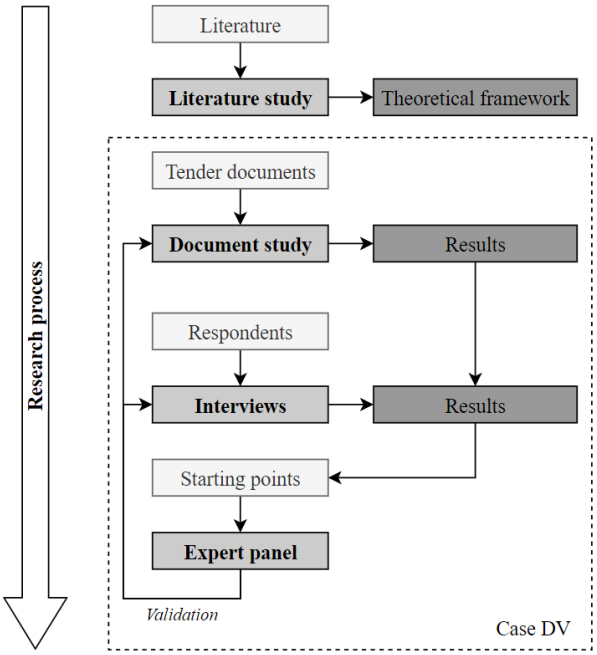

Figure 5 Research process

To explore the context of the research, an extensive literature review is performed. Although many studies focused on project learning, learning between tenders remains underexposed. A literature review is therefore used to create insight in the context of the construction industry, the shift towards collaborative contracting and especially CDT contracts, learning and the couplings within construction organizations and learning perspectives. Multiple tender documents are analysed in order to acquire more insight into the content of bid invitations, tenders and evaluations. Six different tender ranges with sequential tenders of various clients of the contractor are investigated in this phase and presented in Table 1. These ranges contain tenders for different projects such as road maintenance, road construction, bridge replacement and other civil structures. Moreover, the ranges include tenders of municipalities, provinces and water authorities from multiple regions. Additionally, the actual process of two CDT tenders is followed and observed closely to obtain a clear picture of the dynamic tendering processes at DV.

The third set of qualitative data is obtained by semi-structured internal interviews. Several persons from different positions that were involved in one or more CDT tenders from the investigated tender ranges were selected for this step. This selection of interviewees is presented in Table 2. Several questions were established in advance to guide the interviews but allow room for broad conversations. Each interview was divided in two sections. The first section contains questions to create more insight in the current tender processes of CDT tenders at DV. The second section of each interview was used to investigate the current approach towards learning in CDT tenders at DV. All interviews are recorded and transcribed directly after the session. The interview analysis starts with the process of 'open coding' of the transcripts trough labelling specific text passages. The next step is the 'axial coding' where all codes are compared and categorized. Subsequently, all codes within the different categories are connected and elaborated into conclusions during the process of 'selective coding' (Boeije, 2010). For the process of coding, the program Atlas.ti was used.

Table 1 Investigated tender ranges

Range	Client	Project
Tender range 1		
Tender 1.1	Municipality A	Road maintenance
Tender 1.2	Municipality A	Road maintenance
Tender 1.3	Municipality A	Road reconstruction
Tender range 2		
Tender 2.1	Municipality B	Centre renovation
Tender 2.2	Province A	City stream
Tender 2.3	Municipality C	Road construction
Tender 2.4	Municipality D	Road construction
Tender range 3		
Tender 3.1	Water Authority A	Replacement of valves
Tender 3.2	Water Authority A	Construction of barrages
Tender 3.3	Water Authority B	Construction of pumping station
Tender 3.4	Water Authority C	Bridge replacement
Tender range 4		
Tender 4.1	Municipality E	Bridge renovation
Tender 4.2	Municipality E	Sluice construction
Tender 4.3	Municipality E	Quay construction
Tender range 5		
Tender 5.1	Province B	Road construction
Tender 5.2	Province B	Road construction
Tender 5.3	Province B	Road reconstruction
Tender range 6		
Tender 6.1	Municipality A	Bridge replacement
Tender 6.2	Municipality F	Centre renovation
Tender 6.3	Municipality G	Road reconstruction

The results and conclusions from both the document analysis and the interviews are used as starting points for an expert panel. This exert panel was used to validate and discuss the main results of the research. In order to structure the process of the expert panel, three major findings were used as discussion points. In total, seven persons from different positions in the organisation participated during the expert panel of over two hours.

Table 2 Selection of interviewees

Function of respondent	Number
Regional Director / Head of acquisition	2
Tender manager	7
Project manager	6
MEAT-author	2
Estimator	2
Project engineer	2
Total	21

4. Results

Based on the theoretical framework, the results in this section are divided in two parts. The first part describes the findings regarding the inter-tender couplings across sequential tenders within the organisation of DV. The second part presents the findings regarding the inter-tender couplings related to clients. The main findings are summarized finally.

4.1 Inter-tender couplings across sequential tenders within the organisation

Within the organisation of DV there is a uniform process for the tenders of both integrated contracts and CDT contracts. Although

this process is identical for each contract, the implementation of the intermediate steps of the tender process are different for both contracts. In addition, the company's management system only distinguishes between traditional and integrated contracts. This system serves as guideline for all processes in each construction phase. Currently, the system does not include a separate process scheme for CDT contracts. Due to the absence of a clear structure, nearly all tender managers use their own implementation of the intermediate steps in the tender process of CDT contracts. For example, different tools are used to establish tender strategies. One tender manager declared that he uses a SWOT-analysis to determine an appropriate strategy. Another tender manager stated that he sometimes uses role-playing games to decide which parts are important and relevant. Moreover, a MEAT-author stated that she discussed about a uniform format for the start of the tender but over time, each MEAT-author uses his or her own interpretation.

In addition, different structures and formats are used to guide internal and external evaluations. The document study shows different formats for internal evaluations and not all evaluations are complete or available. The respondents from the interviews are saying the same things. While one tender manager uses his own word-document with questions for an evaluation, the other tender manager uses the prescribed evaluation format with fixed questions. The same applies for the documentation and storage of evaluations. The Word-documents are usually stored in the digital folder of a certain tender while the prescribed evaluations are automatically saved at another platform. The absence of internal evaluations is also confirmed by multiple respondents who stated that there is a stronger focus on external evaluations than on internal evaluations. Time constraints and unknown relevance are the main reasons for the inconsistent execution of internal evaluations. More than half of the project managers and tender managers stated that they particularly evaluate when they feel something can be learned. A MEAT-author and virtually every tender manager mentioned the overlap of different sequential tenders as the reason for skipping internal evaluations. Besides this, the document study and the observations show a strong focus on improvement areas in evaluation documents and during evaluations. The team members concentrate on the tender process, which problems occurred and what went well. These evaluations are primarily aimed at the process of tendering.

The team composition is generally based on additional value in the first place and availability in the second place. Team members are selected based on client knowledge, CDT tender and project experiences and specialised knowledge. Besides, all project managers and tender managers stated that they are selected based on their earlier work for the same client. However, the document study shows different team compositions for CDT tenders of the same client. This is mainly because of a lack of continuity and unavailability of personnel during tenders. By using different team compositions for different tenders, a few respondents stated that they can learn from each other. On the other hand, the majority of the respondents indicated that they are frequently 'reinventing the wheel' since they are constantly involved in new tender teams. In a new team, team members first get to know each other and due to the short lead time of CDT tenders, there is less time to get to know the project. The deployment of certain team members determines the input of specific knowledge in CDT tenders. During the CDT tender observations, the team members use examples, information and experiences from other CDT projects and tenders where they were involved. Team members are selected based on suitability for the project and the client and heavily rely on their own experiences in CDT projects and tenders. This means that their lessons learned are primarily contributed in CDT tenders where these team members themselves are involved.

Nearly all tender documents are centrally stored in one digital database. This database distinguishes between projects and tenders and each region has its own digital folder. In addition, CDT tenders also have a separate folder for important documents including final plans and evaluations. Although this folder exists, it is not updated regularly and it is incomplete. As mentioned before, evaluation documents are partially stored at the central database and partially at another program. Besides this, tender managers use regular and overarching meetings to exchange their tender experiences. These meetings focus on all types of tenders and not specifically on CDT tenders. MEAT-authors have their own meetings, a knowledge platform and a WhatsApp-group to share knowledge and to ask important questions. Nevertheless, many respondents stated that they rely on their own network of experts to acquire specific knowledge. The number of useful contacts in their networks depends on the familiarity with the company. All long-standing respondents stated that they have a great network and use their company contacts for specific CDT knowledge. Conversely, all short-standing respondents found it difficult to contact the right persons within the company for crucial input. Almost every type of knowledge is acquired in a reactive way during CDT tenders.

4.2 Inter-tender couplings related to clients

The infrastructural division of the organisation is divided into four different regions. Each different region has several focus areas and each area has its own manager. This organisational structure is aimed at client contact and client-contractor relationships. All respondents stressed the crucial necessity of client knowledge to uncover underlying thoughts and client intentions. Despite this structure and the acknowledgement of the importance of client knowledge, this type of knowledge is merely acquired reactively after the bid invitation and during tender procedures. Several tender managers stated that they intensively search for client knowledge during the tender procedure by contacting different connections of the client. In addition, project managers or project engineers are selected for a CDT tender based on their earlier experience with a specific client. Even though these experiences assist tender teams in creating a picture of the client, the picture of the client is only determined by the few persons involved with client knowledge. Besides this, several tender managers underline the fact that a few employees of the client's organisation are not representative for the whole client's organisation and highlight the importance of connections between the client and the contractor at different organisational layers.

External evaluations are done more consistently than internal evaluations. External evaluations are considered as highly important by all respondents since these evaluations provide crucial knowledge about the effect of the tender. A manager stated that external evaluations are one of the most important steps during tender procedures since the contractor can check whether his expectations are in line with the intentions of the client. However, these evaluations are primarily intended as feedback for the tender team and are not documented consistently. The document study also show different structures for external evaluations and several evaluations are incomplete or unavailable.

4.3 Concluding results

The organisation applies a uniform tender process for different contracts. However, the intermediate steps are implemented and executed differently by each tender manager. Many tender managers have a different approach for CDT tenders. Knowledge from other CDT projects or past CDT tenders is acquired reactively and usually during tenders. On one hand, explicit knowledge is predominately shared and acquired through digital databases. On the other hand, implicit knowledge is only partly shared through

general and overarching tender meetings and the involved team members determine which implicit knowledge or experiences are contributed. Besides this, internal evaluations primarily focus on the tender process and are not always done consistently due to time constraints and unknown relevance.

Although the organisational structure is aimed at client contact to enhance the client-contractor relationship between tenders, clients are merely approached indirectly and client knowledge is generally acquired reactively during tenders. The accuracy of this knowledge heavily depends on the persons involved and their contributed client experiences. Moreover, active acquisition of client knowledge is considered as important but not all external evaluations are done and documented consistently. In addition, past evaluations are used partially in current tenders due to the strong focus on separate CDT tenders and the unstructured way of documentation of external evaluations.

5. Discussion

This section discusses the existing couplings between the different entities in CDT tenders. It also indicates the level of learning by distinguishing between single-loop and double-loop learning. In addition, it describes whether the organisation follows a sender/ receiver approach or a social learning approach.

5.1 Organisational approach towards learning between CDT tenders

It seems that the couplings defined by Dubois and Gadde (2002) and the additional couplings established by Dorée and Holmen (2004) are also partly applicable for tenders. Type-1a and type 4 couplings are irrelevant since CDT tenders are barely executed by a combination of contractors. Besides this, type-2a and type-2b do not often occur since suppliers are not always involved during the tender procedures of the investigated CDT tenders. Yet, this research demonstrates the solid presence of type-1b and type-3b couplings between the contractor and sequential tenders and the contractor and clients. As described by Dorée and Holmen (2004) and presented in the theoretical background, the tightness of type-3b couplings is indicated by the amount of resources (knowledge, personnel, contacts and equipment) that is re-used or developed during and between tenders. Although the investigated contractor is aware of the potential of learning and strives for continuity of personnel during tenders, there is still a strong focus on separate tenders and team compositions differ for tenders of the same client. The contributed knowledge during CDT tenders heavily depends on the experiences and lessons learned of the involved persons. Past internal evaluations are conducted inconsistently and are partially used in current tenders. These evaluations are mainly backward looking and have little focus on future CDT tenders. In addition, tender 'equipment' such as strategy methods or evaluation tools, are used differently across the organisation. This means that despite the recognition of the learning importance by the contractor, the couplings between sequential tenders remain loose.

The shift from competition towards cooperation requires social control by the client and a strong focus on cooperation-based client-contractor relationships (Eriksson, 2008). Dorée and Holmen (2004) also stressed the importance of type-1b couplings. This shift towards collaborative contracting and the relational focus of clients in CDT tenders is also identified by the contractor. Their organisational structure is aimed at client contact and client knowledge is designated as the most important input during CDT tenders. Nevertheless, the acquisition of client knowledge is considered as reactive and depends on a few persons. Team members use their direct or indirect client contacts predominantly during tenders. This reactive way of knowledge acquisition and the strong focus on separate tenders also indicates the loose inter-tender couplings related to clients. The couplings related to clients are particularly important in an industry with a great variation of clients. Even though clients apply collaborative contracting, some clients focus on competition-based coopetition while other focus on cooperation-based coopetition. It seems that various clients opt for different levels of collaboration. If clients are unable to explicitly express their goals and intentions in bid invitations, type-1b couplings are essential to reveal underlying thoughts.

In terms of single-loop and double-loop learning (Argyris & Schon, 1978), this research shows clear signs of single-loop learning. External evaluations and sometimes internal evaluations are considered as important to learn from mistakes. These evaluations focus primarily on the process of tendering and the effect of the plan. Strategies and techniques are only adjusted after evaluations in order to increase the efficiency during CDT tenders. The contractor seems not fully aware of the evolved skills and more important, the gap between desired skills and evolved skills. The adjustment of values and beliefs remains underexposed and double-loop learning is still insufficient.

As widely acknowledged, the construction industry has a strong focus on single projects (Dubois & Gadde, 2002) and this is still recognizable in the organisation. Information is usually acquired in a reactive way and merely during the process of tendering. The organisation uses various databases to digitally share tender documents including bid invitations, tender plans, assessments and evaluations. Within this database there is a specific folder for CDT tenders. Tender teams and team member of current CDT tenders are thereafter responsible to acquire this information themselves. This particular concept of knowledge sharing within the organisation is strongly based on the sender/receiver concept. Hartmann and Dorée (2015) also showed that this concept has several limitations in the construction industry. These researchers already proposed a social learning approach to stimulate project learning. This approach is only partially used in the organisation during internal evaluations and overarching tender meetings between tender managers. Besides this, team members indicate that they learn the most from each other and their own contacts across the company. Although this concept is considered a highly efficient by both scientific literature and the organisation, the investigated contractor still applies a sender/receiver approach in order stimulate learning and knowledge sharing.

Despite the findings that the contractor aims at learning between CDT tenders, the couplings between sequential tenders and their clients are still loose. Tenders are mostly perceived as 'islands' and knowledge is acquired primarily in a reactive way. Besides this, the contractor has a strong focus on learning from mistakes (single-loop learning) by adjusting its strategies and methods instead of adjusting its values and beliefs (double-loop learning) in order to stimulate self-awareness. The focus on separate CDT tenders is supported by the sender/receiver approach where past tenders are perceived as senders and current tenders are perceived as receivers.

5.2 Practical implications

This research has two main practical implications to encourage learning between collaborative tenders in a competitive industry. Since this research investigated a contractor's approach, the main implications are predominantly applicable for contractors in the construction industry.

First, contractors should increase the tightness of inter-tender couplings across sequential tenders by moving form a sender/ receiver approach towards a social learning approach and by focusing on double-loop learning. The social learning approach is

particularly important during CDT tenders where a large amount of implicit knowledge is required. CDT tenders also have great focus on soft-skills and double-loop learning will therefore assist organisations to abandon their focus on separate tenders and to become self-aware of their skills and their skills development.

Second, the inter-tender couplings related to clients should be tightened by focussing on long-term client relationships. In this way contractors can actively acquire appropriate client knowledge between CDT tenders and become aware of the gap between their evolved skills and desired skills. These relationships should be established at different organisational layers to ensure accurate client knowledge and to create a representative picture of the client.

5.3 Limitations and further research

Although this research is concentrated on the infrastructural division of the organisation as a whole and other regions are investigated as well, the majority of the data is acquired in the northeastern region. This is because the researcher was located in this region and participated in two CDT tender processes for regional clients. In addition, this research relies for a large part on the experiences of respondents. Several additional observations during CDT tenders could create more insight in the process and the couplings between sequential tenders.

This research investigated a Dutch contractor's approach towards learning between CDT tenders by concentrating on the couplings between the different entities in the Dutch construction industry. Further research should reveal whether these couplings exist for learning between other types of tenders. Besides this, further research could also focus on different learning perspective to shed a different light on contractors' learning approaches.

6. Conclusions

Findings show the loose couplings between sequential tenders and between clients despite the contractor's aim to focus on learning in CDT tenders. The solid focus on separate tenders and the application of a sender/receiver approach obstructs the shift towards double-loop learning. By increasing the focus on double-loop learning, contractors are capable to become aware of their skills, the gap between evolved skills and desired skills and their skills development. What applies for project learning in general, applies for learning between tender in particular since tenders can be perceived as small projects. As the number of tenders exceeds the number of projects in organisations and tenders take place in a highly competitive environment, fast learning and steep learning curves creates advantages towards competitors. Self-awareness and a considerable level of learning provides an edge in the competitive and project-based construction industry. Contractors are then flexible and can easily move with the shift towards collaborative contracting and the constantly changing market demands.

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