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I started my study Supply Chain Management seven years ago, with the expectation to finish it within a few years. The first year and half went according plan and I finished most of the courses of the program during that time. However, not everything can be planned in advance and it turned out that finalizing my study took quite a bit longer than anticipated. From the moment I started my first course at the Open University until now, I have changed jobs three times, finished another Masters degree and some other courses, moved across Europe from the Netherlands to Germany, to Switzerland, then to Norway and ultimately back again to Switzerland. The Open University was therefore a perfect match for me and gave me all the flexibility to adjust the studies to my life; at least it seemed to be one of the stable elements during the past few years!

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Stavanger, June 2010
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SUMMARY

Background and problem statement

When the oil prices dropped at the end of 2008, the oil and gas industry was challenged to find alternative ways to maintain their profitability. In project based industries, such as the oil and gas industry, delivering complex projects requires main contractors to purchase sub-projects and expertise from external suppliers (Martinsuo and Ahola, 2009). Companies in the industry spend around 80% to 90% of its costs on contractors, making it an interesting area to search for cost efficiency and further improvements. Complex procurements involve a large number of actors, they are often associated with a high degree of uncertainty and technological complexity, and will often take several years (Nevi, 2004). Complexity usually prevents the buyer from simply buying discrete components (including service systems) and combining them together. This means that the buying process cannot be accomplished by the serial and additive transaction mode of traditional (manufacturing) procurement (Caldwell et al, 2009). In the oil and gas industry companies have explored the use of contracts and governance mechanisms for handling their complex procurements (Olsen et al, 2005). Even though many studies have researched the impact of governance mechanisms (Caniëls and Gelderman, 2010), there is a lack of studies that took up research into the simultaneous use of several governance mechanisms, which is especially the case for the oil and gas industry (Olsen et al, 2005). The purpose of this study is to better understand:

the interplay of different governance mechanisms in complex procurement projects?

Literature

Governance mechanisms are safeguards against opportunism that firms put into place to govern inter-organizational exchange (Jap and Granesan, 2000). Three types are (1) contract/incentives, (2) authority and (3) trust. These mechanisms are usually applied in combination with each other. Companies use governance mechanisms to safeguard their interests. Contracts/incentives and authority are formal governance mechanisms (Yu et al, 2006), while trust is relational governance (Zaheer and Venkatraman, 1995). The governance mechanisms (trust and contractual governance) are believed to affect the conditions that facilitate inter-organizational creativity (resources, motivation, and management practices) in buyer-supplier relationships (Wang et al, 2008). Project outcomes are measured though time (schedule), costs and quality (Munns and Bjeirmi, 1996; De Wit, 1988).

It is generally agreed that there is a complementary effect when applying multiple governance mechanisms (Poppo and Zenger, 2002). Contractual and relational governance should be considered as complementary mechanisms (Ferguson et al, 2005). Since both types of governance mechanisms have different origins, they serve a different functionality and are complimentary in their distinct roles in promoting exchange performance.
Methodology

Many contracts in the oil and gas industry are characterized by long lead times, high costs and uncertainties. The problem statement requires a design which is suited for an exploratory study since not much theory is available in this area. A case study has been conducted on a complex procurement project in the Norwegian offshore oil and gas industry. The case study involved a total number of ten in-depth semi-structured interviews with key respondents, which were employed by the initial operator, the second operator and the integrator. Additionally, the study is based on the available documentation and archival records such as contracts and project monthly reports.

Results

The project had many problems with cost overruns and schedule delays, although the end result had a quality level as agreed. Respondents gave relatively low scores for the governance mechanisms ‘contract/incentives’ and ‘authority’. The results for ‘trust’ were mixed, since the trust between the operators appears to be low, while the trust is high between the operator and the integrator. The following interplay effects were found in this study:

- A high trust level has a negative effect on contract/incentives and on authority. In case of much trust, parties have less need for incentives or contracts. However, this ultimately resulted in a negative effect on the project outcomes, similarly vice versa.
- Low authority has a negative effect on contract/incentives and on trust. It appears that in case of low authority, less effort is put into the contract and the incentives. However, since no control system is in place, ultimately this resulted in lower trust and poor project outcomes.

These interplay effects differ from the comparable study of Olsen et al (2005) on two cases in the Norwegian oil and gas industry. However, the empirical findings of this study do confirm that interplay effects indeed exist between the governance mechanisms. Different governance mechanisms are mutually dependent, and they affect each other. Different governance mechanisms are thus not only complementary, but they can also function as facilitators for each other. This is in line with the results of Poppo and Zenger (2002) who found that higher relational governance affects contractual complexity positively, which in turn also increases the exchange performance. Each mechanism performs better when accompanied by the other.

Recommendations

From a managerial perspective the knowledge that governance mechanisms also affect each other requires strategies in advance on how to use the governance mechanisms to have optimal results, rather than applying those in isolation. In order to obtain good project outcomes, all three mechanisms must be jointly developed and tailored to each other. The next step should be to develop prescriptions for the
use of various governance mechanisms in different circumstances, to meet the managerial needs to find the optimal application of the governance mechanisms for the best results.

Since this study was based on one case study the results should be interpreted with cautiousness. The results cannot be generalized to other complex procurement project, in particular because the results from this research differ from the results of the two cases studied by Olsen et al (2005). Further research is needed to extent the knowledge in this field and to be able to generalize the results. More cases of complex procurement should be studied and compared. In future research to gain a complete perspective of the projects, it is recommended to include the subcontractors as well. Additionally, it would give an interesting view on how the governance mechanisms affect the project partners further in the supply chain.

Finally, explicit research is recommended about the role of trust in relation to the other governance mechanisms to provide further insights on the pre-mature conclusion that trust is a key factor in the application and choice of governance mechanisms.
1. INTRODUCTION

1.1 Governance mechanisms in the oil and gas industry

The oil and gas industry was challenged end of 2008 because of the decreasing oil prices. The lower oil prices resulted in a lower profitability in the oil and gas industry. Especially the offshore industry was affected in comparison to the onshore industry, because the offshore industry is characterized by a high cost level and a long lead time from exploration to production. The offshore industry is thus even more challenged to come up with solutions that could make the industry less vulnerable in periods of low oil prices.

In project based industries, such as the oil and gas industry, delivering complex projects requires main contractors to purchase sub-projects and expertise from external suppliers (Martinsuo and Ahola, 2009). In general the oil and gas industry spends around 80 to 90% of the costs on contractors, meaning that it accounts for a significant part of all costs. Since 2003 the rig industry worldwide has experienced a steady growth of the costs due to the rising oil prices. This makes it an opportunity area to explore further potential cost savings. Therefore the use of contracts and governance mechanisms for handling complex procurements was one area the industry investigated for possible improvements (Olsen et al., 2005).

![Crude Oil Prices 1998 – 2009](image)

Figure 1: Development of oil prices in the last decade. Source: EIA

Governance mechanisms are ways to influence the exchange partner and to establish good order and coordination in a business relationship (Hennart and Anderson, 1993). The three governance structures are traditionally associated with three different mechanisms (Bradach and Eccles, 1989; Adler, 2001):

- Market with price and incentives,
- hierarchy with authority and
- hybrids with trust.
Empirically observed arrangements often rely on a mix of price, authority, and trust (Bradach and Eccles, 1989; Hennart and Anderson, 1993; Foss, 2002). Accordingly, trust and authority can be utilized to some extent in the governance of a market transaction even if the main mechanism is price. All three mechanisms have both advantages and drawbacks (Adler, 2001), and there are supplementary relationships between them (Spekman, 1988; Das and Teng, 1998).

The isolated use of governance mechanisms doesn’t represent a real situation in which several safeguarding measures will be used in combination. Much research has been done about the application and effects of governance mechanisms, such as the role of governance on the creativity in buyer-seller relationships (Wang et al, 2008). The results indicate that the governance mechanisms (trust and contractual governance) significantly affect the conditions that facilitate inter-organizational creativity (resources, motivation, and management practices) in a buyer–seller relationship.

Since the isolated use of governance mechanisms is not representative for real cases, some researchers have started to explore the complimentary effects of using multiple governance mechanisms. For example Poppo and Zenger (2002) concluded that formal governance systems (e.g. contracts and investments) and informal governance systems (e.g. trust and norms) function as complements, rather than substitutes, in generating higher exchange performance. The combined usage of multiple safeguards is only researched in a few studies (Achrol and Gundlach, 1999; Jap and Ganesan, 2000). However even these studies have certain limitations. The study of Achrol and Grundlach (1999) for example is based only on a simulation study, and the study of Jap and Ganesan (2000) focuses on the interaction of several safeguards with transaction-specific investments of the supplier (Caniels and Gelderman, 2010). This means that both studies seem to fall short of researching the simultaneous use of the three governance mechanisms (Caniels and Gelderman, 2010).

Olsen et al (2005) also indicate a gap in the literature regarding the interplay between the different mechanisms, which they have called a multiplier effect. Their empirical findings show that incentives, authority and trust complement each other, and furthermore, that there is a complex interplay between the specific uses of the different mechanisms. Multiplier effects have not previously been addressed in the literature, and this study contributed to the knowledge about inter-firm governance by showing that governance mechanisms affect each other. Olsen et al (2005) conclude that the proper use of one mechanism improves the use of other mechanisms, while inadequate use of one mechanism hampers the use of other mechanisms. They recommend to further study the complex interplay of different mechanisms, and to add to the body of knowledge in this area, specifically on other cases in the oil and gas industry. This study builds further on the research of Olsen et al (2005) investigating the existence of multiplier effects in governance mechanisms.

1.2 Problem statement

Complex procurements involve a large number of actors, they are often associated with a high degree of uncertainty and technological complexity, and will often last for several years (Nevi, 2004). Complexity usually prevents the buyer from simply buying discrete components (including service systems) and
combining them together. This means that the buying process cannot be accomplished by the serial and additive transaction mode of traditional (manufacturing) procurement (Caldwell et al, 2009). A relative large portion of the procurements in the oil and gas industry are in fact complex procurements. When the oil prices dropped at the end of 2008, the industry was challenged to find alternative ways to maintain their profitability. Companies in the industry spend around 80% to 90% of its costs on contractors, making it an interesting area to search for cost efficiency and further improvements. In the oil and gas industry companies have explored the use of contracts and governance mechanisms for handling their complex procurements (Olsen et al, 2005). Even though much research has explored the impact of governance mechanisms (Caniëls and Gelderman, 2010), there is a lack of studies that took up research into the simultaneous use of several governance mechanisms, which is especially the case for the oil and gas industry (Olsen et al, 2005). The purpose of this research is to better understand the use of governance mechanisms for handling complex procurements. The problem statement is:

*What is the interplay of different governance mechanisms in complex procurement projects?*

Deriving from this problem statement the research questions are defined and described in the next section.

### 1.3 Research Questions

Following from the introduction and the problem statement the following research questions are defined:

1. What are the effects of governance mechanisms?
2. What is the complementary effect of using multiple governance mechanisms?
3. Is there an interplay (multiplier) effect when applying (multiple) governance mechanisms?

The first two research questions are answered through the available theory. The relevant literature in the field of governance mechanisms, and complementary effects specifically, describe the different mechanisms and whether governance mechanisms have a complimentary effect when using multiple mechanisms at the same time. The third research question is answered through exploratory research with a case study.

The case is a complex procurement project, within the offshore oil and gas industry of Norway: multiple actors were involved and the duration of the project was 6 years combined with a high investment. The steps undertaken in this study:

1. Research about procurement in the oil and gas industry in general to place the research in the correct perspective.
2. Then more specifically the case is studied based on the available project archives and documentation, such as the contracts with the contractor and subcontractors and progress reports.
3. In addition interviews are conducted with the relevant parties of the project to understand what happened during the project and why. These interviews were mainly conducted face to face with a pre-defined list of questions.

Figure 2 shows an overview of the research questions and how they are answered in the research.

![Diagram showing research plan]

**Figure 2: Research plan**

More detailed information about the research methodology can be found in chapter 3.
2. **GOVERNANCE MECHANISMS IN COMPLEX PROCUREMENTS**

This chapter answers the research questions formulated in the previous chapter based on the available theory. The first three sections give a background understanding of complex procurement and the definition, more information about the oil and gas industry and procurement in this sector. Section 4 provides a theoretical framework of governance mechanisms.

Based on that, sections 5 and 6 answer the first two research questions:

1. What are the effects of governance mechanisms?
2. What is the complementary effect of using multiple governance mechanisms?

The last section concludes with a preliminary answer for the third research question and forms the starting point for further research:

3. Is there an interplay (multiplier) effect when applying (multiple) governance mechanisms?

### 2.1 COMPLEX PROCUREMENTS

The Dutch professional organization for Purchasing defines Procurement as:

The acquisition of goods and/or services at the best possible total cost of ownership, in the right quality and quantity, at the right time, in the right place and from the right source for the direct benefit or use of corporations, individuals, or even governments, generally via a contract, or it can be the same way selection for human resources. Simple procurement may involve nothing more than repeat purchasing (Nevi, 2004).

Complex procurements involve a large number of actors, they are often associated with a high degree of uncertainty and technological complexity, and will often last for several years. Complex procurement could involve finding long term partners – or even 'co-destiny' suppliers that might fundamentally commit one organization to another (Nevi, 2004).

In this context complexity is regarded as that which prevents the buyer from simply buying discrete components (including service systems) and combining them together. This means that the task cannot be accomplished by the serial and additive transaction mode of traditional (manufacturing) procurement (Caldwell et al, 2009).

The next sections will show that a big portion of the procurements in the oil and gas industry are in fact complex procurements.
2.2 The Offshore Engineering Process

The development of an offshore oil or gas reserve can take a long period of time. It sometimes takes as many as thirty years to develop a field. The production system required for this development starts at the wells and continues to the final sales point. Production systems typically include wells, flowlines and/or an onshore export facility (Halman and Braks, 1999). The offshore engineering process consists of eight phases: (1) exploration, (2) design, (3) fabrication, (4) transportation and installation, (5) drilling, (6) hook up and commissioning, (7) production and finally (8) abandonment (Leffler et al, 2003).

To start the construction of an offshore platform, it is necessary to explore the oil or gas field and to investigate whether the project is commercially feasible. One of the activities in the (1) exploration phase is an orientation of which parties to involve in the project (Halman and Braks, 1999).

In the (2) design phase a production system is designed. The design phase consists of three sub-phases, in which each phase will result in a more detailed cost estimate and more detailed design. Each of the phases is a decision gate (go/no go). The three sub phases:

1. Basis for Design (BFD) specification (source Shell).
2. FEED (Front End Engineering Design) which leads to a rough design. Main objective in this phase is to get an estimation of the price to enable a decision to move forward with the project. At the end of FEED 10-20% of the total budget will typically have been spent (source Shell).
3. Detailed design phase consists of the construction of the platform (the body work) and the process design. The objective is to achieve enough detail to be able to actually build it (source Shell).

In the (3) fabrication phase pre-fabricated parts of the platform, such as a template, jacket, topsides and sub-sea manifolds are fabricated at a yard onshore (Devereux, 1999).

Then follows the (4) transportation and installation phase where the pre-fabricated components are loaded into special transportation barges and towed to the offshore location where they are assembled into complete platforms (Leffler et al, 2003; Devereux, 1999).

The final phase is (5) hook-up and commissioning before the platform is operational and where all the services and systems on the platform are activated. In the (6) drilling phase, pre-drilling activities are executed and the first oil or gas is recovered. After the pipes are in place, the production on the platform can start. In the (7) production phase, the oil or gas is pre-processed for transport to onshore. The oil and gas is further processed at the refinery (Devereux, 1999; Busby, 1999). When the reservoirs have been drained, the platform will be removed and dismantled during the (8) abandonment phase (Leffler et al, 2003).
2.3 PROCUREMENT IN THE OIL AND GAS INDUSTRY

The oil and gas industry characterizes complex procurements due to the long lead times and high costs involved. In many cases the procurement is technically very complex and uncertain as each project is unique. This type of exchange setting can be labeled hazardous, because the exchange specifications cannot be fully described in advance due to technological complexity and the fact that each new oil platform is more or less unique (Olsen et al, 2005).

Some 80-90% of exploration and production spending is outsourced to oil field service companies (Raymond, 2006). This means that procurement is a very important aspect within the industry and has an enormous impact on the profitability.

A key managerial challenge is to craft contracts or governance arrangements that are capable of coping with the before mentioned pitfalls (Williamson, 1985, 1991).

Traditionally oil companies (operators) have entered into a number of individual contracts with each contractor, meaning the operator manages the contract on a one-to-one basis. For each different phase and task in the project the operator would have a new contractor, meaning that for each contractor a separate project organization was required.

A new contracting concept was developed in the early eighties: EPIC (Engineering, Procurement, Installation and Construction). With this concept the exposure of interfacing between individual contractors was sub-delegated to one particular main contractor, also called integrator. The main contractor/ integrator in turn subcontracted the various work packages to the discipline subcontractors. A main contractor/integrator is responsible for the coordination of the subcontractors. This contractor carries the project risk for schedule as well as budget in return for a fixed price (lump sum). Normally, the main contractor/integrator will enter into individual contracts with each subcontractor. This concept...
proved also to be unsatisfactory for the operator because the main contractor successfully excluded the financial exposure resulting from the interfacing between various subcontractors from its contract with the operator. However the problem was only shifted and not solved. Additionally it didn’t bring cost savings for the operator (Halman and Braks, 1999).

Because the existing contractual approaches were not satisfying the oil companies changed this approach in the mid-1990s. New contractual forms such as “integrated project organizations” or “alliances” were used. It replaced the traditional interfaces between contractual parties with a more effective integration of resources. In such contract the operator and all contractors involved are responsible for how the tasks are divided between the actors, and for coordination between phases and actors [figure 6] (Olsen et al, 2005).

The common rationale was to smooth coordination between all parties involved (operators, contractors, subcontractors and vendors), and thereby reduce costs, increase quality and shorten production time. The operator enters a contractual relationship with several contractors, based on a mutual sharing of risks, rewards and resources. The operator has the role of an equal partner, as opposed to having the customer role in individual and EPCI contracts (Olsen et al, 2005).

As stated previously procurements in the oil and gas industry are usually complex, such as building a new offshore platform or rebuilding one. Complex procurements in the oil and gas industry consist normally of 4 phases (which can be executed in parallel):

1. Engineering
2. Fabrication
3. Installation
4. Commissioning

In the engineering phase plans and specifications are first worked out. This is followed by the procurement or production of the different parts in the fabrication phase. In the installation phase the different parts are then installed on the platform. Finally, the platform is moved to its specific location offshore in the commission phase and it is made ready for usage. This requires extensive coordination between the different phases and actors. The technological complexity combined with the uniqueness of each new project make it difficult to describe in advance the exact work. As a result it is difficult to estimate costs, or delivery time and the actors don’t know how well it will function before production offshore is started. It is thus often associated with specialized investments. It is difficult to measure performance and a high degree of uncertainty is present. Designing contracts with governance mechanisms that are capable of handling these hazards is challenging (Williamson, 1985, 1991).

The traditional contracts used to be based on individually-issued sub-contracts by the operator (oil and gas company) towards the discipline contractors. The problem with this concept is the clashing interfaces between separate subcontractors who mainly looked after their particular interests, which led to inefficiency and budget overruns for the operator.
A significant increase in the EPCM contract procurement route for international infrastructure and major construction works has occurred only recently. The key difference between an EPCM and an EPC contract is that an EPC contract is a design and construct where a single contractor takes responsibility for all elements of design, construction and procurement. Under an EPCM contract, other parties construct the project (the EPCM contractor is not the builder/constructor) (Loots and Henchie, 2007). The EPCM contract is a cost reimbursable contract, usually with a target price pain/gain share mechanism built in (Loots and Henchie, 2007). All forms of EPCM contracts involve multiple contracts with multiple interfaces (Branconi and Loch, 2004).

2.4 Governance mechanisms

Governance mechanisms are safeguards that firms put in place to govern inter-organizational exchange, minimize exposure to opportunism\(^1\) and protect transaction specific investments (Jap and Granesan, 2000). These mechanisms are used in organizational exchanges such as procurement.

The theory distinguishes in general three different governance mechanisms. This research is based on the three governance mechanisms used by Olsen et al (2005):

1. (Market) Incentives - Contract
2. Hierarchical mechanisms - Authority
3. Social mechanisms - Trust

Governance mechanisms provide safeguards in a buyer-seller relationship (Wang et al, 2008). The use of market mechanisms is reflected by price and contracts, while authority means the reliance on organizational mechanisms such as rules and procedures. Trust, on the other hand, implies monitoring transactions by social norms and the development of personal relationships. (Haugland and Reve, 1994)

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\(^1\) Opportunism is defined by Williamson (1985) as the incomplete or distorted disclosure of information, especially to calculated efforts to mislead, distort, disguise, obfuscate or otherwise confuse.
Market incentives and hierarchical mechanisms are seen in the transaction cost economy as alternative means of structuring buyer-seller relationships. The theory explains efficient governance structures based on certain transactional characteristics. The relational contract theory, on the other hand, address the behavioral or social dimensions of buyer-seller relationships. (Haugland and Reve, 1994)

As described before, the theory in general distinguishes three governance mechanisms, but they are named differently. For example Caniels and Gelderman (2010) differentiate the following:

1. Administrative control, through explicit contractual agreements (Lusch and brown, 1996), which is comparable with contracts or incentives
2. Exchange governance through power and self-interested commitment (Nooteboom, 2000), similar to power or authority.
3. Trust Social/relation control, through relational norms (Heide and John, 1992), which is comparable to trust.

Bradach and Eccles (1989), in a review article, suggest that price, authority and trust are three major governance mechanisms used in organizing inter-firm transactions. Price reflects the market mode of exchange while authority reflects the hierarchical dimensions. Trust, on the other hand, refers to the use of social norms and personal relationships which are examples of behavioral dimensions. According to Bradach and Eccles (1989), elements of price, authority and trust can be used in different combinations.

The contractual mechanism refers to governance by explicit, legally enforceable contractual terms. The authoritative mechanism involves one party in a buyer-seller relationship using its power to control the activities of the other party. Trust is the manifestation of a shared set of norms. (Wang et al, 2008)

The three governance mechanisms can be classified as formal and informal governance mechanisms. Formal governance mechanisms are contracts and financial commitments (Yu et al, 2006). Relational governance is defined as interfirm exchanges which include significant relationship-specific assets, combined with a high level of interorganizational trust (Zaheer and Venkatraman, 1995).

The next two sub sections will describe the formal (incentives and authority) and informal (trust) governance mechanisms in more detail.

### 2.4.1 Formal governance: incentives and authority

Both authorative (power) and contractual (incentives) governance mechanisms provide clear directions for the appropriate processes and activities to be undertaken by the parties (Wang et al, 2008).

The dominant theoretical logic for explaining inter-organizational change is the transaction cost economics (TCE) perspective. Assuming opportunism and bounded rationality (Rindfleisch and Heide, 1997), TCE asserts that firms attempt to minimize transaction costs by ‘assigning transactions (which differ in their attributes) to governance structures (the adaptive capabilities and associated costs which differ) in a discriminating way’ (Williamson, 1985). TCE argues that parties have to safeguard against the hazard of opportunism by applying legal contracts, specifying what is acceptable and what is not, with
threats of legal enforcement or non-legal retribution (Williamson, 1975). Williamson describes long-term contracting as a hybrid institutional mode. The governance issues are handled by some use of market incentives and some use of an administrative apparatus. In this way the hybrid mode can be described as partly market and partly hierarchy.

The price mechanism or market incentives transmit relevant information to the actors in order to undertake the adjustments required (Haugland and Reve, 1994). The price will be determined by administrative procedures (Haugland and Reve, 1994). The term (market) incentives is used in this study in a broader context and is defined as the contractual agreements.

Contracts can play a vital role in enabling transactions that require investments in specific assets (Klein et al, 1978). They create a mutually agreed upon range of acceptable behaviors, backed by the option of redress to the legal system in the event of disputes (Masten, 1996). Contracts can specify the roles of each party, the expectations on performance, and a dispute resolution mechanism (Poppo and Zenger, 2002). Contracts have been presented as a manifestation of power that can be effective in certain circumstances, but more often promote conflict (Gaski, 1984) and defensive behavior (Hirschman, 1984).

According to Branconi and Loch (2004) eight key drivers should be addressed in contracts of complex procurement business deals, which are shown in figure 7.

![Figure 7: The eight key business levers in the contract. Source: Branconi and Loch (2004).](image-url)

The price mechanism or market incentives transmit relevant information to the actors in order to undertake the adjustments required. The price will be determined by administrative procedures. The governance mechanisms are handled by some of market incentives and some use of an administrative apparatus. In this way the hybrid mode can be described as partly market and partly hierarchy (Haugland and Reve, 1994). Authority includes power, decision rights, formal rules and regulations, standard operating procedures, etc. (Ness and Haugland, 2005).
2.4.2 Relational governance: trust

Governance mechanisms can be formal or informal. In the previous section the formal governance mechanisms are discussed. Informal governance mechanisms are relational, and it is based on trust or norms.

The relational approach offers a different and less explicit set of governance mechanisms to persuade suppliers to be more willing make transaction-specific investments. Zaheer and Venkatraman (1995) have defined relational governance as the interfirm exchanges that include significant relationship specific assets, combined with a high level of interorganizational trust. Trust in the relationship serves as a governance mechanism and complements market and hierarchy (Bradach and Eccles, 1989).

Buyer – supplier relationships with informal control are governed by social processes that promote norms of trust, solidarity and information exchange (Poppe and Zenger, 2002).

Trust is made up of two components (Doney and Cannon, 1997):

1. Credibility trust: the rational side of trust
2. Benevolent trust: the emotional side of trust

Credibility trust is viewed according to the calculative process: an organization calculates the costs and/or rewards of cheating (or not) in a particular transaction. When one partner delivers as he promised, it shows the ability to continue the exchange relationship. Or when one partner seems capable of generating some benefit for another partner in the future, the other partner may be more willing to continue to make exchanges and to stay in the relationship. With benevolent trust cooperation creates a situation of mutual goodwill. Partners will not take unexpected (non-cooperative) actions against each other. (Cullen et al, 2000).

Trust is used to describe the relations among groups of people rather than individual states. According to Lewis and Wigert (1985):

*Trust exists in a social system insofar as the members of that system act according to and are secure in the expected futures constituted by the presence of each other or their symbolic representations*

This means that trust used as a governance mechanism becomes a property of the relationship between the actors involved in the exchange process. In order to unlock the content of trust norms and personal relationships in exchange processes should be studied (Haugland and Reve, 1994). To understand the governance of interfirm transactions, it is crucial to reveal what kind of relationship the buyer and seller have established. Characteristics of the relation, such as relational investments and experience, are framing the specific governance mechanisms used (Haugland and Reve, 1994). When the buyer and seller develop experience, they learn about each other’s willingness to cooperate, their likelihood of opportunistic behavior and their devotion to continuing the relationship.
Trust can be viewed as a (Lewis and Weigert, 1985):

1. property of individuals
2. property of interpersonal relationships
3. kind of social organization

The first two approaches are psychological. For this research, trust is seen as a kind of social organization. Trust is a property of collective entities, and is used to describe the relations among groups of people rather than individual psychological states (Haugland and Reve, 1994).

According to Lewis and Weigert (1985) trust exists in a social system insofar as the members of that system act according to and are secure in the expected futures constituted by the presence of each other or their symbolic representations.

Macneil (1980) demonstrates that a key property of all buyer-seller relationships is the development of norms. Norms serve as rules and guidelines for ongoing exchange processes. Norms represent a principle of right action binding upon the members of a group and serving to guide, control, or regulate proper and acceptable behavior (Macneil, 1980). Trust as a governance mechanism requires focus on the relation itself (Heide and John, 1992).

The transaction cost economists have emphasized the importance of relational governance mechanisms in economic exchange (Poppo and Zenger, 2002). Relational governance mechanisms refer broadly to mechanisms based largely on trust and social identification (Martinez and Jarillo, 1989). They include establishing teams, tasks forces, and committees (Schrader, 1991); direct managerial contact through trips, meetings and even the transfer of managers (Martinez and Jarillo, 1989); mechanisms for shared decision making (Schrader, 1991) and formal systems for conflict resolution relying on two way communication and joint problem solving (Kale et al, 2000). In contrast to contractual governance mechanisms, the scope of these mechanisms is more open; they create no formal alternatives in the event of unresolved conflict; and the identity of parties (executives transferred, members of task forces) is critical (Hoetker and Mellewigt, 2004).

Relationship specific assets of either type could become an obstacle to the formation of an alliance, as neither party wants to expose itself to their inherent risks. Firms must therefore structure their relationship in order to mitigate these risks. Two common approaches to doing so in the context of alliances are the use of both formal contractual governance mechanisms and relational governance mechanisms (Poppo and Zenger, 2002). However Heide and John (1992) expected that in the early stages of a relationship the norms haven’t been fully developed. The possibility to control through relational mechanisms is therefore limited. In such cases they expect parties to focus mainly on formal mechanisms.
2.5 Effects of Governance Mechanisms

The concept of transaction cost economics (TCE) has emerged as a common framework for understanding how managers develop governance arrangements. The starting point of this theory is that managers align the governance features of inter-organizational relationships to match known exchange hazards, particularly those associated with specialized asset investments, difficult performance measurement, or uncertainty (Williamson, 1985, 1991). In reaction to exchange problems, managers may develop complex contracts that define remedies for expected contingencies or specify processes for resolving unforeseeable outcomes.

The degree to which the specificity present in a relationship is generated by physical assets or by knowledge assets is crucial for optimal configuration of controls. Contractual controls are more suitable for physical assets that are easily codifiable and transmitted. On the other hand, knowledge assets will be best suited to the use of relational governance mechanisms due to the inability to specify exact processes and outcomes in advance. The mismatch between the governance mechanism and the source of asset specificity can harm the performance of a relationship (Hoetker and Mellewigt, 2004). Relational governance mechanisms improve overall alliance performance to the degree that knowledge assets are involved, but actually impairs when property assets are involved. (Hoetker and Mellewigt, 2004).

Relational governance mechanisms play a critical role in helping firms exploit knowledge assets in alliances. When the only assets being governed are amenable to contractual mechanisms, e.g. physical assets, relational mechanisms may be unnecessarily burdensome. They may actually become counter-productive in the presence of extensive physical assets due to high costs and over-socialization (Hoetker and Mellewigt, 2004).

According to the agency theory (Eisenhardt, 1989) and the relational contract theory (Macneil, 1980), three important considerations for designing contracts and governance mechanisms are:

1. Measurability of outcomes
2. Programmability of tasks and
3. Need for continuous flexibility

It is expected that incentives to govern tasks with outcomes that are easy to measure. Authority should be most suitable in situations characterized by high degree of task programmability and for outcomes that are difficult to measure. Trust is expected to be used in situations characterized by a low degree of task programmability, a continuous need for flexibility and for outcomes that are difficult to measure (Olsen et al, 2005).

Notwithstanding that price, authority and trust are three independent governance mechanisms; Haugland and Reve (1994) find in their research that some specific combinations are more common than others. Stinchcombe (1985) documents how price and authority are combined. He argues that authority mechanisms are written into contracts.
The theory predicts that as asset specificity increases, market mechanisms are gradually replaced by hierarchical mechanisms; administrative procedures and control. With reference to a specific transaction with certain characteristics, it is, according to the theory, possible to determine what will be the most efficient governance structure (Haugland and Reve, 1994).

### 2.6 Complementary Effects of Governance Mechanisms

Haugland and Reve (1994) found that the three governance mechanisms price, authority and trust can be used in different combinations. Instead of looking at the market and hierarchy as “poles of a continuum”, governance mechanisms can be viewed as a vector combining various governance elements according to this study. Ferguson et al (2005) concluded that contractual and relational governance need to be considered as complementary mechanisms. However Ring and Van de Ven (1994) argued that there is a substitutive relationship between formal contracts and trust in situations of inter-firm cooperation, which is also found in the later study of Wuyts and Geyskens (2005) who conclude that transactional and relational mechanisms act as substitute forces.

Though, various other studies have emphasized the essential complementary characteristics of different governance mechanisms (Larson, 1992; Poppo and Zenger, 2002; Zucker, 1986). Multiple researchers found that the joint use of contractual and relational mechanisms generates more efficient outcome than the use of each of either in isolation (Klein-Woolthuis et al, 2005; North, 1990): relational and contractual governance complement each other (Poppo and Zenger, 2002; Hoetker and Mellewigt, 2004). Liu et al (2009) found that when transactional and relational mechanisms are used together, larger benefits will be achieved in terms of opportunism mitigation and better performance than when they are used separately. Each performs better when accompanied by the other, providing direct evidence for the theoretical logic underlying the complementary relationship between them (Poppo and Zenger, 2002). The mechanisms are however not interchangeable, meaning they are not substitutable. Each has its distinct limitations, making the optimal combination of governance mechanisms highly dependent on the content of the alliance (Hoetker and Mellewigt, 2004). For example whether the contract and contracting process is interpreted as a sign of distrust or as a written manifestation of commitment depends on relational assumptions, experience and intentions of all parties appear (Zheng et al, 2008).

The study of Yu et al (2006) concludes that calculative trust acts as a moderating factor in the relationship between formal governance mechanisms and transaction-specific investments. However, they also found that the length of a relationship has no significant effect on transaction-specific investments, and drives no moderating effect on the relationship between formal governance mechanisms and transaction specific investments. The study of Cai et al (2009) confirms that both legal contract and relational governance mechanisms are required for maintaining and promoting an effective buyer-supplier relationship.

Although, there is a reasonable body of evidence to support an integrative view of contractual and relational governance as complementary mechanisms, the impact of their inter-relationship is much less
well documented (Zheng et al, 2008). Many studies have indicated that the governance mechanisms will often be combined (Bradach and Eccles, 1989; Murry and Heide, 1998; Cannon et al, 2000). One important reason for arguing that different governance mechanisms should be combined is that a large number of governance challenges are prevalent in most inter-firm relationships, and relying on one single mechanism is therefore rarely found in practice (Bradach and Eccles, 1989). Bradach and Eccles (1989) argue that incentives, authority and trust are intimately intertwined, and that we should expect the co-existence of incentives, authority and trust. However, we still lack understanding about the specific ways in which governance mechanisms interact, and whether different mechanisms supplement or complement each other (Poppo and Zenger, 2002).

2.7 Expected Multiplier Effects of Governance Mechanisms

The complementary effect of governance mechanisms is the result of combined usage of governance mechanisms rather than the isolated usage. The previous section concluded that in general the combined usage of governance mechanisms impacts the results positively rather than the isolated usage. This section takes this one step further by addressing multiplier effects of governance mechanisms. A multiplier effect is the interplay of the governance mechanisms, meaning the effect of governance mechanisms on each other when used in combination, and how this interplay affects the outcomes.

Olsen et al (2005) show that there is a complex interplay between the specific uses of the different mechanisms, which are called a multiplier effect: “Proper use of one mechanism improves the use of other mechanisms, while inadequate use of one mechanism hampers the use of other mechanisms”.

In the study of Olsen et al (2005) two cases were compared based on three governance mechanisms. Case A scored positive on all these items, while case B scored negative. The results of the analysis of the results of both projects were accordingly: case A had better outcomes than anticipated, while B had bad results and was below expectations (the project was delayed and the costs exceeded). The study has illustrated a complex interplay between different governance mechanisms, and furthermore that combinations of mechanisms in some cases strengthen each other and in other cases weaken each other.

It appears from the discussed literature that trust plays an important role in governance mechanisms. In the beginning of a project the basis is already made for the rest of the process and the outcomes of the project. However, it is not proven that trust in all situations will facilitate the implementation of other mechanisms. The primary role of any governance mechanism at start up is to stimulate and enhance a common focus on joint goals. Trust can serve this role based on the article of Olsen et al (2005).

It is expected that the results from Olsen et al (2005) are widely applicable and that there is a multiplier effect when using multiple governance mechanisms. They claim that it is not sufficient to explain exchange performance by looking at each single governance mechanism; it is the mutual interplay between the mechanisms that is important for understanding exchange performance. Derived from the study of Olsen et al (2005) the following research model is used:
The different mechanisms and simultaneous usage will affect each other, and the project outcomes. It is expected that the interplay on each governance mechanism has a positive or negative effect on each other as well as on the project process and outcome. More specifically the following outcomes are expected:

- Low level of trust will lead to weaker incentives and authority, which combined will also affect the project outcomes in a more negative way. On the other hand, a low level of incentives will lead to lower authority and trust.
- A high level of trust will enhance the ability to stronger incentives (higher risks and rewards) and authority, which then also leads to a more positive project outcome.

In figure 9 these assumptions are visually presented.
The previous assumptions are supported by the findings of the research of Olsen et al (2005), where they conclude that a positive multiplier effect indicates that proper use of one mechanism, for example trust, not only pays off within its specific use, but also has positive effects on the use of incentives and authority. On the other hand, a negative multiplier effect has the opposite effects. Lack of, for example, authority may also hamper the use of incentives and trust.

Figure 9: Theoretical expectations
3. **RESEARCH METHODOLOGY**

The previous chapter discussed ‘what’ has been researched in this study. This chapter describes what choices have been made on ‘how’ to perform this research. After describing the selection of the research strategy and the procurement project to research, the choice for the data collection and analysis method is outlined. The final section of this chapter reflects the methodological quality of this research.

3.1 **RESEARCH STRATEGY**

To answer the research question exploratory research is required. Based on this study further hypothesis can be formulated. The answer to the specific research question requires focus on the complexity and context of the situation, which is not possible through surveys or quantitative research. Case study research allows the researcher to answer questions in an area which have not been thoroughly researched yet. Therefore, for this study the case study method is chosen. A case study approach enables conducting an in-depth analysis of specific interactions among the three mechanisms. This may reveal new knowledge on how governance mechanisms may be combined.

A primary distinction in designing case studies is between single- and multiple-case studies (Yin, 2009). Case studies allow generalizations and using multiple cases can lead to some form of replication (Noor, 2008). The choice for multiple cases is appropriate given that Yin (2009) argues that multiple-case studies should follow a replication, not sampling logic. This means that two or more cases should be included within the study precisely because the investigator predicts similar results (replication) will be found. If such replications are indeed found for several cases, you can have more confidence in the overall results. The development of consistent findings, over multiple cases can then be considered a very robust finding (Yin, 2009). Researching a number of organizations would improve the accuracy, validity and reliability of the results by capturing the holistic essence of the subject studied (Noor, 2008).

Although the evidence from multiple cases would improve the external validity of this research, it is chosen to limit this research to a single case study. According to Yin (2009) the investigation of the dynamic relation between trust and contract by its nature requires a longitudinal case study which is a rationale for doing a single-case study. Also Mintzberg (1979) asks what is wrong with a sample size of one and why should researchers apologize for them. However the case study research done by Dr. Haugland (Olsen et al, 2005) is taken as a base in order to compare the findings of this study with his results. The case study is done within the oil and gas industry like Haugland’s research concerning a complex procurement.

The following schematic overview in Figure 10 of case study research is used for execution. In this study only one case study is executed, the cross case analysis is done with the researched cases in the study of Olsen et al (2005). The phase of pilot case study is skipped in this research because the study of Olsen et al (2005) is used as a basis, and therefore the method of executing is considered already proven.
3.2 CASE SELECTION

The research questions were empirically explored within the Norwegian oil and gas industry to make it comparable with the results from Olsen et al (2005). Therefore, a case representing complex procurements was selected. The selection of the case was based on the following criteria:

- A project within the oil and gas industry
- concerning a complex procurement with several actors involved

The selected case is a procurement project for a very innovative construction pilot project in Norway. This project was a very complex procurement process involving multiple actors. This case will be compared to the results from the two cases described in the article of Olsen et al (2005). It will be a validation whether the hypotheses are supported as well on other cases in the industry, and whether the conclusions are supported in a broader context in this third case.
3.2.1 Background case

This section aims to give a broader background understanding of the selected case. More specific details about the case in relation to the research can be found in the next chapter.

Since the selected case still has a follow up at the time of the research, the name of the project is kept confidential and the results are anonimized. The case is a major construction project in the offshore oil and gas industry in Norway. The project took place in the FEED phase.

The project is classified as a complex procurement project due to the number of actors involved, high investment, long lead time and uncertainty. One of the key characteristics of the project is the high technological complexity. It is a very innovative project, meaning that there was a high level of uncertainty at the start of the project regarding expected outcomes. This complicated the procurement process as well, since it was not known yet what exactly would be procured (as that would be one of the outcomes of the design in the FEED phase).

Because of the innovative character of this project long term relationships/joint development and Intellectual Property rights play an important role.

The size of the pilot project is 2 billion NOK, and had a duration of 6 years (started in 2004 with the contracting strategy, the procurement was finished in 2010).

Given the fact that this case is a very complex procurement within the oil and gas industry, it was a suitable case for the study. According to Dr. Haugland (co-writer of the article of Olsen et al, 2005) this specific case would make an interesting study to apply the research framework since it is a very different case compared to the two which have been researched by his team. Finally, the results from the procurement process were not satisfactory, making it interesting to see what exactly went wrong and whether the governance mechanisms played a role in this, and specifically the potential multiplier effect of these mechanisms.

3.3 Context and data collection

One of the defining features of a case study is the collection of data through different methods or even different kind of data on the same phenomenon. The main feature is therefore the depth of and the focus on the research object (Ghauri and Gronhaug, 2002). Campbell and Fiske (1959) argued that to ensure validation one should use more than one method. The main advantage is that it can produce a more complete, holistic and contextual picture of the object under study.

Yin (2009) distinguishes six sources of evidence for conducting case studies: documents, archival records, interviews, direct observation, participant observation and physical artifacts. Since the selected case has taken place in the past the methods of direct and participant observation are excluded as method for this case study. The other sources of research each have strengths and weaknesses and are used as a way to complement each other and thus improving the validity of the research.
For most case studies (open ended) interviews are the most important source of evidence, while documents, archival records and physical artifacts are used to support and corroborate the evidence found by interviewing persons.

In this study the case had a duration of 6 years which makes the supporting evidence such as the documents and archival records very important: some key informants might not be available for interviews anymore or might be biased or have difficulties recalling certain events from the past.

The research is based on the following documents and archival records:

- Contracts with the integrator, the sub-contractors and second operator
- Project monthly progress reports
- Project strategy reports
- Project kick-off documentation

Interviews are conducted to get a better understanding of what is documented and the reasoning behind it. In-depth semi-structured interviews are done with:

- Key persons of the initial operator (engineer, technical managers and construction manager)
- Key persons of the second operator (supply chain manager, engineers, technical managers and project manager).
- Key person of the integrator (engineer)

Semi-structured interviews were chosen over structured interviews because it offers sufficient flexibility to approach different respondents differently while still covering the same areas of data collection (Noor, 2008).

In total ten in-depth semi-structured interviews are conducted within the internal operator, second operator and the integrator. Most of these interviews were held face to face, but a few were also conducted via phone because of geographical location of the interviewees. Cooperation was stimulated by reassuring the confidentiality of the research. The project appeared to be a very complex and unique one with sensitivities in many areas. In a complex project like this one it is difficult to find one person with a complete overview of the project. This made it necessary to interview multiple people during the research to collect all the needed information. Additionally very mixed results were found on particular questions, especially when comparing results between the different parties, where it seemed that each one “blamed the other”.

The people who were interviewed were all key people in the project working for the 3 different main stakeholders in the project. The same set of questions was asked to all the respondents. The respondents of the interviews included project managers, contract managers, technical managers and more hands-on (technical) employees who together gave the full spectrum of the project (on high level, and more down-to-earth day to day activities on the work floor).
3.4 Analysis

Interpreting and analyzing qualitative data might be one of the most difficult tasks while doing case study research. In qualitative research authenticity rather than reliability is the main issue (Ghauri and Gronhaug, 2002). In case study research, interweaving data collection and data analysis right from the first case/interview is the best policy (Miles and Huberman, 1994).

The collected data is sorted through coding and classifying the data (Ghauri and Gronhaug, 2002). This meant for example that the content of each of the contracts was categorized in a table which made it easy to compare and to have a clear overview of the key elements. The progress reports were processed into a timeline to understand the chronology of events, which also showed the key problems over time. During the entire research also the memoing technique was used. According to Babbie (2001) memoing is writing memos or notes to yourself and others involved in the project: elements of what is written during the analysis at least stimulates what is written in the final results and conclusions.

One of the challenges in case study research is the importance of human subject protection according to Yin (2009). The subjective effort of the researcher can contribute significantly in the pursuit of methodological objectivity. This contribution can only be positive when the researcher can find a right balance between involvement and distance, has an open mind and heart, has self-insight and is able to role taking (Maso and Smaling, 1998). Since the researcher of this study had no direct relation with the companies involved nor with the people who were interviewed the subjectivity was limited, and an open view could be maintained.

The questions which formed the base for the semi-structured interviews can be found in Appendix I. The following two chapters describe the results from the research and the conclusion.

3.5 Measurement

Each of the variables of the conceptual model are already described in chapter 2. This section describes primarily how these variables will be measured, but starts with a short definition of each of the variables.

- **Contract/incentives** refer to the market mode of exchange. Contract/incentives is measured by investigating to what extent market mechanisms determined the specific terms which the parties agreed upon when they entered into the exchange. The variable is measured in a broader context, including contract elements in general and incentives specifically.
- **Authority** refers to the hierarchical mode of exchange: reliance on administrative procedures and control, was measured by the extent to which one party solely had the ability to determine terms of trade, and to what extent standard operating procedures for supervision were implemented.
- **Trust** refers to social mode of exchange, measured by studying two relational norms and the importance of personal relationships (Bradach and Eccles, 1989).
- **Project outcomes** refer to the results of the project. The most common way to measure project success is though time (schedule), costs and quality (Munns and Bjeirmi, 1996; De Wit, 1988).
The basis is the available documents regarding the project, which should provide a basic understanding of the project regarding the variables. The documents provide most of the data regarding incentives, authority and project outcomes. The variable “trust” is measured through interviews, rather than the documentation. Furthermore the interviews are used to understand why certain outcomes occurred.

Overview of variables

The main focus of the interviews is to find whether multiplier/interplay effects exist between the governance mechanisms, and on the project outcomes. The questions are targeted to understand the relationship between the 4 variables, for example how the usage of the mechanism trust could have affected the mechanisms incentives and authority. Secondly questions are asked to understand how the combined governance mechanisms have influenced the project outcomes. On all the answers from the respondents is probed further to answer the “why” and “how come” of each variable score. Each of the respondents is asked about their opinion how the governance mechanisms have affected each other. The respondent is asked for example how the lack of authority influenced trust and incentives, and how this affected the project outcomes finally. Additionally everyone is asked how this could have led to

1. Contract/Incentives:
   a. Availability of a detailed scope of deliverables
   b. Realism and clarity in scope (achievable and understandable)
   c. Measurability of incentives (objective, clear)
   d. Reward potential
   e. Risk potential
   f. Contract elements

2. Authority:
   a. Clear responsibility for each party (and accountability)
   b. Formal/informal structure
   c. Steering group authority
   d. Administrative control

3. Trust:
   a. Previous cooperation experience
   b. Nationalities in project team
   c. Openness in communication
   d. Start-up program E.g. teambuilding, Work meetings
   e. Level of Integration

4. Project outcomes:
   a. Timely, within schedule
   b. Costs within budget
   c. Quality: Satisfaction with deliverable

5. Multiplier effect governance mechanism:
   a. Interplay between the governance mechanisms, and on the project outcomes.
different outcomes, for example if trust would have been high instead of low, how that would have affected the rest of the mechanisms.

Each of the 4 variables consists of sub-variables to measure the outcome, which are shown below. The total qualification of the variable was simplified into a score of high, low or neutral (or positive, negative or neutral). The specific questions can be found in appendix I. By dividing each variable in sub-variables and questions the meaning of the variables is clear to each respondent.

These variables and method of measuring are based on the research of Olsen et al (2005) in order to compare the results. An interview guide is used for each interview. Main objective is to understand the relation between each of the first 3 variables and how that influenced the fourth variable, project outcomes in order to understand the multiplier effect. Open questions are asked during the interview to gain more knowledge about the respondents’ opinion. Also hypothetical questions are asked to verify the answer, such as IF authority would have been high, would this have affected trust and incentives in a different way as it did now, and would the project outcomes have been different?

The interplay of the governance mechanisms, and the project outcomes is measured by a pair of governance mechanisms and their interdependencies, and the combined effect on the project outcomes, for example the combination of price/incentives and authority on project outcomes, or authority and trust on project outcomes. By looking at each of the relations between the two governance mechanisms and the project outcomes a total overview of the governance mechanisms and their multiplier effect on the project outcomes is achieved.
4. **RESULTS**

The first section describes the general background and insights of the case. The following sections present the outcomes of each of the variables of this study. Then the case analysis is presented concluding with the interplay (multiplier) effect of the governance mechanisms.

4.1 **THE CASE IN GENERAL**

General background information about the case can be found in chapter 3.2.

The next table shows the main characteristics of the project, and will be outlined more detailed in the next sections.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Case</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose</strong></td>
<td>Qualification of components for major construction project in the offshore industry</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>Initially estimated 850 million NOK</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>6 years</td>
</tr>
<tr>
<td><strong>Contract form</strong></td>
<td>EPCI contract (reimbursable)</td>
</tr>
<tr>
<td><strong>Organizational form</strong></td>
<td>Co-location with main contractor/integrator</td>
</tr>
<tr>
<td><strong>Number of main partners</strong></td>
<td>1 integrator, 5 subcontractors</td>
</tr>
<tr>
<td><strong>End result</strong></td>
<td>• Cost increased to 2 billion NOK</td>
</tr>
<tr>
<td></td>
<td>• Delayed</td>
</tr>
<tr>
<td></td>
<td>• Started as strongly integrated team, but as evolved to become more separated teams</td>
</tr>
<tr>
<td></td>
<td>• Technical qualified deliverable</td>
</tr>
</tbody>
</table>

The project of the case study was executed, like most projects in the oil and gas industry, by an operator, an integrator and the subcontractors. Different in this project was that it was taken over by another operator after a few years. The second operator was already involved in the project in an observing role, and later having full responsibility. The execution roles remained the same throughout the entire project. The diagrams in figure 11 visualize the different stakeholders involved in the project.
Figure 11: Main stakeholders in project - change of responsibilities

Figure 11 shows the shift in responsibilities throughout the project. It doesn’t show the interfaces. Due to several reasons which will become clear in the next sections, direct contact existed between operator A and the sub-contractors during the project about the deliverables and technical aspects as well as on project control.

The involvement of many sub contractors in the organization was another complexity: A long supply chain was in place with sub-sub contractors and even further down the chain. Additionally parties with multiple roles were involved, for example the integrator was at the same time a subcontractor for specific deliverables. The diagram in figure 12 visualizes on high level the organizational chart with the contractors.

Figure 12: Overview involved parties

The next 4 sections present the outcomes of the case study for each of the variables: contract/incentives, authority, trust and project outcomes.
4.2 CONTRACT & INCENTIVES

The variable “incentives” was measured according to a set of sub-variables which are individually discussed in the next sub paragraphs.

In essence can be said that:

- Incentives were non-existing, neither were penalties.
- The contract included most of the contract elements described by Branconi and Loch (1998).
  However from an administrative perspective the contract wasn’t complete.
- The control system wasn’t specified enough.

4.2.1 Contract elements

With each of the parties involved was a contract. There were three types of contracts:

1. Between the two operators
2. Between the operator and the integrator
3. Between the integrator and the subcontractors.

1: The contract between the two operators (1 supervising and 1 operating) was just a cooperation agreement consisting of only two pages without further specifications. This contract didn’t include the eight elements of Branconi and Loch (1998) (see also chapter 2 for further explanation of the eight elements).

2 and 3: Each of the contracts was made according to the same contract model with similar content. The contract with the integrator was fully reimbursable, and most of the contracts with the subcontractors were as well. Reason for the choice of reimbursable contracts was due to the technology development nature of the project. These contracts consisted most of the 8 elements that were defined by Branconi and Loch (1998), and are more described in the next table (see also figure 7).
Table 2: Contract elements result case

<table>
<thead>
<tr>
<th>Contract elements</th>
<th>Case results</th>
<th>Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Specification</td>
<td>The specification was described in the contract through the technical requirements section as well as in the section about contractor deliverables. Something that was not as clearly described were the specifications of control systems (such as reporting on deviations, time, costs etc)</td>
<td>Not enough</td>
</tr>
<tr>
<td>2. Price</td>
<td>The contract included a price breakdown.</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Schedule</td>
<td>Each of the contracts included a schedule with the main deliverables.</td>
<td>Yes</td>
</tr>
<tr>
<td>4. Payment terms</td>
<td>Payment terms were described in the main contract, as well as the invoicing procedure.</td>
<td></td>
</tr>
<tr>
<td>5. Warranties</td>
<td>All the parties are insured. There is no specific mentioning of warranties, probably due to the nature of the project which was technology development.</td>
<td>Yes</td>
</tr>
<tr>
<td>6. Penalties</td>
<td>There were no penalties for non-performance, it was a fully reimbursable contract</td>
<td>No</td>
</tr>
<tr>
<td>7. Limitation of liability</td>
<td>Limitation of liability in terms of maximum amount of money is enclosed in the contract, with specification of particular exceptions.</td>
<td>Yes</td>
</tr>
<tr>
<td>8. Mutual assurance of fulfillment</td>
<td>Mutual assurance of fulfillment with securities by having guarantees in place</td>
<td>Yes</td>
</tr>
</tbody>
</table>

All the contracts were very extensive and standardized, but it also seemed that it was re-used from previous efforts without rechecking details. There were mistakes for example in referring to the wrong chapters. Later, in section 4.3, it shows as well that there is an issue with administrative control, which these contracts were probably a first indication of. In addition, it would have been helpful for these kinds of large contracts to have a short overview/summary of the content for each contract in order to keep better overview.

4.2.2 Detailed scope of deliverables

In each of the contracts (with the integrator and with the subcontractors) the deliverables were clearly described. The contracts were described very detailed on a technical level.

4.2.3 Realism and clarity in scope

Since the project was a technology development project the functionality and purpose of the deliverables were clear, yet the technology behind it was to be developed. Even though the deliverables
were clearly described it was not in all cases understood and potentially less achievable for certain subcontractors. Especially for some of the subcontractors it was a new expertise or a new industry, meaning that for some of them the deliverables were not as clear, which resulted in delays and cost increase.

4.2.4 Measurability of incentives

Initially, the contracts didn’t include any incentives (or penalties). At that time there was no incentive for contractors to meet deadlines, or to deliver the best technology. Only a year ago incentives were included in the contract with the integrator. Since it was an amendment to the contract, no penalties could be negotiated for this contract. The integrator passed some of these incentives over to his subcontractors and included incentives in those contracts as well.

Two types of incentives were included:

1. Cost driven: meaning that if the company stayed below the target costs, a percentage of the difference between actual costs and target was awarded.
2. Milestone driven: meaning that the company delivered certain elements at specific times.

4.2.5 Reward potential

Since the incentives were only included into the contract during the project, it was possible to make a comparison of results before and after the incentives were in place.

After implementing incentives, it appeared that the companies were more driven to meet the targets, and incentives. The people in the companies were talking about it and motivated to meet the incentives. It seemed as there were no further slippages of time and cost.

One problem that occurred from implementing the incentives was that if the cost target was already passed, there was no more incentive to worry about additional costs by the supplier. For example, if the cost target was 1mln NOK, and the supplier already spent this amount, it didn’t matter anymore whether he would spend 1.2 mln NOK or 1.4 mln NOK, the supplier wouldn’t receive any incentive anymore anyway.

4.2.6 Risk potential

No penalties were included into the contract, and since it is a fully reimbursable contract it seems a very low risk project for the integrator and the subcontractors. The risk lies with the operator. There only was a 12.000 Euro penalty for changing key employees during the project.
Since it is a technology development project, the risk of the project itself is limited. The main objective was to have a qualified technology by a certain time. If this was not met, the operator would go ahead with an alternative proven technology (which was more expensive).

### 4.2.7 Summary

In the next table an overview is given for the variable incentives/contract, summarizing the previous sections. It is based on the period that no incentives were in place yet, because that was the case for most of the project.

**Table 3: Summary variable "contract/incentives"**

<table>
<thead>
<tr>
<th></th>
<th>Operators</th>
<th>Operator – Integrator</th>
<th>Integrator - Subcontractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract elements</td>
<td>No</td>
<td>Not enough</td>
<td>Not enough</td>
</tr>
<tr>
<td>Detailed scope of deliverables</td>
<td>No</td>
<td>Yes</td>
<td>Not enough</td>
</tr>
<tr>
<td>Realism and clarity in scope</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Measurability of incentives</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Reward potential</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Risk Potential</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

The variable incentives scores thus negative.

### 4.3 Authority

The variable “authority” was measured according to a set of sub-variables which are individually discussed in the next sub paragraphs.

In essence can be said that:

- Responsibility was one of the key problems in the project.
- Authority in general was low in the project
4.3.1 Responsibility

Responsibility was one of the key problems in the project. The responsibilities can be looked at on the different levels:

- Between the two operators: no hierarchy existed, since it was only based on a cooperation agreement. The full responsibility lied with the initial operator, and this was clear to all parties. However is mentioned in the previous section as well, it was not clear always in meetings for example who was doing what.

- Between the operator and the integrator: in general the responsibilities were clear. In practice however both were so much integrated that it was not always clear who was actually responsible for what.

- Between the integrator and the sub-contractors: the responsibilities have not been clear. It was not clear where the scope ended and begun for the next party. For example this was a problem with the interfaces between the several subcontractors.

A key problem in the project was interface management. It was not clear where certain responsibilities of parties ended, and where the others started. The lack of an interface manager proved this too, and this problem was specifically mentioned by all of the respondents.

4.3.2 Formal/informal structure

Based on the outcomes from the interviews it appeared that most people considered the structure to be formal between the operators. On the other hand it also appeared that it was unclear what this structure then exactly was, probably due to a lack of communication. There was un-clarity about who was doing what, for example in some of the meetings it wasn’t clear to all the participants who each of the other participants was and the purpose of their attendance. One of the respondents of the operator said: “Every week we have a new team of people visiting the site and attending the meeting and it is absolutely unclear what all these people are doing there and what the purpose of their visit is. Even worse is when they don’t agree among each other during the meetings”.

An informal structure existed between the operator and integrator. This was demonstrated by the possibility of having ad-hoc meetings when needed. Additionally little documentation existed of reviews of the results at the subcontractors /integrator.

4.3.3 Steering group authority

A Management Committee was in place and the responsibilities were described in the project documentation. However in reality most of the people didn’t know what was the role of the steering group or their actual impact on the project.
The Management Committee would meet on a regular basis and was mainly in place as a high level communication forum. It mainly set the high level objectives and strategy. Each of the partners had one member and one deputy member appointed in the committee. The chairman was appointed by the operator.

### 4.3.4 Administrative control

The project had a monthly reporting system. Usually this was an overview on PowerPoint slides from the integrator to the operator with the highlights of the project. Over time different formats were used. Key elements in these overviews were:

- Costs
- Schedule
- Safety (HSE)
- Quality
- Risk

The overview showed for example the cost increases and the delays in timing. However it didn’t show who was responsible for the deviations (which subcontractor), nor the expected further impact of this on the project. Also, since there were many schedule delays in first instance the reports didn’t show clearly how the costs were affected by this (for example, because of the delay it was possible that everything was still within budget, but in reality it could have been above budget if the costs would have been adjusted to the real-time schedule). Another item missing in these reports was how deviations to costs or schedule were to be mitigated.

Based on the above the reporting in the project was considered to be not good enough according to the respondents.

### 4.3.5 Summary

In the following table an overview is given for the variable authority, which was described in more detail in the previous sections.

**Table 4: Overview variable Authority**

<table>
<thead>
<tr>
<th>Authority</th>
<th>Operators</th>
<th>Operator – Integrator</th>
<th>Integrator – Subcontractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear responsibility</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Formal /informal structure</td>
<td>Informal</td>
<td>Informal</td>
<td>Unknown</td>
</tr>
<tr>
<td>Steering Group authority</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Administrative control</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Variable | Negative | Negative | Negative
The variable authority scores thus negative.

4.4 Trust

The variable “trust” was measured according to a set of sub-variables which are individually discussed in the next sub sections.

In essence can be said that the technical trust is high; all parties seem to be confident about the capabilities and expertise of the other party.

4.4.1 Previous cooperation experience

The industry is a “small world”, so the parties have all worked together before in different occasions. On an individual level people may have not worked together before. In some instances people had switched careers and company, and used to work for one of the other parties earlier in their career. On the other hand, some of the subcontractors were completely new in the industry, hence no previous cooperation experience with the other parties.

4.4.2 Nationalities

Many different nationalities were present in the project, particularly among the subcontractors. The main nationalities were British, Italian, French, Norwegian and Dutch. The main nationality in the teams of the integrator and initial operator was Norwegian.

In general respondents had a positive attitude towards working with different nationalities. A few issues were identified:

- Working language is English; not everyone is used to working in English and especially with complex technological discussions it could be more difficult to communicate in English than in their native tongue. Using a second language, English, occasionally led to misunderstandings.
- Different perception on quality and working processes. For example in certain countries it is more common to work with lump sum contracts including penalties and rewards. Having reimbursable contracts didn’t always work in these countries, for example because priority was given to the other projects with rewards and penalties, which resulted in giving this project second priority.
4.4.3 Openness in communication

No particulars regarding openness in communication were mentioned, and it appeared that requested information was usually easily obtained.

As a few of the respondents said “obviously in a commercial project 100% openness is hard to achieve, so also in this project that was probably not the case”. However no specifics were mentioned by the respondents other than occasional long duration of obtaining the requested information.

Between the two operators the respondents indicated there was a little less openness in communication. One of the respondents illustrated this by saying: “If we give them more information they come back with even more questions.”

4.4.4 Start-up program

None of the respondents had worked long enough in the project to have participated in the kick off meetings of the project. However, the respondents indicated that with each of the contractors of the big packages a kick off meeting was held.

Several team building events between the initial operator and integrator have taken place. Very little teambuilding activities including the new operator have taken place.

4.4.5 Integration

There was a very high integration between the parties involved. A shared location existed with the operator(s) and integrator. It made it very easy to be in touch with the different team members. Even during the interview it was sometimes not obvious whether the interviewer was talking with the operator or integrator as they seemed really one party.

The second operator seemed less integrated with the integrator. While visiting the office for the interviews there was no obvious presence of the second operator.

During the project the staff of the integrator has travelled much to visit the subcontractors on site throughout Europe, but the integration could have been higher. Towards the end of the project some of the employees have moved to a location closer to the subcontractors.
4.4.6 Summary

In the following table an overview is given for the variable trust, which was described in more detail in the previous sections.

Table 5: Overview variable Trust

<table>
<thead>
<tr>
<th>Trust between</th>
<th>Operator 1 – Operator 2</th>
<th>Operator – Integrator</th>
<th>Integrator -Subcontractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous cooperation experience</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Nationalities</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Problems</td>
</tr>
<tr>
<td>Openness in communication</td>
<td>Neutral</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Start up program</td>
<td>Not enough</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Integration</td>
<td>Not enough</td>
<td>Yes</td>
<td>Not enough</td>
</tr>
</tbody>
</table>

Variable Trust: Negative, Positive, Neutral

The score for trust is not the same for each party as the table before shows. The trust between the operators appears to be low, while the trust is high between the operator and the integrator.

4.5 PROJECT OUTCOMES

4.5.1 Cost

This project had many problems with cost overruns. The project was more than double the costs which were estimated in the start. Since it was a fully reimbursable contract it was very clear where the money was spent.

Several reasons were given for the cost increase:

- It was a technology development project, which meant that in the start of the project it was yet that clear what was going to be done and therefore non-accurate estimates have been given.
- There was a lack of cost control, and the system in place was not adequate.
- No incentives existed for the integrator or subcontractors to stay within cost limits.

When the incentives were put in place, it improved the costs.

4.5.2 Time

There were many schedule delays; 60-90% of the deliverables were delayed. This often caused a chain-reaction; due to late delivery of certain elements, other activities were also delayed. Another
characteristic of this project was the long supply chain with many sub-sub vendors. If something in the beginning of the chain goes wrong, it is noticed all the way up the chain.

A few reasons behind the delays are:

- The project was technologically very complex, and for some of the subcontractors a new field of expertise. Therefore they had difficulties delivering the agreed deliverables.
- Not enough resources were on the project. This was also caused by the lack of incentives; if a company could earn rewards on a different project it is logical to use your resources for that project instead.
- There was no planning manager on the side of the integrator.
- There was not a good time control system. The reports for example on the time schedule showed delays, but it didn’t show what impact it would have on the rest of the planning (inter-linkages) nor who was responsible.
- From the beginning there has been not enough focus on the planning, because all the focus was on the technology development.
- No penalties existed for not delivering on time.

One year ago incentives were included into the contract with the integrator, and subsequently with the subcontractors. After including incentives into the contract the time line hasn’t improved; it didn’t improve the delayed deliverables of the project (but also didn’t lead to further slippage of time). This is mainly caused by the nature of the project; it is a R&D project and therefore it is difficult to speed up. However it did shift the focus of the companies to the elements that were rewarded.

### 4.5.3 Quality

The quality of the project was certainly one of the most important aspects of the project, meaning that much of the focus was here. Few of the respondents have indicated that instead of focusing on costs or time, much focus was on the technical capabilities. This was shown for example in many meetings where most of the time was spent on technical issues rather than on project management issues.

Despite the “usual” problems during a project about quality and the interventions needed, the end result had the quality level as agreed.

### 4.5.4 Summary

In table 6 an overview is given for the variable project outcomes, which was described in more detail in the previous sections.
Table 6: Overview variable project outcomes

<table>
<thead>
<tr>
<th>Project Outcomes</th>
<th>Operator - Integrator</th>
<th>Integrator –Subcontractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Time</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Quality</td>
<td>Positive</td>
<td>Positive</td>
</tr>
</tbody>
</table>

| Variable Project Outcomes | Negative | Negative |

The results for project outcomes were negative.

4.6 Case analysis

The previous sections have described in detail each of the variables with respect to the three governance mechanisms and the project outcomes of the case study. In this section the case will be further analyzed with a special focus on the interplay between the incentives, authority and trust, and how the interplay may contribute positively or negatively to the project outcomes.

The variables Authority and Incentives/contract have scored negative. The variable trust depended on the party (operator, integrator and subcontractor), and ranged from positive to negative. The project outcomes for costs and time were negative as well. In the table in chapter 5 a complete overview can be found.

The main problems in the project (which resulted in cost increases and schedule delays) seemed:

- Not providing adequate documentation, e.g. the monthly reports were not easy to read and lacked particular information, which made it difficult to manage.
- Not having adequate control systems in place, such as procedures for cost control, time etc.
- Due to lack of experience/knowledge of a few subcontractors, there was too much focus on technical issues, and less on project management.
- Un-clarity of responsibilities and roles of the different parties, and lack of good interface management.
- Having a reimbursable contract and no incentives gave no incentive for better achievements.

4.6.1 The role of incentives and contract

The incentive structure was a fully reimbursable contract. The operator and the integrator had much previous cooperation experience and were already highly integrated with each other. The contract was seen as an intention of a joint effort to deliver the required technology. However, the fact that the contract included no additional rewards if the parties achieved positive outcomes and contained a very limited penalties, resulted in low motivation to keep the costs within budget and to keep within time
limits. The following statement from a respondent illustrates the problem of having a reimbursable contract without incentives: “The contract we had between the operator and the integrator was a suicide contract”. On the other hand, because of the reimbursable contract everything was very transparent.

The lack of incentives with the contractors made that the contractors sometimes set different priorities with their resource allocation. At some of the subcontractors it was seen that when resources were needed on another project which provided higher incentives, resources were moved to that project leaving this project with shortage of resources which obviously impacted the progress of the project. The lack of rewards was mentioned as one of the problems of not having positive project outcomes.

The fact that the level of trust between the operator and integrator was high, may have been one of the reasons why the parties were unable to formulate a better incentive scheme and relied on common goals and objectives. However during the course of the project the trust level has lowered because of the lack of incentives and having a reimbursable contract. One of the respondents at the operator said: “We were afraid to ask for specific tasks to be executed as it would increase the costs. Every item we asked for, would be written and paid for.”

The classical recommendation in project management literature is to use cost reimbursable contracts when project uncertainty is high (Branconi and Loch, 2004), which is often the case in the FEED phase. This approach leaves all responsibility to the client, while the contractor has no incentive to be innovative and contribute to the solution (Branconi and Loch, 2004). Under high uncertainty, the parties are better advised to get interest alignment by sharing ownership of the project (Branconi and Loch, 2004).

### 4.6.2 The role of authority

A steering committee was in place. However, it seemed as it didn’t influence the project much and its existence was barely noticed by the project members. One of the respondents at the operator said: “I think an improvement for the project would have been not to have a steering committee at all. It was not clear what it was doing, and was merely a communication platform. It surely was a waste of time.”

The high level of trust between the integrator and the operator also influenced authority. The operator and integrator were so much integrated there was a lack of control; formal procedures didn’t exist much and no power was executed. The high level of trust also justified the lack of incentives. The respondents said that the high level of trust made it ok not to have incentives, because of the common goals and interests.

Not having a contract in place between the operators, but only a cooperation agreement, made the level of authority also low. The second operator claimed to be unable to use any authority since there was no contract in place allowing them to do so. This in turn also resulted in a low level of trust between the operators because there were no adequate procedures or control systems in place. The second operator felt they had no control about what was going on and saw the negative project outcomes. The initial
operator on the other hand felt as if they were only being checked. The following statement at the initial operator illustrates this: “We avoided giving too much information, as this would lead to even more questions”.

### 4.6.3 The role of trust

The level of trust between the parties was high when the parties entered the cooperation agreement. The parties had already been working together before and on other projects. The parties were even located in the same building, being much integrated.

The parties already trust each other before the agreement was signed. This seemed to be important for the process of defining incentives and deciding upon the use of authority. Trust had a relational character.

### 4.6.4 Interplay of governance mechanisms and project outcomes

Incentives, authority and trust play important roles in the case and the use of these governance mechanisms influenced the final project outcomes.

In chapter 2 the expected outcomes were described on the interplay between the governance mechanisms and project outcomes. The results from the research show actually the opposites as what was expected for the variable trust on the other variables.

In the case appeared to be a high trust level, low score on incentives/contract and low authority. In general the project outcomes were considered to be negative.
- If the trust level is high, it appeared that there was less need for incentives or contract which is what happened between the operator and integrator. The same applied for authority. However this together had a negative effect on the project outcomes in the case study.
- When the trust level is low, there is a higher need for incentives or contracts, and more authority. This has a positive effect on the project outcomes.

![Diagram of Authority, Incentives/Contract, Trust, and Project Outcomes]

Figure 14: Results research: multiplier effect Authority on other governance mechanisms and project outcomes

- When Authority is low this has a negative effect on incentives and contract. It appears with low authority less effort is put into the contract as well, or in setting incentives. Most of it is based on trust and the relationship. However if authority is low, trust will also become lower because there is no control system in place which verifies process and outcomes for example and eventually appeared to be leading to lower trust.
- Low authority, no incentives, and lower trust have a negative effect on the project outcomes.

Other relations were not proven in the research. Either it appeared that contradicting relations were mentioned by respondents, no clear cut answers were given, or no relation was mentioned at all. Therefore the rest of the possible relations are not presented here.

The next chapter will discuss the outcomes of the research and compares it with the outcomes of previous research and the theoretical expectation.
5. DISCUSSION, CONCLUSION AND RECOMMENDATION

The first section discusses the outcomes of the research and compares it with the outcomes of previous research and the theoretical expectation. This is followed by the conclusions. The chapter ends with a recommendation for business and further research.

5.1 DISCUSSION

The importance of understanding the interplay of different governance mechanisms and the project outcomes were proven by the analysis and results of this case. Olsen et al (2005) already found that if the effects of one single mechanism are isolated, our understanding will also be limited. They found that incentives, authority and trust are linked to each other in specific ways, which they called multiplier effects. These multiplier effects can be either positive or negative. They give an example by stating that a positive multiplier effect indicates that the proper use of one mechanism, for example trust, not only pays off within its specific use, but also has positive effects on the use of incentives and authority. On the other hand, a negative multiplier effect has the opposite effects. For example the lack of authority may also hamper the use of incentives and trust. Liu et al (2009) found that when both contracts and trust are used better performance was achieved than when each was used separately. In their research it appeared that greater benefits were achieved in terms of opportunism mitigation and performance enhancement than when the mechanisms were used separately.

When comparing the empirical findings (chapter 4.6.4) with the theoretical expectations (chapter 2.7) it appears that the results are contradicting the expectations. Since still very limited research has been done regarding the interplay effects of governance mechanisms, the theoretical expectations were largely based on the findings of Olsen et al (2005). The next table below presents an overview of the results of this case study, and the results of the two case studies conducted by Olsen et al (2005).

<table>
<thead>
<tr>
<th>Table 7: Roles of incentives, authority and trust of 3 case studies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contract</strong></td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
</tr>
<tr>
<td><strong>Cost</strong></td>
</tr>
<tr>
<td><strong>Incentives</strong></td>
</tr>
<tr>
<td>Availability of a detailed scope of deliverables</td>
</tr>
<tr>
<td>Realism in scope</td>
</tr>
<tr>
<td>Reward potential</td>
</tr>
<tr>
<td>Risk potential</td>
</tr>
<tr>
<td>Contract elements</td>
</tr>
</tbody>
</table>
In general when comparing the empirical results of the cases it seems that the case of this research (Case C) and Case B of Olsen et al (2005) have similar characteristics. Case C and case B both characterized lower levels of all three mechanisms, while Case A (Olsen et al, 2005) represents a situation where all three mechanisms scored high.

Both Case A and Case C had a high level of trust between the parties, while the trust level in Case B scored much lower. However in Case A trust enhanced the parties’ ability to use incentives and authority. Case C demonstrated that high trust resulted in a lower use of incentives and authority. As opposed to Case A, in Case C the level of trust decreased as the parties cooperated, mostly due to the negative project outcomes. The general opinion of respondents in this case study (Case C) was that a lower level of trust would have made it easier to implement authority and incentives in the beginning, while Olsen et al (2005) claim the opposite. Caniëls and Gelderman (2010) found that high administrative control had a negative effect on relational norms, this study proved the adverse effect.

Possible reasons for the differences in the results for the researches might be because of different characteristics of the projects. This project (Case C) had many sensitivities (for example the change of operator during the project), and therefore not information was openly shared. Another reason could be the duration of the project which was much longer than the ones studied by Olsen et al (2005). Finally,
an important reason could be the main character of the project which was technology development, merely than system delivery as was the case in the two cases of Olsen et al (2005).

Case B showed that a low level of trust made it difficult to implement incentives promoting common goals. The lack of appropriate incentives resulted in a rather weak authority structure. This also was shown in Case C where the non existence of incentives also resulted in a low authority structure. In both cases it showed that the effects emerged to incentives and authority. Moreover, the low level of authority had further adverse effects on incentives and trust as the parties cooperated in the project. This is a common result from both this research and the research of Olsen et al (2005).

Liu et al (2009) found that a contract improves the relationship performance. In this study the results indicate the adverse too, meaning that a low score on contract/incentives affected the relationship (trust) negatively, suggesting that if there would be a high score on contract/incentives the relationship performance would have been higher.

Olsen et al (2005) carefully suggested that trust might facilitate the implementation of the other mechanisms. They state that trust can serve the important role in the beginning of a project to enhance a common focus on joint goals. From a project management perspective trust is already seen as an important factor to enhance the project outcomes and reduce opportunism (Pinto et al, 2009). Caniëls and Gelderman (2010) found that trust (relational norms) is the most powerful mechanism against opportunism. Also, this study found that trust plays an important role on implementing the rest of the governance mechanisms, and effects the application of the other mechanisms.

5.2 Conclusion

Governance mechanisms are used as safeguard measures to influence the exchange partner. Three types of governance mechanisms are indicated: contract/incentives, authority and trust. The isolated application of these governance mechanisms is not representative in real life and the mechanisms usually exist in combination. The purpose of this research is to better understand governance mechanisms for handling complex procurements. The problem statement is to understand the interplay of different governance mechanisms in complex procurement projects.

The empirical findings of this research broaden the knowledge about the interaction of different governance mechanisms. The interplay between the mechanisms indicates that different mechanisms affect each other. Different governance mechanisms are thus not only complementary, but they can also function as facilitators for each other.

Each of the research questions formulated in chapter 1 has been answered in the previous chapters. In short each of the questions and answers will be addressed in this section.
5.2.1 Effects of governance mechanisms

Governance mechanisms are used for exchange processes. Much research has been conducted about the effects of governance mechanisms. The results indicate that the governance mechanisms (trust and contractual governance) significantly affect the conditions that facilitate inter-organizational creativity (resources, motivation, and management practices) in a buyer–seller relationship. It gives a higher satisfaction on exchange performance.

5.2.2 Complementary effect of using multiple governance mechanisms

Researchers tend to agree that there is a complementary effect when using multiple governance mechanisms. Ferguson et al (2005) confirm that contractual and relational governance need to be considered as complementary mechanisms. Poppo and Zenger (2002) found the following effects of the complement usage of governance mechanisms:

- A positive effect exists between relational and formal governance mechanisms on each other
- Relational governance and contractual complexity appear to function as complements in influencing satisfaction with exchange performance (satisfaction with the cost and quality)
- Relational governance complements adaptive limits (such as the intent of mutuality, bilateralism, and continuance when conflict arises) of contracts by fostering continuance of the exchange and entrusting both parties with mutually agreeable outcomes.

Poppo and Zenger (2002) claim that since both types of governance mechanisms have different origins, they serve a different functionality. Because of this it cannot be viewed as substitution but they are complimentary, they have distinct roles in promoting exchange performance.

5.2.3 Interplay effect of governance mechanisms

Using governance mechanisms as complements rather than substitutes, raises the next question: do interplay effects exist between the different governance mechanisms, and whether this effect has a multiplier effect on the project outcomes.

The research question formulated in the first chapter is: What is the interplay of different governance mechanisms in complex procurement projects?

This case study has confirmed that interplay effects exist between the governance mechanisms. Different governance mechanisms are mutually dependent, and they affect each other. This is in line with the research of Poppo and Zenger (2002) where they found that contract complexity indirectly increases relational governance, which in turn increases exchange performance. As well higher relational governance affects contractual complexity positively, which in turn also increases the exchange performance. Each performs better when accompanied by the other. Also Olsen et al (2005) found an interplay effect between the governance mechanisms. However the actual interplay effects from this
research differ from the results found by Olsen et al (2005) in their research. These differences are described in the previous section, chapter 5.1.

Interplay effects:
- High trust level has a negative effect on contract/incentives and on authority. This resulted in a negative effect on the project outcomes, similarly vice versa.
- Low authority has a negative effect on contract/incentives and on trust. This resulted in a negative effect on the project outcomes.

This research proves as well as others before, that the governance mechanisms affect each other and the project outcomes. Therefore it is a managerial challenge to develop a productive rather than a counter-productive interplay.

5.3 Recommendation for Business

From a managerial perspective the knowledge that governance mechanisms also affect each other requires strategies in advance on how to use the governance mechanisms to have optimal results, rather than applying those in isolation. Liu et al (2009) suggest that the importance of concurrently and interactively employing both transactional and relational mechanisms together in order to effectively govern buyer–supplier relationships. Before the project starts each party should discuss the importance of each of the governance mechanisms and come to an aligned plan on which and how to implement governance mechanisms. The buyers (and partners) and suppliers should be committed to designing and executing the most optimal governance system.

One of the main conclusions was the importance of trust and relational governance mechanisms. Companies are searching for more competitive advantages in the marketplace, it becomes more and more important to build good relationships with suppliers and partners. Hence managers should be focused in particular on this aspect and should aim to develop an effective relationship with their partners and suppliers.

The classical recommendation in project management literature is to use cost reimbursable contracts when project uncertainty is high (Branconi and Loch, 2004), which is often the case in the FEED phase. This approach leaves all responsibility to the client, while the contractor has no incentive to be innovative and contribute to the solution (Branconi and Loch, 2004). Under high uncertainty, the parties are better advised to get interest alignment by sharing ownership of the project (Branconi and Loch, 2004). The case study used a reimbursable contract as was advised in the project literature. However the lack of incentives should have been mitigated by a shared interest to achieve the objectives.

5.4 Recommendation for Further Study

The research methodology is a case study to be able to broaden knowledge in this area. The execution of the research was according the described process and well executed. Since the interviewee was not
connected to either of the parties involved, an objective view could be maintained. One of the aspects that appeared challenging was that the project was so complex and extensive, that only very few people had a complete overview of what has happened, if even. Also many people had changed roles during the project time, so there were only very few left who were there since the start. Some of the questions were difficult to answer by respondents not in a project management position, since they lacked the complete overview. The total respondents together, when combining all the answers, gave a complete overview of the project. The results might have been more reliable or complete when also results were obtained from the subcontractors.

Another limitation of this research is that it was an exploratory study and although established literature set the research in a theoretical framework, there was no formal hypothesis development or testing.

As always qualitative research is much dependent on the interpretations of the researcher. The research was aimed to be as objective as possible with a questionnaire and interviewing multiple people using the same questions. By using multiple data sources, such as the monthly review documents, reliability was improved as well. And the advantage of probing on answers during the interviews gave a better understanding of why certain things happened and thus the relation between events and variables.

Concerning external validity to generalize the results it should be noted that since only one case was studied, the results should be interpreted with cautiousness. The results cannot be generalized to other complex procurement projects. Especially since the results from this research differ from the results of the 2 cases studied by Olsen et al (2005). Further research is needed to extent the knowledge in this field and to be able to generalize the results. More cases of complex procurement should be studied and compared. In future research to gain a complete perspective of the projects, it would be good to include as well the subcontractors.

Following the conclusion earlier it is recommended that in order to obtain good project outcomes, all three mechanisms must be jointly developed and tailored to each other. Otherwise one might impact the other negatively. It is therefore a managerial challenge to develop a productive rather than a counter-productive interplay. The next step should be to find prescriptions for the use of various governance mechanisms in different circumstances, to meet the managerial needs to find the optimal application of the governance mechanisms for the best results. To provide a recipe of which mechanisms to use and to what extent in which circumstances would be a great asset for complex procurements in order to obtain the best results.

Finally, explicit research is recommended about the role of trust in relation to the other governance mechanisms to provide further insights on the pre-mature conclusion that trust is a key factor in the application and choice of governance mechanisms.
REFERENCES


APPENDIX I: QUESTIONS FOR SEMI-STRUCTURED INTERVIEWS

Several key people were interviewed in the operator and integrator. The same set of questions was used for each interview.

INTERVIEW GUIDE

GOVERNANCE OF COMPLEX PROCUREMENT IN THE OFFSHORE OIL & GAS INDUSTRY:
MULTIPLIER EFFECTS IN GOVERNANCE MECHANISMS
CASE STUDY: CORMEN LARGE SUBSEA COMPRESSION
Open University, The Netherlands
MSc Supply Chain Management

First introduction of
- Who is interviewer
- Background and objectives,
- It is a university research, independent of any of the companies involved
- Anonymous and confidential
- Structure of the interview
Introduction & background (5min)

1. Name, position, company
2. What was your role in the project, and responsibilities
3. When were you working on the project?
4. Who were your most important contacts/interactions? E.g. day to day communication with?

Explanation of the different variables:

- Price/incentives: contract, including incentives
- Authority refers to the hierarchical mode of exchange: reliance on administrative procedures and control, was measured by the extent to which one party solely had the ability to determine terms of trade, and to what extent standard operating procedures for supervision were implemented.
- Trust refers to social mode of exchange: desire to continue the relationship for both social and economic reasons.
- Project outcomes refer to the results of the project, e.g. project completion (schedule), costs and quality, the level of integration between the different parties involved.

Incentives (10min):

1. Deliverables
   a. Was it clear to you specifically what the deliverables and tasks would be for the project team and you?
   b. Were the scope and deliverables realistic to your opinion?
2. Why were there no incentives in the project initially? What was the consequence of this? Did it impact the relationship? (e.g. level of trust between parties?)
3. During the project the contract with Aker was changed to one with incentives. What changed? Did the relationship with Aker change because of this? And the subcontractors?
4. How did it influence the outcomes of the project to your opinion?

Authority (10min):

5. Was there a clear responsibility for each party (and accountability)? How? Was this the appropriate way for this project to your opinion?
6. Are you familiar with the Steering Group authority? What was the role of the Steering group authority:
   a. How did this work in practice? Could you give an example?
   b. Should the steering group have acted differently in particular situations?
7. Project manager authority:
   a. What were the responsibilities of the Project manager authority? E.g. budget, scope, schedule
6. Was it clear what was the responsibility of the contractor, subcontractor and operator? How? Why?

8. Did authority in this project influence trust to your opinion? How?

9. Did authority impact the project outcomes?

Trust (15min):

10. Previous cooperation experience
    a. Have you or your company worked previously with the parties involved? How many years?
    b. Did you notice a difference working with the parties you worked with before and the "new" parties with regards to working relationship, coordination and results?

11. Nationalities in project team
    a. What were the nationalities present in the project team you worked with?
    b. How did this influence your work relation, coordination and results?

12. How would you describe the trust level in the project team with the different parties?

13. Openness in communication
    a. Do you consider there was openness in communication?
    b. How did you notice?
    c. Should it have been different?
    d. How did it influence your work and results?
    e. How did you receive your information?
    f. Could you openly discuss with the other contractors and subcontractors? Share all work-related information?

14. Kickoff:
    a. Was a kick-off program initiated at the start of the project? E.g. team building, work meetings
    b. How?

15. Were there enough (technical) resources present in the team? E.g. main contractor? Sub contractors? Management team?

16. Was the level of trust of influence on the (formal/informal) structure of the organization? Specifically on the authority level?

17. Did trust influence the incentives of the subcontractors? E.g. was trust/relationship driving the contractor to deliver or were there other mechanisms of importance?

18. Do you think that trust influenced the project outcomes? How?
Project outcomes (15 min):

19. Time within schedule
   a. How some certain elements in the project didn’t go according schedule? What was or was not? Why?
   b. How was it mitigated?
   c. Could this have been different? (E.g., Continuous problems with CVT? What has been done?)
   d. How were the governance mechanisms of influence on this?

20. Costs within budget
   e. What was the reason of going over budget?
   f. How was it mitigated?
   g. Was it effective? Why?
   h. What could have been done different?
   i. How were the governance mechanisms of influence on this?

21. Satisfaction with deliverable (quality)
   j. What do you think of the end result?
   k. Was it according agreement?
   l. How were the governance mechanisms of influence on this?

22. How do you feel was the integration with the different parties?
   m. Could you give examples? E.g., shared working space, meetings etc.
   n. Was it different with different parties?
   o. Why?
   p. How were the governance mechanisms of influence on this?

23. Did the combination of the different governance mechanisms influence the project outcomes?
    Could the results have been different? How?

Closing (5 min)

24. What were the main learnings from this project?

25. What should have been done different or better to your opinion?

26. What went very well in the project to your opinion?

27. Any other topics you would like to discuss that might be of relevance? Or something else you would like to share?