

Towards effective exchange of information in the open and restricted tender procedures in the Dutch construction sector

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Abstract

Purpose – Research shows that the exchange of information in tenders is ineffective. It is (digitally) question-answer based and the way of communicating is juridical cramped, stiff and reluctant. Scopes remain unclear with unsuitable submissions as a result. The aim of this research is to improve the exchange between the contracting authority and the bidders during tenders by making exchange more effective by shifting from undesirable behaviour to desired behaviour. This will be done by providing insights into the current way of exchanging information, by showing how to come to effective exchange and by providing substantiated ways to implement effective exchange in the current way of working.

Design/methodology/approach – This research presents recommendations for the improvement of exchanges during tenders. The recommendations are based on a combination of theory-oriented and practice-oriented research. For the practice-oriented research interviews are taken and case studies are done.

Findings – The results show ineffective exchange forms a problem. This ineffective exchange has its origin in the adversarial culture in the construction sector. Research indicates that the exchange of information takes place through a communication process. For this process the way a message is formed, sent, interpreted and used is important. During this process, several filters and barriers will form a brake on the exchange. The contracting authority should include in the message what the problem is to what a tender will provide solutions, what his needs are and what he intent to get. He should use all possible communication channels during a tender to clarify the tender and he should use other tools as the information carousel, the intention, the concretization phase and the Marktvisie to improve the shared understandings. By taking an open, flexible and collaborative attitude the relationship with the bidders becomes more collaborative than adversarial. In this way uncertainties and equivocality can be reduced and submissions will be more suitable to the tender.

Value – The conclusion of this research will improve the understanding of effective exchange of shared understandings and meaningful information during tenders. It gives possibilities to shift from undesirable to desired behaviour and will result in a more effective exchange during a tender.

1. Introduction

Each year public contracting authorities have many projects that need to be realized. For the realization of those projects the public contracting authorities should tender the contracts. However, the construction projects become more complex, uncertain and dynamically. This means the contracting authority and the bidders should work closely together to understand the scope of a tender. They will do this by effective exchange, meaning shared understandings and meaningful information. Those understandings and information are a necessity for fulfilling the contracting authorities' needs in the submitted bid. However, the exchange is nowadays ineffective, meaning adversarial and opposed relationships in the construction sector and not open and helpful. Information exchange is cramped and marginal and the contracting authorities' focus is not on bidders' uncertainties or bidders' needs, but on his own needs. This is embedded in the construction industries' culture and exists already for many years. It is important to overcome the ineffective exchange. This research provides recommendations to do this, based on the results of twelve interviews and three cases.

2. Problem

Before the projects of contracting authorities can be realised, the contracting authority has to search for a suitable bidder that may realize the project. This search takes place via a tender process. The suitable bidder will be selected from many bidders, which submit their bids. To do a suitable bid, the bidders need information on the project. The information is exchanged between the contracting authority and the bidders. However, this exchange of information is problematic and ineffective, since the culture and attitude in the construction industry is adversarial. The problematic and ineffective exchange is expressed via some symptoms:

- Information exchange is question-answer based (Chao-Duivis, 2008; Assen, 2017).
- Information exchange is limited due to a fear of claims and procedures (Engström, Sardén, & Stehn, 2009; Assen, 2017; Deketh, 2017).
- Information exchange is cramped, expressed in a marginal, minimal and legally forced interaction and information (Kamminga & Smits, 2012; Timmerman, 2017).

That the exchange of information between contracting authorities and bidders is ineffective and abovementioned points are symptoms of ineffective exchange, is also recognized by a research of the knowledge institute CROW. In this research the CROW analysed the 'major grievances' of the construction sector by taking interviews with many contracting authorities and many bidders. Some of those grievances are mentioned in Table 1.

Table 1: Abstract of results of the National Survey of major grievances in the construction sector. Source: (CROW, 2017).

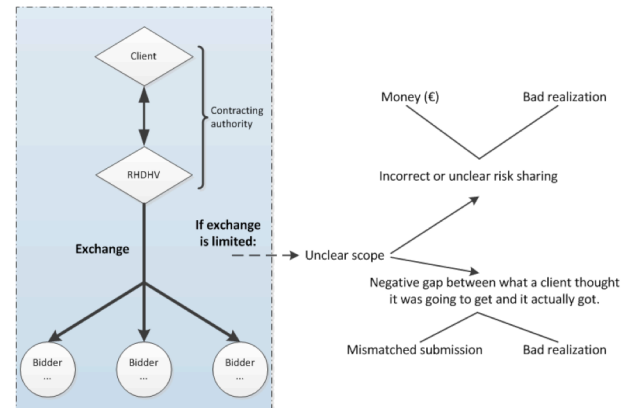
	(Strongly) disagree	Neutral	(Strongly) agree	Total
Contracting authorities do not treat us as equivalent.	18,35%	24,77%	56,88%	109
Contracting authorities place their own interest above the common interest.	13,76%	17,43%	68,81%	109
Contracting authorities are defensive in stand of cooperative.	10,09%	20,18%	69,72%	109

Contracting authorities are focussing on the contract, not on attitude/behaviour.	13,89%	16,67%	69,44%	109
Contracting authorities are willing to help.	29,41%	48,04%	22,55%	109
Contracting authorities focus on the bidders' needs, not only their own.	68,62%	24,51%	6,86%	109
Contracting authorities place the common interests above their own.	73,53%	21,57%	4,9%	109

The CROW research states the contracting authorities are mostly focussed on their own needs and not on the bidders' needs, they behave defensively, they do not focus on attitude or behaviour and they are not helpful. These points underpin the symptoms of ineffective exchange. They show the bidders are feeling the consequences of ineffective exchange. The contracting authority feels it indirectly. However, what are the consequences of an ineffective exchange? Figure 1 shows these.

Ineffective exchange causes uncertainty to bidders on the goal of the tender, the scope of the tender and the contracting authorities' needs. The contracting authority should mention these in the tender documents, but according to Laryea (2011) the tender documents are frequently of low quality or incomplete. Bidders base their submissions on the provided information (Daft, Lengel, & Trevino, 1987). Tender documents of low quality increase equivocality and differences in interpretation (Kamminga & Smits, 2012; Engström, Sardén, & Stehn, 2009), since for the bidders it is unclear what the scope is or what the contracting authorities' needs are (Hoezen, Reymen, & Dewulf, 2006). The contracting authorities should mention their needs. The unclear scope causes uncertainties and risks (Engström, Sardén, & Stehn, 2009; Laryea, 2011). Bidding costs increase since bidders will increase their margins to leverage their risks. Submissions will be unsuitable since the scope is unclear (Laryea, 2011). Submissions are unsuitable to what the contracting authority wants and discussions in the realization arise (Eriksson, 2011; Mitkus & Mitkus, 2014).

Figure 1: Consequences of an ineffective exchange of information.



So, as explained above exchange of information between contracting authorities and bidders during a tender is very important. However, ineffective exchange during tenders forms a broadly recognized problem. It led to unsuitable submissions, discussions in the realization and bidder uncertainties. To overcome these, the ineffective exchange should be tackled.

3. Background

The problem showed exchange is ineffective and problematic. Information is exchanged limited, cramped or marginal because of a fear of claims and procedures. Behaviour is adversarial rather than cooperative. This problem, the ineffective exchange and the expression of the symptoms of ineffective exchange, is not new. The origin of ineffective exchange lies many years ago.

Rethinking construction

In history, several circumstances have led to ineffective exchange. On the turn of the century the construction sector was facing heavy problems. First the tendered contracts were awarded on lowest price. As a result, low quality, small margins for the bidders and contracting authorities were unsatisfied with the results. Secondly a large building fraud was discovered in the Netherlands. Projects were over time, over budget and they were of low quality. According to Egan (1998) the construction industry should reconsider its processes. In his report 'Rethinking construction' Egan suggested to tender based on best quality instead of lowest price and to integrate different processes in the construction. Though, the Dutch government strengthened competition by means of 'competition is good, more competition is better' (Dorée, Holmen, & Caerteling, 2003). This meant an increased price-based focus combined with strangulated contracts, resulting in a strategic and calculated way of working. A consequence of this is an increase of adversarial relationships and a decrease of trust (Eriksson, 2008; Black, Akintoye, & Fitzgerald, 2000). The economic crisis in 2008 further sharpened the relationships (Rijkswaterstaat, 2016). While a gap was growing between the contracting authority and the bidders, the tenders became more complex, uncertain and dynamically and asked for a collaborative attitude of both contracting authority and bidders and asked for effective exchange of information.

Changes in Tender Law

Some possibilities to improve the exchange and to reduce the gap between the contracting authorities and the bidders arose by creating new tender legislation. Different European Directives on tendering in 2004 and 2014, implemented in the Dutch Tender Law, brought these possibilities (European Parliament and Council, 2004 and 2014). Behind the current way of communication via the tender documents and the information notices, some other ways were possible. Some new procedures were added, to dialogue or to negotiate (EIB, 2013). Tendering based on quality rather than based on price only became possible. However, the new procedures cannot be used in all situations. Also the culture in the construction sector still remained more adversarial in stand of collaborative.

The question rises if, despite changes in Tender Law and the tender procedures, these are felt as too restrictive to exchange information effectively. To solve this question, it is important to look at the Tender Law and the tender process to show if there are limitations.

3.1 Tender Law

First the most important elements in Tender Law are formed by the principles of tendering. These principles form boundary conditions to the possibilities of exchanging information during tenders. Second, tenders are run by following the tender process. Both the principles of tendering and the tender process will be checked if these form limitations to effectively exchange information.

Principles of tendering

The European Directive 2014/EC/24 prescribes principles applicable on tenders of public authorities. In the first consideration of this Directive, the European Commission states 'freedom' is the most important element of the Treaty on the Functioning of the European Union (European Parliament and Council, 2014). Distracted from 'freedom' are the following principles:

- *Principle of competition*: an open, fair and real competition is necessary.
- *Principle of equality*: equal treatment for all bidders. Contracting authority should actively guarantee this.
- *Principle of non-discrimination*: discrimination on nationality is forbidden. Equal chances.
- *Principle of proportionality*: criteria and requirements should be linked to and proportional to the extent and nature of a tender.
- *Principle of transparency*: all contracting authorities' actions and decisions should be motivated, since these can be discussed and checked.

Beside the principles, there are two more aspects of importance for tendering:

- *Early contractor involvement*: before the tender procedure starts, contractors can be involved to think about possible solutions, ideas or specifications. If used, the contracting authority should guarantee an equal playing field at the start of the tender procedure.
- It is not substantially possible to change the contract.

Based on the abovementioned principles of tendering it looks like these principles form no limitations on the exchange. These principles only mention competition should be guaranteed, every bidder should be treated equally and decisions should be motivated. The principles form no limitation on exchanging information. They only show if exchange takes place with one bidder, the other bidders should be treated equally. Additionally, the early contractor involvement shows exchange is possible before the tender starts as long as the principles are kept in mind. This is rather a possibility to exchange than a limitation.

Tender process

Possibly the tender process or an element of the tender process forms a limitation on the exchange. So, we focus on the tender process. This tender process is the journey a contracting authority makes to set up his needs, to set up the tender and to select the bidder that may realize the project. This journey, the tender process, can be split up in three phases:

- Strategy and preparation
- Running the tender
- Execution

In the first phase, the strategy and preparation phase, the contracting authority specifies the problem and the purchasing needs. Based on these needs and additional requirements and criteria, the specification is drafted. Selection and award criteria are composed, suitable to the extent and nature of the specification. In this phase the contracting authority may make use of input from the market via for example the early involvement of contractors. Finally the tender procedure will be chosen in this first phase. The contracting authority can choose a standard procedure (open or restricted procedure) or an additional procedure. Since the additional procedures have more possibilities to exchange than the standard procedures, it seems important to have a look at the standard procedures and research and/or optimize the exchange in these procedures. Automatically the exchange in the additional procedures will be optimized.

When the first phase is finished, the second phase will start: running the tender. In this phase the contracting authority will go through the tender procedure. He will do this step by step, using the following steps:

- *Announcement*: the contracting authority announces a tender will start. The tender will at least be announced (digitally) in writing.
- *Application*: candidates have to apply for participation in the tender (only in the restricted procedure). In this phase exchange can take place (digitally) written as well as oral. This exchange is used to clarify the scope and criteria.
- *Selection*: reduce the amount of applications in the selection phase, only in the restricted procedure. Exchange is (digitally) written.
- *Submissions*: submission of the bids by the bidders. Exchange in this phase is (digitally) written or oral. Exchange is used for clarifying scope and criteria.
- *Awarding*: the contract will be awarded. Exchange is (digitally) written and used to publish which bid wins the tender.
- *Contract close*: the contract is closed. Exchange is (digitally) written or oral.

After contract close, the execution phase (phase 3) will start.

As the different steps of the tender procedure showed, in all steps exchange is possible. This exchange can take place (digitally) in writing as well as oral, as is described in the ARW2016 (Dutch Procurement Regulations for Works). It means also in the tender procedure there are no limitations on exchanging information, except the way information is exchanged. The essential elements of the tender procedure (tender documents and submissions), for example, should be (digitally) in writing. All other exchanges can take place by oral communication as long as this communication is documented (Staatscourant, 2016).

Communication channels

The exchange can take place (digitally) in writing as well as oral. However, this exchange is possible via different communication channels. According to the Dutch Tender Law the following communication channels are possible during a tender procedure:

- *Market consultation*: the market consultation can be used to gather market conditions, information for the tender or to test a tender.

- *Tender start-up meeting*: at the start of the tender procedure the contracting authority can explain the tender, the scope and what his needs are.
- *Questions for the information notices*: bidders can ask for clarifications on tender documents.
- *Bilateral information rounds*: face-to-face meeting with the contracting authority to clarify the scope, to test ideas or to ask questions with a commercial interest. The principles of tendering should be kept in mind!
- *Dialogues*: face-to-face meetings with the contracting authority to talk about the specifications, ideas or submissions (not for the open or restricted procedures).

So, during the tender procedure there are many different possibilities to use to exchange information between contracting authorities and bidders. The only limitation in exchange is that during the standard procedures only the market consultation, the tender start-up meeting, questions for information notices and bilateral information rounds may be used. Using the channel 'dialogues' is not allowed. It seems the tender procedure forms no limitations on exchanging information.

By analysing Tender Law and the tender process, there is checked if these form limitations on exchange and cause ineffective exchange. Both the Tender Law as the tender process have showed there are many ways to exchange information during tenders and exchange is allowed. Ineffective exchange does not depend on Tender Law or the tender process; it depends on the way contracting authorities and/or bidders work.

3.2 Working process of Royal HaskoningDHV

One of the Dutch companies facing the same symptoms and consequences on exchange as mentioned before, is the engineering and project management consultancy company Royal HaskoningDHV. Royal HaskoningDHV have recognized the problem of ineffective exchange between the contracting authority and the bidders during tenders. When they help the contracting authority by setting up a tender or running a tender, they recognize the exchange can be improved. They do not want to lean backwards, but they will improve this exchange of information. To this, Royal HaskoningDHV has assigned this research and they have created the possibility to do research on how exchange can become more effective.

To gain insights in how exchange takes place in the tenders Royal HaskoningDHV help the contracting authorities, it is necessary to know how they work. Together with Royal HaskoningDHV a list of roles is conducted on how the contracting authority reacts in three specific phases during the tender process. These phases and roles are given below. A further explanation of each role, what is intended by taking this role and the effect of this is elaborated in the *Appendix*.

The first phase is the preparation phase. In this phase the tender will be set up and information will be exchanged to the bidders. Below, some ways on how they act during this phase.

1. The contracting authority is actively looking for information from the market and bidders will give these information.
2. The contracting authority exchanges a lot of information without explicitly identifying the usefulness and/or necessity of it.
3. The contracting authority is reluctant and/or legally cramped to provide information.
4. The contracting authority reduces the risks of bidders by explaining which information is meaningful.
5. The contracting authority does not consider or too little the information needs of the bidders.

The second phase is about sharing understandings and how the attitude and behaviour is while providing information.

1. Bidders are actively looking for information and the contracting authority exchanges this information open, fairly and motivated.
2. Bidders are actively looking for information, but the contracting authority exchanges limited information.
3. Bidders propose alternatives and the contracting authority takes these in consideration.
4. Bidders propose alternatives and the contracting authority rejects without considering these.
5. The contracting authority determines what information the bidders need and exchanges information on this basis.

The third phase is about sharing understandings and what communication tools are used.

1. The contracting authority communicates (digitally) in writing only with the bidders.
2. The contracting authority communicates (digitally) in writing as well as oral with the bidders.

The roles involve elements of ineffective exchange. Some roles show the attitude is adversarial rather than cooperative, the contracting authorities' behaviour is cramped and reluctant to exchange information, the contracting authority is not willing to help bidders and only formal (digitally) in writing communication takes place because the contracting authority is anxious for procedures and claims. Besides, there are some roles focussed on a positive exchange. Abovementioned way of working shows the ineffective exchange is a result of the way of working.

To conclude

The background has showed the problem of ineffective exchange had not been arisen recently. In history several circumstances have contributed to the adversarial relationships between contracting authorities and bidders. These have led exchange become ineffective. Attempts to overcome the adversarial relationships and the ineffective exchange failed. These attempts consists of changing Tender Law by means of widening the possibilities to communicate, adding new tender procedures in what dialogues and negotiations were allowed and changing price-based awarding into price- and quality-based awarding. The relationships remain more or less adversarial and the exchange ineffective. Tender Law and the tender process are checked both. Tender Law only mentioned boundary conditions in what tendering and exchange should take place. It even shows exchange is possible to set up a tender. The tender process showed during all steps of the tender procedure exchange is possible. In some steps exchange may be (digitally) in writing only, in others (digitally) in writing as well as oral. Tender Law prescribes different communication channels via what exchange is possible during a tender procedure. So, Tender Law and the tender process form no limitations to exchange. After this, the working processes of a company were checked. Their way of working partly consists of roles, which show symptoms of ineffective exchange. This is in line with the culture in the construction sector that is described as opposed and adversarial. The ineffective exchange led to unsuitable submissions. Abovementioned shows despite changes are made to overcome the

adversarial relationships, exchanges remains ineffective and forms a real problem. Research should be done to make the ineffective exchange more effective.

4. Theory

Before research can be done, it is important to have some knowledge on how exchange takes place. For exchange communication is necessary. To gain the knowledge, in the first paragraph research is done to communication theory. In communication theory the communication process is treated. This process shows how communication takes place and what is important in communication and thus for exchanging information. The second paragraph shows why an improved exchange, meaning a more effective exchange, is necessary. The third paragraph shows how the effectiveness of exchange is measured and the fourth what the aim of research is.

4.1 Communication theory

The exchange of information between two or more parties takes places through the communication process. For this process the following items are important: the sender, the message, the receiver, the medium, the channels and the filters and barriers (Figure 2). The sender needs to explain or clarify something. So, he composes a message that should contain his needs. The receiver interprets the message based on his knowledge and based on the way the message is sent. The mediums through which the message is sent and the communication channels that are used to send the message, influence the way a message is interpreted. For tendering a specific, hard medium is applicable: the tender procedure. This medium prescribes what communication channels can be used, which were mentioned in 3.1. According to Wang & Dong (2014) and Mason (2007) the message should be composed clear and be sent effectively and interpreted well. The barriers and filters influence how the message is sent or interpreted, by aspects limiting the information exchange or by aspects that interfere with the exchange.

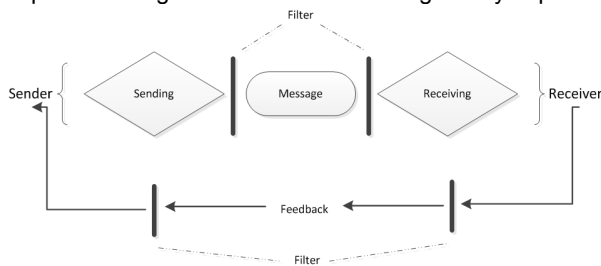


Figure 2: Communication process. Based on: Thomas, Tucker, & Kelly (1998) and Shannon (2001).

Aforementioned communication process is useful to gain an understanding on the exchange of information in the construction sector. The communication medium is formed by the tender procedure; the possible channels to communicate are especially prescribed for tendering and the principles of tendering in Tender Law form filters and barriers. Each of these forms boundaries to the exchange. Besides, attitude and behaviour form also filters and barriers as is earlier showed in the working process of Royal HaskoningDHV.

4.2 Effective exchange

The exchange is influenced by several filters and barriers, as is showed in the communication process. These filters and barriers ensure the exchange is ineffective, while ineffective exchange is a real problem. To overcome the effects of ineffective exchange, namely an unclear scope, equivocality and unsuitable submissions, the exchange of information during tenders should improve to become more effective. The definition of effective exchange for this research is based on Engström, Sardén, & Stehn (2009):

“Effective exchange consists of interaction and the timely transference of shared understandings and meaningful information to limit or prevent uncertainties and equivocality”. Shared understandings covers an equal interpretation of information, while meaningful information consists of all information necessary for a suitable submission.

With effective exchange the contracting authority can clarify what his needs are, while the bidders need interaction and information to create their submission suitable to the tender (Chao-Duivis, 2008). Meaningful information should be shared and contracting authorities as well as bidders should be open and transparent on what information is available and on what information is needed (Rijkswaterstaat, 2016). The exchange of sharing understandings and meaningful information should be improved to come to suitable submissions. This means by effective exchange the symptoms of ineffective exchange and the major grievances in the construction sector will be overcome.

4.3 Model

Research should be done to shift from ineffective exchange to a more effective exchange. Ineffective exchange and a more effective exchange are both difficult aspects to measure. For this reason ineffective exchange and effective exchange are operationalized by setting up and linking aspects to ineffective exchange (showing undesirable behaviour) and effective exchange (showing desired behaviour). The effectiveness of exchange is measured on the aspects described in Table 2. The ‘undesirable behaviour’ shows aspects of ineffective exchange, which are based on the problem, the symptoms of ineffective exchange, the major grievances in the construction sector, Tender Law, the working process of Royal HaskoningDHV and on communication theory. The ‘desired behaviour’ forms the counterpart of the undesirable behaviour. A more effective exchange means a shift from undesirable behaviour to desired behaviour.

Table 2: Research model. The model shows for all aspects the undesirable and the desired behaviour.

Aspect	Undesirable behaviour	Desired behaviour
A Collect information	The tender is based on own information	Information is collected to base a tender on market conditions and interests

B	Equality	Bidders are treated not as equivalent	Bidders are treated as equivalent
C	Help	Contracting authorities' are not willing to help bidders	Contracting authorities are willing to help bidders
D	Uncertainties	Unaware of bidders' uncertainties	Aware of bidders' uncertainties
E	Attitude & behaviour	Focus on the contract only, not on attitude and behaviour	Focus on the contract and focus on attitude and behaviour
F	Attitude & behaviour	The attitude is adversarial, reluctant, stiff and cramped	The attitude is open, flexible and cooperative
G	Scope	The scope is unclear and vague	The scope is clear and sharp
H	Information	Provide all information in a tender	Provide only meaningful and useful information in a tender
I	Exchange	Exchange is limited and cramped	Exchange is open and motivated
J	Needs	Contracting authorities' needs are unclear and vague	Contracting authorities' needs are clear
K	Needs	Own interests / needs above common interests / needs	Focus on common interests / needs
L	Needs	Unaware of bidders' needs	Aware of bidders' needs
M	Communication / interaction	Formal procedural	Meaningful conversation
N	Communication / interaction	Cramped, marginal and minimal	Rich
O	Tender documents	Low quality: vague, unclear and items are missing	High quality: clear and complete
P	Responsibility & claims	Cramped exchange to reduce responsibility and claims	Take responsibility and exchange open and transparent on available information
Q	Costs	High bidding costs due to high risk margins due to high risks	Lower bidding costs and low risk margins due to less risks

4.4 Aim of research

The aim of this research is to find ways to shift from 'undesirable behaviour' to 'desired behaviour'. In this way the exchange between the contracting authority and the bidders during tenders become more effective. This research provides insights into the current way of exchanging information, shows how to come to a more effective exchange and provides substantiated ways to implement effective exchange in the current way of working.

5. Methodology

Research is done to tackle the problem of ineffective exchange by providing ways to shift from undesirable behaviour to desired behaviour. For this research some assumptions were made. A research set up is created on how research is conducted, on how data is collected and on how this data is translated into recommendations.

Assumptions

For this research the following assumptions were made:

1. A public authority and eventually a consultancy firm form the contracting authority.
2. Research is limited to the exchange in tenders for public clients above the European threshold.
3. Research is only focussed on the tender process.
4. Research focuses on improving exchange to a more effective exchange.
5. Research is limited to improvement of the exchange in the standard tender procedures.

Research set-up

The problem description, the ineffective exchange, the major grievances and the roles in the working process showed how exchanges take place and what the problems with the current exchange are. Ways to shift from the undesirable behaviour to desired behaviour should be found to get a more effective exchange. These ways are based on theoretical and practice-oriented research.

The theoretical phase of the research is used to create the background of this research. It is used to get familiar with different aspects of the communication process, since this communication process is necessary to understand how information is being exchanged. However, exchange in tenders is subject to legislation. To this, research is done on the legal principles of tendering, the tendering process and possibilities to communicate during this tender process.

The practice-oriented phase of the research is done to gain an insight into how the exchange between the contracting authority and bidders is set up and how the exchange is experienced in practice. This research consists on the one hand of practical experiences from different contracting authorities and bidders. On the other hand case studies are used; consisting of three projects Royal HaskoningDHV were involved. The projects can be divided in a successful project (Marker Wadden), a poorly graded project (WKO Museum Boijmans van Beuningen) and an innovative tender project (project DOEN – Nijkerkerbrug).

The results are analysed, combined and replaced in the model (Table 2) with the undesirable behaviour and the desired behaviour. In this case, the research shows if in practice aspects of undesirable or desired behaviour are shown. The practical experiences also show more aspects of undesirable behaviour and it gives suggestions for ways to come to a more effective exchange by shifting to the desired behaviour. Lastly some points of consideration for the ways to shift from the undesirable behaviour to the desired behaviour are mentioned, to let the exchange become more effective.

After analysing, the results are discussed. Part of the discussion is giving the limitations of the results and the way this research is done. Based on the discussion a final conclusion is given and recommendations are done.

Data collection

For the data collection different sources are used. These sources are: literature studies, desk research and interviews.

To get familiar with the problems in the exchange of information during tenders, with the process of exchanging information, with tendering, with legislation on tendering and with communication in tenders, literature studies and an extended desk research are done. Academic literature as well as non-scientific research reports was used.

To obtain insights in how the construction sector thinks of exchanging information in tenders, how they experience this exchange and how the sector thinks the exchange can be improved, multiple interviews were conducted. These insights can show if the behaviour in tenders is as mentioned in the model (Table 2), if some other aspects of undesirable behaviour are experienced in practice and it can help to find ways to come from the undesirable behaviour to the desirable behaviour, meaning a more effective exchange. Those interviews were conducted with members of both the contracting authorities and the contractors (bidders) to show how both sides experience the current exchange and to show what should be changed in what way according to both sides. Six useful interviews were held with public contracting authorities on all governmental levels and six interviews with contractors of construction companies. The small companies seem contracting to tendering complex project above the European threshold, but those parties are specialized in specific works, which they do in small and large projects. For these interviews an interview protocol was used. The objective of these interviews was to gain an insight in the way the exchange of information during tenders is being performed in practice and to find suggestions to let exchange become more effective.

To obtain insights in how information is exchanged in some projects in more detail, case studies are done. For the case studies data was collected by analysing project documentation, project reports and occasionally an additional explanation from a project employee. The case studies are used to show how exchange is conducted during a specific project; to show how exchange is experienced, what behaviour is showed (undesirable or desired behaviour) and what led to those experiences. Possible ways leading to the desired behaviour, meaning effective exchange can be found in the case studies.

6. Results

The practice-oriented research consisted of interviews and case studies. This practice-oriented research was done to obtain insights in how the construction sector experiences the exchange of information in tenders and how the sector thinks the exchange can be improved. The case studies additionally showed how exchange is set up in projects and how this exchange is experienced. The results are combined and linked to the model in the analysis in the next chapter.

6.1 Interviews

Interviews were held with six contracting authorities (OG's) and contractors/bidders (ON's). The interviews focussed on how a tender is set up, how communication is organised, how it is valued and what should be changed to improve the exchange of information.

Organization of tenders

Contracting authorities start a tender in two ways. On the one hand it is a political project and on the other hand it comes from the business itself. They set their needs and specify the tender, sometimes assisted by a consultancy firm.

The bidders come in contact with tenders via a digital platform such as TenderNed or purchasing plans. The bidders have several go/no go evaluation moments during a tender.

To run the tender, communication and information exchange is necessary. The OG's and the ON's mention the European tender threshold influences the way in what communication takes place. Below threshold communication and information exchange is less bounded to rules. This means they sometimes call or email. Besides, the OG's and a small part of the ON's mention the tender procedure influences the way communication can take place. The other ON's say they can only communicate and exchange by asking questions for the information notices. In their opinion the tender procedure has no influence.

According to the contracting authority as well as the bidders the following communication channels are used during the tender procedure: market consultation, tender start-up meetings, questions for the information notices and bilateral information rounds.

Needs to exchange

Contracting authorities use communication channels to test how the market conditions are (OG 4/5) and to test and clarify their needs in a tender, so the bidders can submit suitable bids (OG 1/2/3/5/6). Bidders need communication and exchange to understand the conditions of a tender, what the scope is and what the contracting authorities' needs are (ON 1-6). The conclusion from the interviews: the current communication and exchange do not support understandings of scope, problem content and needs. The result: unsuitable submissions.

Space to exchange

During the tender there are several possibilities to communicate. According to the interviewees the communication channels for exchanging information, which are used during tenders are the following. The market consultation is sometimes used, but too less according to ON's and OG's. Tender start-up meetings are useful, but not often used by OG's and ON's. ON's can ask questions for the information notices that are always used. All questions in these information notices are answered (OG's/ON's), however the answers are most of the time bad motivated (ON's). A major part of the OG's (OG 1/2/3/6) recognize the questions are bad answered or motivated, but do not change their way of answering. Answering depends on the project manager and is influenced by fear of claims. Last communication channel is the bilateral information round, which is useful but used less since contracting authorities are anxious.

Evaluation on exchanging

Half of the OG's mention their needs are fulfilled. The other part of the OG's and the ON's mention their needs are not fulfilled, as comes forward in their experiences. OG 2 said the attitude and behaviour is 'they and us', resulting in bad motivated answers on questions. Submissions of the ON's are many times not suitable to the tender (OG 2/5/6). This directly shows the biggest problem of all ON's: tenders and scopes are vague with more uncertainties and risks as a result. To this, submissions are unsuitable to the tender.

Behaviour during exchange

The abovementioned problem is a result of the attitude and behaviour of OG's and ON's. Both the OG's as well as the ON's say effective exchange helps in improving the tender, reducing the uncertainties and improving submissions. According to the OG's and ON's the unsuitable tenders are a consequence of the adversarial, reluctant, stiff and anxious attitude and behaviour of OG's. Two of the OG's (OG 1/4) think they are open, transparent and cooperative. OG's mention that ON's are fishing for information, conservative, open, collaborative and that you should be aware what you say, because the ON's will use it against you.

Changes: reflection and initiatives

On the question what should be changed in the way communication takes place and information is exchanged, the contracting authorities and bidders responded varyingly. Some of the contracting authorities are satisfied with the current way they do it, one of them answers the communication depends on the project manager and the others believe communication should improve. They think the OG's attitude and behaviour should change: less anxious and reluctant, more helping the ON's and clarifying what they will get with the tender by having an open attitude (OG 4/6). The ON's (ON 1-6) are all unsatisfied with the current way of information exchange. They are incomprehensible about the vague tenders and scopes and they are unsatisfied with the OG's answers on questions. According to the ON's the following should change: clarify your needs (ON 2), answer all questions motivated (ON 2/6) and behave less anxious in exchanging information or communicating via other communication channels than digitally question-answer based communication (ON 1/4/6).

According to a part of the OG's and a part of the ON's initiatives such as the Marktvisie or Beter Aanbesteden can improve information exchange and communication in tenders. These initiatives are about improving the attitude and behaviour from 'they and us' into 'together' and about sharing information. Besides, they are on how the tender process can be improved. In the opinion of these OG's and ON's the initiatives form tools to make you aware on how to improve behaviour, attitude and tendering, they are not solutions. The other part of the OG's and ON's think these initiatives will not help or they do not know them.

Different perspective: looking at the tender through the counterparty's glasses

If the OG was an ON, what should he change? And otherwise: if the ON was an OG, what should he change? OG's think more time is needed for analysing all tender documents and creating submissions or only useful and necessary information should be provided to lower time pressure and costs in tenders. They even think OG's should guide ON's in their needs and what they will get. Last points of improvement is using pre-announcements to give ON's more time to create the best tender team and using other communication channels during the tender. ON's think OG's should know what the investments in tenders are in time and costs. They think OG's should lower the time pressure by only providing useful and necessary documents. Besides, distinctiveness should be improved by changing the focus in tenders from price to quality.

6.2 Case studies

Three different case studies are analysed. These are a successful project (Marker Wadden), a poorly graded project (WKO Museum Boijmans van Beuningen) and an innovative tender project (Project DOEN – Nijkerkerbrug). For each project a description of the project, the course of the tender and the effects of the chosen way of exchanging information are given. The results of the three case studies are given below.

Project 1. Marker Wadden

This project is a successful project. This project consists of the design, construction and maintenance of a group of islands in the Markermeer. The contracting authority used a market consultation to check the market conditions and to use market input in the tender documents for this group of islands. The tender consisted of two goals, which are interwoven in all tender documents. Different checks by an internal TenderBoard had sharpened these documents. During a tender start-up meeting the contracting authority clarified and explained the problem content, the scope and their needs. During the first phase the amount of bidders was reduced based on selection criteria. The second phase consisted of a competitive dialogue. During the bilateral dialogues all aspects of a tender were discussed.

During this tender the contracting authority led the tender from two ambitious goals, he clarified motivated when asked by bidders, his attitude was open and flexible, he dialogued in a real conversation with bidders and he intervened when something seems to go wrong.

Project 2. WKO Museum Boijmans van Beuningen

The second project is an example of a less well-organized tender. A heat-cold-storage has to be designed, constructed and financed for the next 20 years with the option for an additional 20 years for the Museum Boijmans van Beuningen in Rotterdam.

Based on selection criteria the amount of bidders was reduced. They had to submit a plan of action including the design, a plan of realisation and an exploitation plan.

During the tender the bidders had many questions on the project, contract and liability. The contract was complex and elements of the tender were not mentioned smart enough. However, the project manager thought that bidders should base their submissions on the provided information. The only communication channels used were the tender documents and questions for the information notices. The answers were not sufficient, despite inserting additional question rounds. The contracting authority decided to start a bilateral information round. The relationship between the contracting authority and the bidders was adversarial rather than collaborative. The final result was that there were only unsuitable or no submission done, resulting in a failed tender.

Project 3. Project DOEN – Nijkerkerbrug

This tender is an innovative tender. The tender consists of major maintenance of the Nijkerkerbrug. The tender started with a market consultation. During this market consultation the following issues were conducted:

- Who knows what, who will know it? The contracting authority and bidders have another information need.
- Collaboration from the start.
- Writing the contract together.
- Fair money for fair work done.

The tender consisted of different phases. In the first phase the amount of bidders was reduced by selection criteria and an assessment on collaboration. Then the dialogue phase started. During this phase, bidders could ask in the 'information carousel' for information they thought they needed to fulfil the contracting authorities' needs. This carousel consisted of several successive dialogues in what the bidders spoke with the contracting authority. After the dialogues there was a concretization phase with the preferred bidder. During this phase the plan of action was elaborated in detail together with the contracting authority, to see if there is a shared understanding of the project and the contracting authority's needs.

Most important points of this tender were 'the intention' and thinking in different information needs. The intention means the contracting authority should ask the question: 'Why do we do this in such a way?' Is the way in what we think we should do it, also the best way? The choices the contracting authority has made should be motivated.

The difference in information needs consists of the differences in the information the contracting authority supposes the bidders will need and the information the bidders actually need. Sometimes information is exchanged that is not necessary for the tender, while useful information for bidders is missing.

7. Analysis

In this analysis the results from the interviews and the results from the case studies are linked to the model in Table 3. By combining the results to the model, for each aspect is showed why and how this aspect comes to expression. The expression of undesirable behaviour gives insights in what should be changed to overcome this undesirable behaviour. The expression of desired behaviour shows possibilities to make exchange more effective.

Table 3: Results linked to the model.

Aspect	Undesirable behaviour	Desired behaviour	Because
A	Collect information	The tender is based on own information	Most of the interviewees said the tender is not based on market consultations. Their needs are not fulfilled (testing/clarifying needs based on market conditions).
		Information is collected to base a tender on market conditions and interests	Interviewees mentioned feeling the market conditions and testing/clarifying needs and scope is necessary for clear tender documents. Cases 1 and 3 showed this.
B	Equality	Bidders are treated not as equivalent	Interviewees showed behaviour is 'they and us' focussed, in what the contracting authority focused on his own needs and decided how to answer questions or to provide what information. Bidders are dependent on them and not seen as equivalent.
		Bidders are treated as equivalent	A shift should be made from 'they and us' to 'together', to come to better solutions. This cooperation means bidders are seen as equivalent. Case 1 showed the attitude and behaviour of the contracting authority was on how to come to the best tender and the best submissions together with the bidders. In case 3 the behaviour was open and collaborative and the tender process was on how to find the best submission by closely working together and by finding the bidder collaborating at best.
C	Help	Contracting authorities' are not willing to help bidders	Case 2 showed the contracting authority was not willing to help bidders. The bidders got the tender documents and should base their submissions on the provided information, while the bidders had many uncertainties.
		Contracting authorities are willing to help bidders	Interviewees mentioned the contracting authority should help bidders more in a tender and guide them on the provided information. Part of the Marktvisie is how to come to the best submissions together and being open on what information is available, who owns what information and on what the status of the information is.
D	Uncertainties	Unaware of bidders' uncertainties	Contracting authorities are aware of the different communication channels during a tender. These channels (market consultation, tender start-up meeting, information notices and bilateral information rounds) can help to reduce the bidders uncertainties. However, they are less used. Many uncertainties remain according to interviewees and case 2. Contracting authorities are not aware of the bidders' uncertainties or they are afraid to use different channels because they will reduce responsibility and the chance of claims. Questions are badly answered/motivated, while tender documents are insufficient.
		Aware of bidders' uncertainties	Interviews showed contracting authorities should clarify their needs to help bidders to reduce their uncertainties. They mentioned the different communication channels (market consultation, tender start-up meeting, information notices and bilateral information rounds) could help to reduce the bidders uncertainties. Case 3 showed the contracting authority was aware of the bidders uncertainties. To this, he worked cooperatively with the bidders and gave them the possibility to ask for information they thought they need via the information carousel, to overcome their uncertainties.
E	Attitude & behaviour	Focus on the contract only, not on attitude and behaviour	-
		Focus on the contract and focus on attitude and behaviour	The Marktvisie showed focus should not only be on the contract. Attitude and behaviour in a tender is important. The Marktvisie will help parties to shift the focus.
F	Attitude & behaviour	The attitude is adversarial, reluctant, stiff and cramped	The contracting authorities' attitude and behaviour is adversarial, reluctant, stiff and anxious. The adversarial attitude does not help in fulfilling the bidders' needs and the contracting authorities do not use all communication channels to clarify the tender (cramped, reluctant). Case 2 showed an adversarial relationship sharpens the relations and would not help to come to the best solutions.
		The attitude is open, flexible and cooperative	Two interviewees said they are open, flexible and cooperative. The other interviewees answered the attitude and behaviour should be more open, less anxious and less reluctant. A shift should be made

				from 'they and us' to 'together'. Making use of all communication channels can help. The Marktvisie helped parties in how to behave during a tender. Case 1 showed an open and flexible attitude could help to come to the best submissions. In case 3 the tender process was about collaboration and coming together to the best submission by working closely.
G	Scope	The scope is unclear and vague		Scopes are many times unclear for bidders. Case 2 showed insufficient tender documents led to an unclear scope, many questions and a failed tender.
			The scope is clear and sharp	Case 1 had tender documents of high quality. In those documents the ambiguous tender goals are interwoven in all documents. Documents are of this quality because an internal TenderBoard had checked the documents many times. Besides, this case used the tender start-up meeting to additionally explain the documents/needs. This cleared the scope. Case 3 used the information carousel in what bidders asked for all information they thought they need to create suitable submissions.
H	Information	Provide all information in a tender		Case 2 showed all tender documents and reports were shared without mentioning the necessity
			Provide only meaningful and useful information in a tender	Interviewees mentioned the contracting authority should only provide meaningful information in a tender. Case 3 used the 'intention'. The contracting authority asked the question why they share what information. Based on this, only useful information was shared. Besides, bidders got the option to ask for information they thought they need (information that is meaningful for them) in an information carousel.
I	Exchange	Exchange is limited and cramped		Interviewees mentioned the exchange is insufficient, partly showed by the limited use of different communication channels. Case 2 showed the tender documents were insufficient, bidders had many questions and a high need for information, while the contracting authority limited the exchange.
			Exchange is open and motivated	Using different communication channels can get an open and motivated exchange. Case 3 gave the possibility to ask for information in the information carousel and this information was exchanged openly. Part of the Marktvisie is how to come to the best submissions together and being open on what information is available, who owns what information and on what the status of the information is. Being aware of each other's needs is important.
J	Needs	Contracting authorities' needs are unclear and vague		Bidders need exchange and information to understand the conditions of a tender to come to suitable solutions. Needs are many times unclear for bidders.
			Contracting authorities' needs are clear	Interviews showed the contracting authority should clarify the needs. The high quality tender documents in case 1 with ambiguous goals, which are interwoven in all documents and are checked by an internal TenderBoard and the additional clarification in a tender start-up meeting resulted in clear needs. Case 3 used the information carousel in what bidders asked for all information they thought they need and with the concretization phase shared understandings are gotten
K	Needs	Own interests / needs above common interests / needs		Interviews and case 2 showed the contracting authorities' focus is on sharing the tender documents and getting what he wants. There is no or too less focus on the bidders' needs.
			Focus on common interests / needs	The contracting authority in case 3 used the information carousel to give bidders the possibility to ask for all information they thought they need. There is thought about the bidders' needs, to improve the shared needs (the submission). Also the concretization phase helped to come to shared understandings on the submission and realization. The Marktvisie is on focus on all needs.
L	Needs	Unaware of bidders' needs		Questions are badly answered and motivated. Case 2 showed bidders need clear information in a tender, while in this case the tender documents were not sufficient and led to uncertainties and many questions.
			Aware of bidders' needs	Bidders need clear tender documents, with clear needs and a clear scope. When the contracting authority clarifies his needs, he helps to fulfil the bidders' needs. Case 3 showed the contracting authority perceives there is a difference in information needs between them and the bidders and they react on this by using the information carousel.
M	Communication / interaction	Formal procedural		Interviewees and case 2 showed most of the time only basic communication is used: tender documents and information notices. Other communication channels are not used.
			Meaningful conversation	Case 1 used a tender start-up meeting to talk about and to clarify the tender documents and it used dialogues to have meaningful conversations about all items of the tender. Case 3 used the concretization phase to come to a shared understanding on the submission.
N	Communication / interaction	Cramped, marginal and minimal		Only tender documents and questions for the information notices are used, which are badly motivated. Exchange is minimal, while bidders have a high need for information (case 2).
			Rich	Interviewees asked for a rich interaction between the contracting authority and the bidders. Case 1 used a tender start-up meeting to talk about and to clarify the tender documents and used dialogues to talk about all items of the tender in a real conversation. Oral conversations are rich compared to (digitally) in writing. Case 3 used the information carousel in what bidders asked for all information they thought they need and with the concretization phase shared understandings are gotten. Also the concretization phase was used in what a meaningful conversation starts with the preferred bidder on how he will realize his submission and to check if there is a shared understanding. To this, communication is rich.
O	Tender documents	Low quality: vague, unclear and items are missing		Tender documents are many times insufficient and unclear, since scopes and needs are vague/unclear and bidders had many questions for clarifications (interviews / case 2).
			High quality: clear and complete	Case 1 showed tender documents can be of high quality. In those documents the ambiguous tender goals are interwoven in all documents. Documents are of this quality because an internal TenderBoard

				had checked the documents many times. Case 3 showed documents could become of high quality by giving the possibility to ask for all needed information (carrousel).
P	Responsibility & claims	Cramped exchange to reduce responsibility and claims		The contracting authorities' attitude is adversarial and questions are badly answered and motivated.
			Take responsibility and exchange open and transparent on available information	Guide the bidders in all provided information. What information is useful, what information forms background information and what is the status of the provided information? All information could be asked for in case 3 during the information carrousel. The contracting authority gave all information and was open about the available information.
Q	Costs	High bidding costs due to high risk margins due to high risks		-
			Lower bidding costs and low risk margins due to less risks	-

In the interviews the interviewees mentioned one new additional item to the model:

NEW		Undesirable behaviour	Desired behaviour	Because
R	Time	High time pressures for bidders		The interviewed bidders mentioned the time pressure in a tender is very high.
			Reasonable time for bidders	Those bidders will have reasonable time to go through all tender documents. More time should be given and/or less documents should be shared (only useful documents).

In Table 3 the results are linked to the model. For all aspects is showed in what way they came to expression based on experiences in practice. In the interviews as well as in the case studies different reasons are mentioned why a specific aspect of undesirable behaviour is showed. The undesirable behaviour comes to expression by the next items. First, many times the tender is not based on market conditions or market input, thus tenders are not suitable to the conditions. Second, the contracting authority exchanges all information without mentioning which information is necessary or important, leading to uncertainties and high time pressures. Third, tender documents are insufficient and scopes and needs are unclear. This leads to bidder uncertainties. Fourth, contracting authorities are not aware of the difference in information needs between what they think bidders need and what bidders actually need. If bidders ask for clarifications, their questions are badly motivated or answered. Contracting authorities are not willing to help, since the relationship is 'they and us' focussed meaning adversarial, anxious, reluctant and stiff. This comes to expression by using only standard communication channels (tender documents and information notices) in stand of using other channels.

However, the interviews and case studies showed also situations in what the desired behaviour was showed. These situations form success factors. First, in some cases the tender is based on market conditions by keeping a market consultation. Second, the tender documents are of high quality. Using an internal TenderBoard that judged the tender documents on clarity improves the document quality. Third, the information was shared open. The contracting authorities' attitude was open, flexible and cooperative. He used all possible communication channels (such as the tender start-up meeting) to clarify the tender documents and his needs. The Marktvisie guides in how to behave. Fourth, bidders were guided in the exchanged information. For all actions done by the contracting authority and for all shared information the contracting authority thought about why he acts like this or shares this information. It should be useful, 'the intention' is important. Linked to guiding bidders, the information carrousel was successful. The contracting authority exchanged information he thought he should share and gave bidders the possibility to ask for information. To come to a shared understanding, the contracting authority used the concretization phase. In this phase the bidder can clarify his plan of action and come to shared understandings with the contracting authority. Another success factor via which the contracting authority and bidders can come to a shared understanding, is organizing dialogue rounds in what a real conversation takes place.

The ways to shift from undesirable behaviour to desired behaviour can be filled in by abovementioned success factors. These should overcome the showed aspects of undesirable behaviour.

8. Discussion

With the aim of studying the exchange of information in tenders, the current exchange is evaluated by collecting experiences on exchange in tenders as well as influences on the exchange are collected.

Studies on communication and Tender Law showed that the communication process is very important and that communication is possible (Thomas, Tucker & Kelly, 1998; Staatscourant, 2016). The communication process mentions the right information and documents should be sent, but showed also the barriers and filters (such as behaviour and attitude) have a large influence on how the information is sent or interpreted. Tender Law and the tender process mention what communication and exchange is possible. According to these, exchange (digitally) in writing as well as exchange via oral communication is possible during tenders as long as the communication is well documented.

However, other studies showed the exchange of information is ineffective nowadays. The behaviour during this exchange is adversarial, anxious and 'they and us', forming a major barrier in exchanging information. As earlier mentioned, this ineffective exchange is question-answer based (Chao-Duivis, 2008; Assen, 2017), limited information is exchanged due to fear of claims and procedures (Engström, Sardén, & Stehn, 2009; Assen, 2017; Deketh, 2017) and the exchange is cramped expressed in a marginal, minimal and legally forced interaction (Kamminga & Smits, 2012; Timmerman, 2017). Different aspects of this ineffective exchange were mentioned in the model. The counterpart of these aspects forms the aspects of effective exchange. This means the model what is used for this research is based on and limited to the aspects.

By studying the current exchange of information by taking interviews and using case studies, results showed the current exchange is

sometimes ineffective and sometimes effective. The interviewees mentioned most of the time that the current exchange is insufficient. This means the tender documents, needs and scopes are unclear. Besides, questions for clarifications are answered badly motivated and less communication channels are used. The contracting authorities' behaviour is adversarial, anxious and reluctant. Case study 2 showed the same. These results are in line with the situation as described in the problem, meaning the symptoms of ineffective exchange.

Although only twelve interviews were taken via a strict interview protocol and by promising anonymity, what means results of one interview could not be used during another interview, the results seem to correspond with the much larger research of the CROW to the major grievances in the construction sector. Contracting authorities are mostly focussed on their own needs and not on the bidders' needs, they behave defensively, they do not focus on attitude or behaviour and they are not helpful. This part corresponds to the 'they and us' attitude and to not helping the bidders by reducing uncertainties and clarifying elements.

During the interviews the interviewees also mentioned suggestions for improving the exchange or for the factors influencing the exchange. Their suggestions were: changing attitude into open and flexible, answering questions motivated, clarifying needs, less anxious to use other channels, give more time for reading all tender documents, provide only useful information and guide bidders in the information. Those suggestions are in line with one of the current initiatives in the Netherlands, the 'Marktvisie'. The Marktvisie suggests attitudes and behaviours should change from adversarial to open, flexible and 'together'. The contracting authority and the bidders should empathize each other's roles. Other aspects of the Marktvisie are dialoguing, sharing risks, being open and transparent on the available and the needed information, investing in knowing each other's needs and sharing information (Rijkswaterstaat, 2016). Using the suggestions in mind can do a shift from undesirable behaviour to desired behaviour.

That the suggestions and the Marktvisie can work is shown in the case studies 1 and 3. The success factors from those cases were: use the market conditions via a market consultation to base a tender on the market conditions, use an internal TenderBoard to improve the quality of the tender documents, use all communication channels, change your behaviour to an open, flexible and cooperative attitude, use the Marktvisie for how to behave, guide bidders in the information by using 'the intention', reduce bidder uncertainties by using the information carousel, use the concretization phase to come to shared understandings and dialogue to come to shared understandings.

Using all communication channels came to expression by using also the market consultation and the tender start-up meeting to improve the tender documents and the tender and clarify the scope and needs. Using the market consultations seems only useful for complex projects. Despite, it will cost time and money. For most of the contracting authorities time should be as short as possible and costs as low as possible. However, using the market consultation can be useful. Besides, it is possible to use different channels to exchange information in a tender. The tender start-up meeting can help to clarify needs, scopes or tenders. The internal TenderBoard helped to sharpen the documents. This TenderBoard costs time and work, but sharpens the tender and will reduce the uncertainties. Focus on collaboration and the aspects from the Marktvisie on attitude and behaviour helped to behave open, flexible and collaborative. This behaviour resulted in thinking in each other's needs, in a better clarification of uncertainties and in helping the bidders to provide the best submissions. This change is necessary to become more effective. Thinking of each other's needs came into expression by only providing useful information by 'the intention' and by using an information carousel. Also using the concretization phase to come to a shared understanding with the preferred bidder and to show how the submission will be realized will help to come to a more effective exchange and to come to a better realization. Only having dialogue rounds cannot be used in this research any more. Dialogue rounds helped to come to shared understandings and cooperation by having real conversations in case 1 and 3, but is not allowed to use in the standard procedures.

To this, using the abovementioned success factors and the reasons why the desired behaviour is shown, as mentioned in Table 3 seems to be necessary to make the exchange more effective by shifting from the undesirable behaviour to the desired behaviour. Only the dialogue rounds will not be used.

9. Conclusion

The aim of this research is to find ways to shift from 'undesirable behaviour' to 'desired behaviour'. In this way the exchange between the contracting authority and the bidders during tenders become more effective. This research provides insights into the current way of exchanging information, shows how to come to a more effective exchange and provides substantiated ways to implement effective exchange in the current way of working.

Research has shown that the exchange of information is experienced in general as ineffective and insufficient. Also the research done by the CROW to the major grievances in the construction sector recognizes this. The ineffective exchange is a result of different elements. First, the tender documents are insufficient, because the contracting authorities' needs are unclear and/or the scope is vague. Also the possibility exists that information is exchanged that is unusable for the submissions or that information is not exchanged bidders suppose they will need. This causes uncertainties and risks, with possibly unsuitable submissions by the bidders.

Second, the contracting authorities used most of the time limited possibilities to communicate and exchange information. While the ARW2016 and the tender procedures give the possibility to communicate digitally in writing for the essential elements of a tender (tender documents and submissions) as well as to communicate oral for all other elements of the tender and to use many different communication channels (market consultation, tender start-up meeting, information notices and bilateral information rounds), exchange is most of the time digitally in writing via tender documents and information notices. The other channels are useful, but they are used limited because of the contracting authorities' attitude. This attitude forms the third element of ineffective exchange. The attitude can be described as anxious, reluctant, stiff and adversarial, although two contracting authorities mentioned their attitude is well and should not be changed. The authority is afraid for claims and procedures. These attitude and behaviour form a major barrier in the exchange of information.

From research suggestions were done to let the exchange become more effective by shifting to the desired behaviour. Those suggestions are on needs and information (clarifying needs, give time to read all information or provide only useful information and guide bidders), on attitude (behave open and flexible) and on channels (less anxious to use other channels). Also the Marktvisie mentions more or less the same suggestions.

To come to a more effective exchange of meaningful information and shared understandings, contracting authorities should inform and involve proactively in tenders. They should change their attitude by behaving open, flexible and collaborative. The Marktvisie helps in how to behave during a tender. Communication and exchange are allowed (digitally) in writing as well as by oral communication and the contracting authority should use all communication channels to clarify his needs and the scope to come to shared understandings. This means the market consultation should be used to set up a clear tender suitable to the market conditions and a tender start-up meeting is necessary to additionally clarify the tender. That these points will work is shown by the case studies 1 and 3. An internal TenderBoard helped to sharpen the focus in the tender documents. The cases used different communication channels to exchange information, to clarify needs and to come to shared understandings. During this exchange the intention is kept in mind and to reduce bidders' uncertainties or to fulfil bidders' needs the information carousel was used. To come together to a shared understanding the concretization phase was used.

Based on these, the following points of action should be taken to shift from the undesirable behaviour to the desired behaviour:

1. Consider executing a market consultation before starting a tender procedure to feel market conditions, to collect knowledge and to fit the tender to these conditions.
2. Come to an effective exchange of information, by sharing meaningful information and by fully facilitating the sharing of understandings with regard to the information. Check if there is a shared understanding.
3. Make full use of all communication channels available. Be aware that the exchange of information through oral communication (either bilateral or unilateral meetings) is legally allowed. Be aware that oral communication forms the richest communication medium to come to the sharing understandings.
4. Bidders are dependent on the information that is provided to them. Clarify if they have questions. Keep in mind the difference between what information the contracting authorities suppose the bidders will need and what the bidders actually need.
5. Make sure that you fully clarify the needs and the scope in the tender documents.
6. While exchanging information, change your attitude from 'they and us' to 'together', by having an open, flexible and collaborative attitude.
7. Make use of 'the intention'. Why do we do this this way? Explain your choices and motivate them.
8. Consider implementing a concretization phase in the tender to give the opportunity to the preferred bidder to detail his plan of action and to come to a shared understanding between bidder and contracting authority on the contract (scope and needs).

10. Recommendations

To shift the behaviour from undesirable to desired and additionally improve the exchange to become more effective, changes are needed on clarifying needs and scopes, on attitude and on the usage of communication channels. To do this, several points of action are mentioned in the conclusion. The cases 1 and 3 have expressed using (partly) those points of action in the way of working can improve the submissions of bidders. The points of action come to expression in the recommendations below. For all recommendations is mentioned in what phase of the working process of Royal HaskoningDHV they can be used.

Use all communication channels

Make fully use of all communication channels to clarify the contracting authorities' needs, the scope of the tender and to come to a shared understanding on these. Prior to a tender procedure, the market consultation should be used to feel the market conditions, to collect suggestions and to create a tender fitting these market conditions (*point of action 1*).

During the tender procedure (digitally) in writing as well as oral communication can be used to exchange information. Oral communication is allowed for all elements of the tender procedure, except the essential elements (tender documents and submissions). Oral communication is the richest communication medium and can help in coming to shared understandings. The tender start-up meeting should be used to additionally explain and clarify the tender documents, the scope and the needs. Questions for the information notices should be answered motivated. Other communication channels, such as individual or bilateral information rounds can also be used (*point of action 3*).

The market consultation can be used in working process phase 1 – providing information – only to set up a suitable tender. The use of the other communication channels is possible during the other two phases (phase 2 and 3).

Use an internal TenderBoard

Know the bidders base their submissions on the provided information. This means information, such as the tender documents, is very important to them. The tender documents should contain the contracting authorities' needs and the scope of the tender. Indicate what you have in mind with the tender (*point of action 5*). Make the tender documents (needs and scope) more clear and sharpen them by using an internal TenderBoard. This TenderBoard consists of different persons not linked to the tender, which should understand via the tender documents what the contracting authority wants.

The internal TenderBoard is only useful during working process phase 1 to check tender documents and to sharpen the focus in these documents.

Work in line with the Marktvisie

It is important to overcome the adversarial relationships in the construction sector and the 'they and us' thinking. The Marktvisie is a vision on how to overcome the adversarial relationships in the construction sector. It suggests attitudes and behaviours should change from adversarial to open, flexible and 'together'. The contracting authority and the bidders should empathize each other's

roles. Having meaningful conversations, sharing risks, being open and transparent on the available and the needed information, investing in knowing each other's needs and sharing information are important elements of the Marktvisie. Working according to the Marktvisie creates awareness on how to behave and how to work in a tender (*points of action 2 / 3 / 4 / 6*).

Working in line with the Marktvisie means having an open and cooperative attitude. This recommendation can be used in all phases of the working process.

Information carousel

Make use of the information carousel. The information carousel overcomes the unawareness of bidders' needs and reduces the bidders' uncertainties on scope or on needs. Bidders have another information need than the contracting authority thinks they have. Provide as contracting authority information you think the bidders need for the tender and give them the possibility to ask for additional information the bidders think they need. Setting up an information carousel can help. This consists of a bilateral information round in what the bidders one by one can ask for information. The contracting authority provides the requested information. If information is not available, they should be open and transparent on this. It is necessary to share all requested information to all bidders because of the principles of tendering. The option of an information carousel seems most suitable to the restricted procedure because of the amount of bidders (*points of action 2 / 4*).

Since the information carousel is on different information needs and on exchanging necessary information bidders need, this recommendation seems useful at most in phase 1 of the working process.

The Intention

Make as contracting authority use of the 'intention'. This intention means the contracting authority should keep in mind why he acts in the way he will act or why he shares that specific information. This means the contracting authority takes all his actions in consideration if it is necessary or meaningful. The intention shifts the focus to only sharing meaningful information and helps bidders in reducing uncertainties by only sharing essential information (*point of action 7*).

The intention is useful in all phases of the working process. In phase 1 to share only necessary or useful information. In all other phases to check why a specific action is done.

Concretization phase

Use the concretization phase to come to a shared understanding. Implementing the concretization phase means the contracting authority awards the tender to a preferred bidder and starts a conversation with this bidder. During the concretization phase the bidder has to show how he will realize his plan of action and he can further detail it. Besides, the conversation helps to come to a shared understanding on the contract, meaning shared understandings on the scope and needs. This phase helps to improve the realization (*point of action 8*).

The concretization phase can be part of phase 3 (use of communication tools). During the tender it is a pre-selection element, to come later to shared understandings with the preferred bidder.

Make use of reflections

It seems quite useful to look at other projects, successful projects as well as less successful projects. Reflect a tender intern as well as with the bidders after the tender is awarded. Use the reflections in a next tender. Success factors can be used in the next tender and bad scored factors in a tender can be improved in a next tender.

Reflections should be done at the end of a tender.

Reflect the recommendations

Additionally it is important to reflect the effects of abovementioned recommendations. Reflect on if the recommended points of action come positively to expression and if these give what is intended. If the points of action do not work, search why they do. If they work, check why they work and hold this!

11. Bibliography

- Assen, R. (2017, February 7). Praktijkervaring communicatie tijdens de aanbesteding, verkennend interview. (S. Meijlof, Interviewer)
- Black, C., Akintoye, A., & Fitzgerald, E. (2000). An analysis of success factors and benefits of partnering in construction. *International Journal of Project Management*, 423-434.
- Chao-Duivis, M. (2008). *Quickscan contactmomenten in aanbestedingsprocedures*. Instituut voor Bouwrecht.
- CROW. (2017, April). *Nationale Enquête: Grootste grieven in de infrasector*. Retrieved from Kennisplatform CROW: <https://www.crow.nl/downloads/pdf/aanbesteden/grootste-grievens/resultaten-24-april-2017-v1-02.aspx>
- Daft, R., Lengel, R., & Trevino, L. (1987). Message Equivocality, Media Selection and Manager Performance: Implications for Information Systems. *MIS Quarterly*, Vol. 11, No. 3., 355-366.
- Deketh, J. R. (2017, February 6). Praktijkervaring communicatie tijdens de aanbesteding, verkennend interview. (S. Meijlof, Interviewer)
- Dorée, A., Holmen, E., & Caerteling, J. (2003). Co-operation and competition in the construction industry of The Netherlands. *19th Annual ARCOM Conference* (pp. 817-826). Brighton: Association of Researchers in Construction Management.
- Egan, J. (1998). *Rethinking construction*. London: Department of the Environment, Transport and the Regions and HMSO.
- EIB. (2013). *EMVi, tenzij... Emvi en de aanbestedingswet*.
- Engström, S., Sárdén, Y., & Stehn, L. (2009). Towards improving client-contractor communication in industrialised building. *Procs 25th Annual ARCOM Conference* (pp. 21-30). Nottingham: Association of Researchers in Construction Management.
- Eriksson, P. (2008). Procurement Effects on Cooperation in Client-Contractor Relationships. *Journal of Construction Engineering and Management*, 103-111.
- Eriksson, P. (2011). Effects of cooperative procurement procedures on construction project performance: A conceptual framework. *International Journal of Project Management*, 197-208.
- European Commission. (2016, December 13). *Public contracts - Rules & Procedures*. Retrieved February 27, 2017, from Europa.eu/youreurope: http://europa.eu/youreurope/business/public-tenders/rules-procedures/index_en.htm
- European Parliament and Council. (2004, March 31). *Directive 2004/18/EC*. Retrieved February 13, 2017, from EUR-Lex: <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32004L0018>
- European Parliament and Council. (2014, February 26). *Directive 2014/24/EC*. Retrieved February 13, 2017, from EUR-Lex: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L._2014.094.01.0065.01.ENG
- Hoezen, M., Reymen, I., & Dewulf, G. (2006). The problem of communication in construction. *CIB W06 Adaptable Conference*. Eindhoven.
- Kadefors, A. (2005). Fairness in interorganizational project relations: norms and strategies. *Construction Management and Economics*, 871-878.
- Kamminga, Y., & Smits, S. (2012). *Aanbesteding een goede basis voor samenwerking? Een analyse van aanbestedingsregelgeving vanuit samenwerkingsperspectief*. Bouwrecht.
- Laryea, S. (2011). Quality of tender documents: case studies from the UK. *Journal of Construction Management and Economics*, 275-286.

- Mason, J. (2007). The views and experiences of specialist contractors on partnering in the UK. *Construction Management and Economics*, 519-527.
- Mitkus, S., & Mitkus, T. (2014). Causes of conflicts in a construction industry: a communicational approach. *Procedia - Social and Behavioral Sciences*, 777-786.
- Rijkswaterstaat. (2016). *Marktvisie*. Retrieved February 23, 2017, from Marktvisie: <https://www.marktvisie.nu/wp-content/uploads/2016/12/De-Marktvisie-1.pdf>
- Shannon, C. (2001). A Mathematical Theory of Communication* - *Reprinted for the Bell System Technical Journal with corrections. *Mobile Computing and Communication Review*, 3-55.
- Staatscourant. (2016, May 1). *Aanbestedingsreglement Werken 2016*. Retrieved March 1, 2017, from Rijksoverheid: <https://www.rijksoverheid.nl/documenten/richtlijnen/2016/05/01/aanbestedingsreglement-werken-2016>
- Thomas, S., Tucker, R., & Kelly, W. (1998). Critical Communications Variables. *Journal of Construction Engineering and Management*, 58-66.
- Timmerman, A. (2017, February 10). Praktijkervaring communicatie tijdens de aanbesteding, verkennend interview. (S. Meijlof, Interviewer)
- Wang, H., & Doong, H. (2014). Revisiting The Task-Media Fit Circumflex: A further examination of negotiation tasks. *Information & Management*, 738-746.

Appendix

This appendix extensively describes the working process of Royal HaskoningDHV while helping the contracting authorities during a tender. It explains the different ways of working (the roles) the contracting authority uses during three different phases of a tender. These roles are disposed together with Royal HaskoningDHV. Each phase consists of roles, the goal of taking a specific role and the effect of taking this role.

Phase 1. Preparation phase – Providing information.

Collecting information

1. The contracting authority is actively looking for information from the market and bidders will give these information.

Goal: feel interests and gather risks/opportunities.

Effect: suitable tender to market conditions.

Sharing information to bidders

2. The contracting authority exchanges a lot of information without explicitly identifying the usefulness and/or necessity of it.

Goal: provide information.

Effect: useful/unusable information is shared, with high costs, time pressures, vague scopes and different interpretations as a result.

3. The contracting authority is reluctant and/or legally cramped to provide information.

Goal: reduce responsibility and reject claims.

Effect: needs are not clear, uncertainties.

4. The contracting authority reduces the risks of bidders by explaining which information is meaningful.

Goal: help bidders

Effect: essence of tender is clear.

5. The contracting authority does not consider or too little the information needs of the bidders.

Goal: focus on own interests

Effect: difference in the information the contracting authority thinks the bidders need and what they actually need. Essence of tender is unclear with uncertainties as a result.

Phase 2. Sharing understandings – Attitude and behaviour while providing information.

Action bidders reaction contracting authority

1. Bidders are actively looking for information and the contracting authority exchanges this information open, fairly and motivated.

Goal: reducing uncertainties by answering questions motivated.

Effect: understanding of the essence of the tenders, reducing the uncertainties and improving submissions.

2. Bidders are actively looking for information, but the contracting authority exchanges limited information.

Goal: reduce responsibility and reject claims.

Effect: uncertainties on scope and risks, with possibly unsuitable tenders due to equivocality.

3. Bidders propose alternatives and the contracting authority takes these in consideration.

Goal: helping bidders.

Effect: thinking in each other's interests possibly improves submissions or ways of executing the project.

4. Bidders propose alternatives and the contracting authority rejects without considering these.

Goal: plan as proposed should be executed or reducing responsibility and reject claims.

Effect: put relations on edge (we and them thinking), rigid attitude and improved submissions will not be available.

Action contracting authority

5. The contracting authority determines what information the bidders need and exchanges information on this basis.

Goal: exchange information and sharpen focus.

Effect: depends on the exchanged information. Uncertainties remain if the bidders have a different information requirement than the contracting authority thinks. Otherwise, if the requirements are equal, scope and needs can become clear.

Phase 3. Sharing understandings – Use of communication tools.

Use of communication channels

1. The contracting authority communicates (digitally) in writing only with the bidders.

Goal: exchanging information

Effect: amount of shared understandings is lower, uncertainties on scope and needs remain.

2. The contracting authority communicates (digitally) in writing as well as oral with the bidders.

Goal: exchanging information

Effect: creates possibilities to share understandings via a real conversation. Creates clarity on scope and needs.