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HOW A PROJECT ALLIANCE INFLUENCES PROJECT PERFORMANCE COMPARED TO TRADITIONAL PROJECT PRACTICE

– FINDINGS FROM A CASE STUDY IN THE NORWEGIAN OIL AND GAS INDUSTRY

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Abstract: Practitioners and researchers have turned their attention toward collaborative arrangements and new Collaborative Project Delivery Models (CPDMs). In this paper, we present findings from a study focusing on the impact of a project alliance on project performance, as an example of a CPDM compared to traditional project practice. Findings are based on a case study where empirical data has been collected by carrying out semi-structured interviews with thirteen professionals within the Norwegian oil and gas industry. A main finding is that a project alliance contributes to better project performance by promoting a better working relationship between the partners compared to traditional projects. This result is achieved through closer cooperation, shorter decision paths, transparent partners, and an overall alliance culture tailored around collaboration. It is challenging to discover areas where the investigated project alliance has not been performing as expected or has performed worse than traditional projects. Findings also show some barriers related to the co-location and the interfaces between the companies, the project alliance, and the partner organizations. Conclusions drawn should be of interest to both researchers and practitioners contemplating to shift from a traditional project practice to a more collaborative one.

Keywords: Alliancing, Collaborative Project Delivery Model, Project performance

1. INTRODUCTION

Today, there is broad acknowledgment that engineering and construction projects face certain problems. Practitioners and researchers suggest, among other things, productivity problems, opportunistic behavior, and sub-optimization (Laan, Voordijk, & Dewulf, 2011; Matthews & Howell, 2005). One strategy for addressing these concerns is the development of Collaborative Project Delivery Models (CPDMs) (Lahdenperä, 2012; Malvik, Wondimu, Kalsaas, & Johansen, 2021; Tadayon, 2018; Tadayon & Anderesen, 2021; Young, Hosseini, Klakegg, & Lædre, 2018). A major goal of a CPDM is to avoid conflicting objects and problems that have characterized the industry for a long period (Ling, Rahman, & Ng, 2006). Collaborative models, such as alliancing, early contractor involvement, and partnering are known under the umbrella terms relational contracting or CPDMs (Af Hällström, Bosch-Sijtsema, Poblete, Rempling, & Karlsson, 2021; Bygballe & Swärd, 2019; Lahdenperä, 2012; Rahman & Kumaraswamy, 2004).

The project alliance can be defined as a CPDM in which the client and contractor usually collaborate through informal or formal agreements, together with the establishment of trust-based relationships to achieve common objectives (Lahdenperä, 2012). Researchers and practitioners have turned their attention toward collaborative arrangements and new CPDMs (Lahdenperä, 2012) to achieve better-performing projects by promoting a better working relationship between the parties (Suprapto, Bakker, Mooi, & Hertogh, 2016).

Attracting and accomplishing projects require that several partners work together; this is typically the case in the oil and gas industry, which started to use alliancing in the mid-1990s (Olsen, Haugland, Karlsen, & Johan Husøy, 2005). A suitable approach is chosen to inspire the parties to work rationally together to achieve the best outcomes in accordance with their common objectives and within the expected risk level (Morris & Pinto, 2007).

Generally, there is a need for more research exploring the link between collaboration and project performance (Bond-Barnard, Fletcher, & Steyn, 2018; Meng & Gallagher, 2012; Silva & Harper, 2018). We focus on how a project alliance might influence project performance as compared to traditional projects. The classic project performance constructs in terms of time, cost, and quality ("The Iron Triangle") is considered to be outside the scope of this study.

2 ALLIANCING AS AN EXAMPLE OF A COLLABORATIVE PROJECT DELIVERY MODEL (CPDM)

The project alliance is a relatively new CPDM that has started becoming popular as an alternative to traditional contracts (Young et al., 2018). According to Suprapto et al. (2016), an alliance project is likely to be more collaborative than a traditional project (also known as a lump sum contract).

To clarify the use of the term PDM, we use the definition by Miller, Garvin, Ibbs, and Mahoney (2000), i.e., "a system for organizing and financing design, construction, operations and maintenance activities that facilitates the delivery of a goods or service". Alliancing, as an example of a collaborative PDM, for short CPDM, can lead to improved outcomes in projects and value for money. This is in part due to the increased level of integration and collaboration between the players involved (customer and suppliers) (Love, Mistry, & Davis, 2010). The project alliance does not necessarily result directly in better project performance, but achievements are gained through relational attitudes and how they play out throughout the project in terms of actual teamworking behavior (Suprapto et al., 2016).

2.1 Alliancing factors

Deciding what alliancing is by means of a literature search might be confusing, however, the literature claims that it is possible to identify factors that appear to be key in an alliance. Hence, alliancing can be identified by factors, and the combination of factors makes the alliance model a unique CPDM (Young et al., 2018).

A project alliance is formed by a set of hard and soft factors (Fotopoulos & Psomas, 2009; Yeung, Chan, & Chan, 2007). Factors that are directly regulated by the project contract or have their basis in the procurement process are considered hard factors (such as a formal contract, and pain share/gain share), whereas soft elements contribute to the relationship between the project participants (such as trust, communication, and commitment) (Yeung et al., 2007).

Various authors have identified factors within the context of an alliance. A summary of factors *(1)* researchers have found for describing an alliance is presented in **Table 1**. Each of the following will be outlined in further detail: Collaborative problem solving, trust, co-location, pain/gain share, open book approach, commitment, single alliance culture, communication, workshops, a single IT system, no blame, mutual goals and objectives.

Collaborative problem solving emphasizes that all members of the project alliance work together to overcome problems that arise (Tadayon, 2018).

Trust is especially important to fully realize the potential of the project alliance. Examples of formulations used to describe the factor are "trust between parties" (Jefferies et al., 2014) and "mutual trust" (Biggs, 2004).

Co-location of the project alliance is a mechanism for realizing the effect of an integrated project team (Tadayon, 2018). A central alliance office combining all alliance partners (Jefferies et al., 2014) is often identified in the literature as a key factor (Laan et al., 2011).

Pain/gain share. All members of the alliance share in the profits and losses of the alliance project and ensure that no single participant is held responsible for financial performance (Laan et al., 2011).

Open book approach. A key factor for the project alliance is the open book approach (Tadayon, 2018), allowing the individual alliance partners to have an open and trusting relationship with one another (Jefferies et al., 2014).

Commitment to the project alliance is a key factor by having a dedicated client and stakeholders showing commitment to the project through participation at a senior level (Jefferies et al., 2014). This is important not only to ensure that the alliances receive the necessary resources, but also to convince others throughout the organization of the importance of the alliance (Elmuti & Kathawala, 2001).

Single alliance culture. The project alliance can be seen as being established to unite culturally different partners in pursuit of a common objective (Biggs, 2004). All members of the alliance, regardless of their holding company, are part of the team (Tadayon, 2018).

Communication. Effective communication between the partners is a vital factor for the project alliance to be successful (Elmuti & Kathawala, 2001).

Workshops are organized to develop and maintain the culture in the project alliance and the best-for-project mindset (Tadayon, 2018). Jefferies et al. (2014) identified pre-project and planning workshops by organizing early workshops for all members of the alliance prior to the client-focused workshops in order to build good working relationships.

TABLE 1. EXAMPLES OF FACTORS DESCRIBING AN ALLIANCE

Factor	Reference
Collaborative problem solving	Jefferies, Brewer, and Gajendran (2014), Young et al. (2018), Biggs (2004), Tadayon (2018)
Trust	Jefferies et al. (2014), Biggs (2004), Lahdenperä (2012)
Co-location	Young et al. (2018), Jefferies et al. (2014), Tadayon (2018)
Pain/gain share	Young et al. (2018), Tadayon (2018)
Open book approach	Young et al. (2018), Jefferies et al. (2014), Tadayon (2018)
Commitment	Jefferies et al. (2014), Biggs (2004) Elmuti and Kathawala (2001), Lahdenperä (2012)
Single alliance culture	Biggs (2004), Tadayon (2018), Young et al. (2018)
Communication	Jefferies et al. (2014), Elmuti and Kathawala (2001), Lahdenperä (2012)
Workshops	Jefferies et al. (2014), Young et al. (2018), Tadayon (2018)
A single IT system	Young et al. (2018) Jefferies et al. (2014), Tadayon (2018)
No blame	Young et al. (2018), Tadayon (2018)
Mutual goals and objectives	Jefferies et al. (2014), Young et al. (2018), Lahdenperä (2012), Tadayon (2018)

1. WE USE THE TERM FACTOR. HERE, FACTORS INCLUDE CRITICAL SUCCESS FACTORS, SUCCESS FACTORS AND ELEMENTS, AS TERMS ARE USED INTERCHANGEABLY IN THE LITERATURE.

No blame. The foundation of the alliance agreement is based on everyone working in the same team (Tadayon, 2018). In this agreement, a key factor is the development of a no-blame culture. No blame culture refers to the degree to which the parties take responsibility for problems as they arise rather than avoid them (Walker and Lloyd-Walker, 2015).

A single IT system can be seen as a tool used by an alliance (Young et al., 2018), ensuring that every member of the alliance has access to the same programs and files (Tadayon, 2018) and allowing the individual alliance partners to manage resources and share knowledge (Jefferies et al., 2014).

Mutual goals and objectives. Examples of formulations used to describe this factor are “common goals” (Young et al., 2018), “shared objectives” (Biggs, 2004), and “common goals and objectives” (Lahdenperä, 2012).

Existing research describes what is being done in CPDMs (Malvik et al., 2021; Tadayon, 2018; Tadayon & Anderesen, 2021; Young et al., 2018), but there is a lack of studies looking at how the two different project types, a traditional project as compared to a more collaborative one, influence project performance (Suprapto et al., 2016). Let us proceed to the methodology.

3 RESEARCH METHODOLOGY

We have chosen a case study approach to address our research question, stated as:

- RQ1: How does a project alliance, as an example of a CPDM, influence project performance compared to traditional project practice?

We utilize a single case study with a single unit of analysis (Robert K Yin, 2008). In this research, the single case unit refers to the alliance in a case company (the oil company) and is restricted to the boundaries within this alliance.

3.1 Case – project alliance within the Norwegian oil and gas industry

The oil company, an independent oil and gas company engaged in upstream operations, requested to be unnamed and anonymous, a request which we honored. The responsibility of the investigated case is to deliver smaller

The oil company uses a common governing model for all its alliances. Each contractor enters into a separate frame agreement with the oil company. The alliance agreement and its appendixes then govern the alliance as a whole. This agreement regulates different terms regarding the project alliance, such as key principles, alliance organization, execution of work, dispute resolution, and other regulatory terms within the project alliance.

The compensation model of the project alliance is built upon a target cost for projects, Most Likely Cost. In this model, there is far less downside for the contractors as compared to traditional projects. In any case, they only stand to be liable for their share of the 20 percent of the overrun for the whole project. This is in contrast to traditional projects, where they agree on one compensation sum and are then liable for the total of the potential overrun of the compensation. Thus, from this compensation model, we see that the oil company in the project alliance takes on significant responsibility for potential overruns.

We have limited the scope of research to one alliance within the Norwegian oil and gas industry, as we are collaborating with the oil company on this study.

3.2 Literature review about factors of an alliance

A literature review was done before the interviews were held. We used the CPDM as a framework. Furthermore, the literature claims it is possible to identify factors that appear to be key to an alliance (Young et al., 2018). For project management, the literature distinguishes between hard and soft factors in literature (Fotopoulos & Psomas, 2009; Yeung et al., 2007). Journal articles representing the most recent literature and containing comprehensive and very relevant literature on CPDMs, were used to gain a broad perspective of the current views on this topic. A pre-scan of factors relevant for this topic, as well as factors identified by the oil company as key for the alliance performance, was conducted before making the interview guide. A list of factors identified by the literature formed the basis that defines alliancing. We concluded on a number that was of interest to this study. Table 1 shows examples of factors (both soft and hard) describing an alliance, as an example of a CPDM.

3.3 Data collection

The data collection includes both quantitative and qualitative data, complementing each other.

The case was researched using a qualitative method, and we conducted semi-structured interviews (Mason, 2018). According to Patton (1990), the goal of qualitative research methodology is to gather extensive data on a specified subject. Instead of using a randomized selection to generalize the data, one chooses the participants with the most extensive knowledge about the research subject. In our case, this meant that we had to find interviewees who had extensive knowledge about project alliances in combination with experience from more traditional projects. We asked our contact in the oil company to find personnel with these characteristics and had him communicate the message to his contacts.

The survey was conducted using a quantitative method (De Vaus, 2014). The interviewees were asked to rate their experience performance of the project alliance and any relatable traditional projects for several variables. For this survey, a 1-10 scale was used. The findings from the quantitative survey are also presented in the findings section. We emphasize that it is the same interviewees answering the quantitative survey who were interviewed in the qualitative interviews. The extra dimension provided by the quantitative results is the means of measurement and comparability.

Through our contact with the oil company, we reached out to fourteen experienced persons, who all confirmed that they were willing to participate. Of these fourteen, one had to cancel due to illness. This left us with thirteen interviewees, which was a number we felt satisfied with. This strategy is referred to as the snowball method (Johannessen, Christoffersen, & Tufte, 2011), and it proved an effective way of gathering the correct people for our interview process. Our respondents held varying management positions within the project alliance, and 15 percent were women. An overview of the thirteen respondents in question and their respective holding companies can be seen in **Table 2**.

All interviews were conducted over a period of two months. We made sure the roles of the researcher in the interviews were consistent throughout the process, as it created a predictable collection of data. One of the authors was always responsible for conducting the interview, with the remaining authors noting down the main thoughts shared by the respondents. We did not make any recordings of the interviews, something which required extensive and detailed notes.

TABLE 2. OVERVIEW OF THE INTERVIEWEES

Interviewee	Organization	Alliance	Duration
TP1	The technology provider	Project alliance	55 min
OC 1	The oil company	Project alliance	65 min
OC 2	The oil company	Project alliance	50 min
OC 3	The oil company	Project alliance	43 min
OC 4	The oil company	Project alliance	55 min
OC 5	The oil company	Project alliance	60 min
O-S S 1	The oilservice supplier	Project alliance	67 min
O-S S 2	The oilservice supplier	Project alliance	50 min
O-S S 3	The oilservice supplier	Project alliance	45 min
EPC S 1	The EPC supplier	Project alliance	45 min
EPC S 2	The EPC supplier	Project alliance	45 min
EPC S 3	The EPC supplier	Project alliance	50 min
EPC S 4	The EPC supplier	Project alliance	55 min

3.4 Data analysis

To interpret and analyze the data collected in our study, we had to process it into easily accessible codes and themes. This approach is based on the work by Creswell (2009) and his model of data analysis. The process is explained in detail below.

The first step consisted of writing up summaries of the 685 minutes' worth of notes. With Norwegian being the native language of the interviewees, it seemed natural to interview in this language. The notes were written the same language to keep the data consistent with the wording of the respondents. Furthermore, it is important to specify that the citations presented in Findings were translated from Norwegian into English. The transcriptions were made right after each interview to minimize the risk of misunderstandings and misinterpretations. Step two consisted of reading through the summaries, providing us with a general sense of the data and its meaning. We decided to mark different themes that could be of interest when discussing the research question at hand. These markings turned out to be very helpful when categorizing the data. In step three, the main goal was to create codes to help categorize the data found in the summaries. We utilized MaxQDA to manage, organize, and code the material, a computer-assisted software used for qualitative data analysis. The fourth and final step in Creswell's model (Creswell, 2009) covers how the coded data is interpreted. In this phase, we sought to combine our knowledge of relevant literature with the interpretations derived from the empirical data. This comparison between recognized literature and newly collected data made it possible for us to establish whether our findings confirmed or diverged from earlier findings, how the two different project types influence project performance, thus prompting us to dive deeper into the subjects that required it (Creswell, 2009).

All respondents were briefed before the interviews, whereby we explained what the goal of the study was, as well as informed them about their rights as informants. Each interviewee was encouraged to speak freely on the questions. If something was unclear, the interviewer asked control questions. To further ensure informed consent, a summary was sent out post-interview for correction and confirmation, along with a summary of our strategy for handling sensitive data. We informed the respondents both pre-interview and post-interview that everything shared would be handled confidentially and that nothing could be traced back to them personally. Formal consent to data collection and storing was obtained from the Norwegian Centre for Research Data. The research was conducted in accordance with the national standard guidelines for research ethics and the specific ethical guidelines for science and technology (Technology, 2016).

The result from the case projects represents the experiences of practitioners and is limited by their memories. The interviewees provided us with answers to the best of their knowledge.

3.5 Method assessment

External validity says something about whether the findings of the study can be said to be relevant outside the given context (Robert K. Yin, 2014). Only one alliance was examined. The project alliance was also a reasonably new alliance, with realistically only one project behind them. Thus, the data collected would be heavily influenced by this one project and by the fact that they are in the start-up phase of the alliance. Alliances with more experience might display different views and perspectives. These aspects could be considered as weaknesses (or limitations) but can also be easily optimized in further research.

Reliability, the consistency and repeatability of the research procedures used in case studies (Robert K. Yin, 2014), refers to whether we can believe the information that the data collection provides us with. We made sure the roles of the researcher in the interviews were consistent throughout the process, as it created a predictable collection of data. As it is qualitative, the data collected is dependent on both the context and the understanding of the researchers conducting the interview. We sought to remove some of this influence by having all researchers present write down their notes, before collecting and summarizing everything into one document. The summary was then sent to the respondents post-interview for correction and confirmation. This process ensured that our notes were, in fact, representative of what the respondents wanted to share, as well as reducing the effect of the researchers' potential bias.

4 FINDINGS FROM THE INTERVIEWS AND THE SURVEY

This section presents the empirical findings pertaining to the research question RQ1: How does a project alliance, as an example of a CPDM, influence project performance compared to traditional project practice? Based on our case study, we identified different areas of importance as critical to the project alliance's performance. Some of the most significant contributions are shown in **Table 3**. In this table, a (+) symbol indicates where experienced persons see a favorable direction, as opposed to a (-) symbol indicating the opposite.

4.1 Findings from the interviews

4.1.1 Conflict level

Going into the interviews, the degree of conflict between partners in the project alliance created the biggest interest. Several interviewees explained that the project alliance establishes platforms for exploring different solutions and opinions. The flat structuring of the project alliance, with teams consisting of people from the different companies, enabled earlier decision making and better information flow. One of the main topics brought up by the interviewees was the breakdown of "silos" in the project organization. "Silos" refers to departments not cooperating. There were still conflicts in the project alliance, but they were resolved earlier and quicker compared to traditional projects. The conflicts were also of a less severe degree. A manager from the EPC supplier had this to say about the conflict level:

"In the alliance, we experience the level of conflict as lower than in traditional projects. The alliance encourages discussion of disagreements, and we can find solutions. In traditional projects, we often experience that those conflicts do not limit themselves over time". (EPC S2).

This statement is particularly impressive when considering the context: that the interviewee represents the construction contractor (the EPC supplier). Construction is a big part of the project and generates a significant contribution to the costs. This is naturally prone to promote both discussions and conflicts. Collaborative problem-solving takes time, and time is money. It is expensive to spend time dealing with arguing and disagreements with consultants, contractors, or others. Another manager from the EPC supplier explained:

"There have been tough discussions in the project alliance, but we have managed to conclude and move forward. The traditional long discussions regarding responsibilities, extra work, and cost we often see in traditional projects have been absent in the alliance model." (EPC S3).

When asked about the conflict level in the project alliance, several interviewees mentioned the lack of formal correspondence. In traditional projects, the partners send a lot of formal letters to each other to ensure legal rights and traceability. In this case, formal letters refer to a process conducted when two or more parties are in disagreement, and they are not able to decide the issue without involving an objective third party, often higher up in the company hierarchy. This was described by the interviewees as a tedious and time-consuming process with a negative impact on the operational performance. In the project alliance, however, there were close to no formal letters sent. An interviewee from the technology provider explained:

"There has only been sent one formal letter during the [….] project. In traditional projects, we would lose count of the number of formal letters sent between partners." (TP1).

The low degree of formal correspondence shows how the project alliance opens up the collaboration. The risk distribution prompts coinciding incentives. With the compensation model focusing on the project as a whole, companies can openly discuss and collaborate. This process also reduces the pursuit of hidden agendas aimed at ensuring personal gain.

Even though almost every interviewee was quite eager to express how low the conflict

level was, there seemed to exist some bias among the respondents due to consensus orientation within the project

The project alliance	Traditional projects
Low conflict level	***High conflict level***
(+) Conflict of less several degree	(-) Escalating conflict
Low degree of formal correspondence	***High degree of formal correspondence***
(+) Close to no formal letters sent	(-) Use formal letters to ensure legal rights and traceability
Quicker decision making	***Long decision making***
(+) Encourages discussion of disagreements that result in earlier decision making	(-) Long discussion regarding responsibilities, extra work, and cost
Consensus oriented - flat structuring	***Less solidary/consensus oriented***
(-) Lack of joint perspective on where the alliance is headed	(+) A distinct customer to lead the process
(+) A unique alliance culture	
(+) Trust	
(+) Incentives to open up and share information	
(+) Prevent hidden agendas	
Early involvement of parties - breakdown of "silos"	***Late involvement of parties – "silos"***
(+) The entire value chain works together	(-) Lack of collaboration across their responsibilities in value chain
(+) Understands the project as a whole	
(+) Increased responsibility for the lifetime of the project	
Co-location	
(+) Closing the physical and organizational distance between companies and fields	
(+) Parties share experiences between each other and between phases	
(+) Enables a steady flow of communication between parties	
(+) Strengthens the collaborative bonds between employees	
(-) Lack of co-location	
Risk share/reward	***Risk transfer***
Prevent double roles	***Mirrored roles***
(+) Delegated resources	(-) Ensuring control over other companies
More productive	***Less productive***
(+) Early information flow	(-) Lack of accurate and important information between phases in value chain
(-) Lack of innovative solutions	
(+) Copying former solutions	
(+) Innovative with products, documentation, lifetime, and procedures	
A single IT system	
(-) Lack of common IT system	

TABLE 3. THE PROJECT ALLIANCE, AS AN EXAMPLE OF A CPDM, COMPARED TO TRADITIONAL PROJECT PRACTICE

alliance. Alliance culture was a primary focus going into the project alliance, and after our initial interviews, it was evident that there existed a unique culture in the project alliance. Several interviewees claimed it would be difficult to identify the employer of a randomly selected member of the project alliance. Informants also spoke about their employer holding companies in the third person, referring to the project alliance as "we" and the employer holding firm as "they". There might also be some bias in the data since the interviewees themselves have incentives for the project alliance performing well. When applying the conflict level to this context, it was evident that there existed strong incentives for consensus within the project alliance. A manager from the oil company explained:

"Building an alliance culture takes time, and we should perhaps have used even more time than we did. Even though we underestimated the potential for conflict, I believe it will be reduced once the alliance model is fully realized. The project alliance is much more consensus-oriented." (OC1).

4.1.2 Trust, culture, and coinciding incentives

As stated by the interviewees, it is clear that trust, along with alliance culture, had been one of the major foci going into the project alliance. Given the contractual model of the project alliance, the companies have incentives to open and share information as they all share potential upsides and downsides of the project. The different companies and members within the project alliance felt that they were working towards a common goal with shared incentives. None of the interviewees believed there existed any hidden agendas in the project alliance. There were some conflicting statements, but the majority pointed to trust and the unique culture as the most crucial contributor to creating shared incentives.

"I think the majority of the members of the alliance do not know the compensation model of the alliance, and that trust between the companies is the main driver for creating coinciding incentives." (O-S S 3).

"Trust has been a critical factor from day one. Without it, the alliance model would not have worked. I have not encountered any situations where we did not comply with this. There have been disagreements but never breach of trust. Everyone has played their part and contributed to building trust. The majority of people I meet wants the alliance to succeed." (OC 2).

Even though the interviewees pointed to the alliance culture as being the most important, this culture is based upon the contractual framework governing the project alliance. When creating the project alliance, culture was identified as a critical factor for success, thus making the project alliance in itself a contributor to creating shared incentives. When establishing a project organization with a high degree of trust given to its suppliers, one may lose some degree of governance and direction. This shows how the very foundation of the alliance model, trust and culture, also causes some downsides. The overall impression of the empirical data points to trust and alliance culture as absolutely vital to the alliance's performance.

There were some concerns regarding the consensus orientation in the project alliance. Some managers felt too much trust was given to the project alliance itself, and that the project lacked a distinct customer to lead the process:

"We experience that (the oil company) gives the project alliance too much responsibility and there is no joint perspective on where the project alliance is headed and what the goals of the project alliance are." (O-S S 2).

As the alliance model is inherently more solitary, the well-implemented structure of an overseeing customer is, to some degree, broken down. Interviewees noted that a vital role for the customer is to supervise and govern the process. It is, therefore, important that the involved companies understand what it means to work within the alliance model. Here, the education of the members working in the project alliance is vital.

4.1.3 Co-location

The co-location is, in many ways, the enabler for the other

presented factors to happen. On the basis of the interviews, it is clear that co-location was one of the most important factors determining the project alliance's success. Conflict, trust, transparency, and coinciding incentives all rely on good communication and easy access to other members of the alliance organization. Thus, co-location must be viewed as a factor contributing to the alliance's performance. Co-location can shorten the path to information and enable earlier decision-making and less work in silos. One of the reasons why it was so crucial to the performance of the project alliance was that it contributed to closing the physical and organizational distance between the different fields in the project. For example, the oil company, being responsible for engineering and design, more or less left the project after the design phase of the project. The EPC supplier, being responsible for construction, would essentially not be involved until after the design phase was finished. Now, every partner is present throughout the whole project's lifetime. This, of course, is a major benefit as the parties share experiences between each other and between phases.

Co-location enables a steady flow of communication between parties and helps strengthen the collaborative bonds between employees. The project alliance is currently co-located in one of the largest cities in Norway, where employees and managers are located in the same office building. This creates a swifter and more precise flow of information and resources. The exception was the EPC supplier, as the yard was located some 600km away. This created some distance between the construction and the planning of the project. Especially the EPC supplier found this challenging:

"The majority of planning and engineering in the project alliance is situated in (one of the largest cities in Norway), while the execution happens (some 600km away). In certain periods we could have been more co-located, especially in engineering and procurement. When co-locating, you have a better collaboration than one does through Skype or e-mail." (EPC S2).

Going forward, the project alliance should allow for more dynamic co-location at other offices when needed.

The project alliance created cross-organizational teams that involved people from different partners. Involved members were then able to share knowledge to a high degree. The most significant contribution mentioned by the interviewees was how the entire value chain worked together. Several respondents pointed to a notable increase in "process competence". "Process competence" refers to competence relating to the processes and organization within the project organization. A manager from the technology provider had this to say:

"The collaboration in the alliance makes us able to experience more than just a small part of the work process. We get to take part in the whole picture. I am certain that the alliance contributes to increasing competence. It seems like a majority of the co-workers feel more responsible in the alliance, which in turn increases the understanding of the project as a whole. This increases their competence as well." (TP1).

In the project alliance, there had been a focus on removing so-called double roles in the project. In a traditional project, the different companies often had mirrored roles that served as governing and controlling functions, ensuring control over what the other companies were doing. There were some conflicting experiences as to the degree of double roles in traditional projects, but most interviewees agreed that they traditionally experienced some dual functionality. The interviewees agreed that the project alliance removed some of this by having delegated resources. A manager from the oil-service supplier had this to say about double roles:

"The avoidance of double working is one of the most positive aspects of the alliance. Co-location has been central in avoiding double working." (O-S s 2).

4.1.4 Productivity versus innovation

The main goals of the project alliance were to create an organization that allowed for increased productivity when compared to traditional projects. The empirical data points to the project alliance as indeed being more productive than traditional projects. A manager from the EPC supplier said the following about the productivity:

"The productivity was on par with the ambitions of the projects, even though the bar was raised going into [the project alliance], with higher goals and ambitions compared to more traditional projects." (EPC S 1).

In the alliance framework, it is stated that innovation should be used as a tool to increase productivity. Although innovation is stated as a goal in the governance documentation, the interviewees illustrated some clear conflicting interests. In our study, when talking about innovation, it is more often than not related to new products or solutions. The empirical data seemed to suggest that a major contribution to the productivity of the project alliance's output was, in fact, the lack of innovation. Furthermore, the data showed that productivity was closely linked to the standardization and copy effects. A manager from the EPC supplier explained further:

"... Another example is that it is typical for the industry that the projects have a high degree of tailored solutions, even though there are intentions of copying former solutions. Thus, it is innovative in itself that the project alliance manages to increase the degree of copying." (EPC S 1).

Another distinct advantage of the alliance is the collaboration form in itself, as presented earlier. Several of the interviewees pointed to the short decision paths and good workflow as major contributions to the project alliance performance. The direct cost of correspondence and the indirect cost of waiting for information add up to a high and often neglected cost. Some also pointed to the dynamic contractual model as a strength for productivity as it removed some of the uncertainty experienced in traditional projects. A manager from the oil-service supplier stated the following about the productivity of the alliance:

"In engineering, we have experienced excellent productivity compared to more traditional projects. The information flow was already a priority in the FEED stage. In a traditional project, this focus would come at a much later stage." (O-S S 2).

In traditional projects, members of the different parts of the projects would not necessarily collaborate across their responsibilities. For instance, the engineering and design team would be more or less finished with the project when the handover to the construction was completed. In the project alliance, the different companies follow the project and have more responsibility for the whole lifetime of the installation. A manager from the EPC supplier had this to say about how the alliance model enabled a change in their approach:

"The alliance will have a greater responsibility for the lifetime of the projects compared to traditional projects." (EPC S 3).

As a whole, the factor of innovation was one of the most splitting factors in the study. Some interviewees indicated that the project alliance was very good at promoting and achieving innovation. Others claimed that the project alliance tried but failed to achieve an edge in innovation over traditional projects. A manager from the oil-service supplier had this to say about innovation:

"I do not think that the alliance model has contributed to innovation. I fail to see how the model is a major advantage. The alliance model in itself is supposed to be more efficient and contribute to the work being done faster, but I cannot say I have seen particularly innovative solutions." (O-S S 3).

This view backs up the notion that the alliance business model itself stands for most of the increase in innovation. A manager from the EPC supplier also pointed to other areas of the business model that he thought of as innovative:

"The alliance in itself is an innovative business model within the industry. The alliance has also been innovative with products, documentation, lifetime, and procurement." (EPC S 1).

When asked to identify the biggest downsides of the project alliance, the interviewees pointed to interfaces as the most underachieving area in the project alliance. Most notably, IT systems had given rise to some issues in the alliance work. The largest problems, however, arose with regard to communication. A manager from the technology provider said:

"It is the everyday processes that have been challenging. This has set back productivity, but it has been somewhat mitigated by co-location. For instance, (the EPC supplier) stopped using Skype and started using Teams." (TP1).

A manager from the oil company had the following to say about the interfaces:

"The use of a common IT system has not worked well. These areas were a big black hole when starting up the project alliance. The governance model should have been more specific on the matter of establishing a functioning system structure. There have been done extensive work to fix the systems, and we have achieved an acceptable solution, but there is still a lot missing." (OC1).

Some issues related to the handover of work between the different companies were also noted.

4.2 Findings from the survey

For this survey, a 1-10 scale was used. The geometrical means and standard deviation are presented in **Table 4**, and the means are graphically presented in **Figure 1**.

According to the variables shown in **Figure 1** and **Table 4**, one can see a notable difference between the experienced performance in traditional projects versus in the project alliance.

When asked to quantify the difference in experienced performance between the two collaboration forms, the informants showed strong support for the alliance model, as shown in **Table 4** and **Figure 1**. It is challenging to discover areas where the project alliance has not been performing as expected, or worse, than traditional projects. Some consensus orientation and strong incentives for the project alliance to perform well were also noted. This, in turn, makes it even more challenging to identify areas that are not performing, as it is not in the informants' interest to identify them. The most notable differences are related to the variables trust, transparency, and collaboration. The data also indicated that the conflict level is reduced in the alliance model. The least significant difference can be found in the variable IT systems. As discussed in earlier sections, one of the few issues directly identified by the interviewees was interfaces between the companies, the project alliance, and the partner organizations. The IT system had proven to be difficult, as firewalls and different policies made it difficult to communicate. The IT system variable in **Table 4** and **Figure 1** illustrates how the project alliance has failed to work out the technical issues. Thus, this phenomenon was expected to be illustrated in the quantitative data as well.

Variable	Traditional		Alliance	
	Mean	SD	Mean	SD
Conflict level	6.0	1.5	8.3	1.3
Collaboration	5.6	0.9	8.4	1.0
Trust	6.0	1.1	8.5	0.8
Transparency	5.1	1.9	8.7	1.1
Co-location	5.0	1.8	7.5	1.2
Competence Increase	5.3	1.3	7.9	1.0
Double Working	5.4	2.2	6.9	2.6
Productivity	5.9	1.4	8.4	0.7
Innovation	5.0	1.8	7.1	2.0
IT-systems	5.4	1.7	5.7	1.7

TABLE 4. RESULTS FROM THE QUANTITATIVE SURVEY

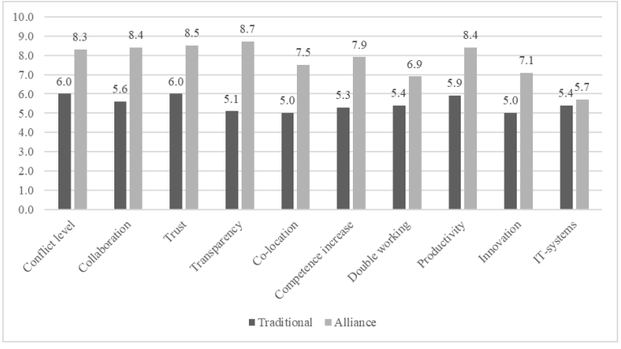

FIGURE 2. GRAPHICAL REPRESENTATION OF PROJECT ALLIANCE VERSUS ANY RELATABLE TRADITIONAL PROJECT

5 DISCUSSION

The empirical results indicate that there exists a much lower degree of conflict within the project alliance, compared to more traditional projects. This result is, according to our findings, achieved through closer cooperation, shorter decision paths, transparent partners, and a single alliance culture tailored around collaboration. What is interesting in this respect is how the oil company has managed to keep all partners in the project alliance satisfied with the alliance model, regardless of the role they play in the value chain. Some interviewees expressed that they often forgot that some of their colleagues belonged to different companies when working together in the project alliance.

Cultural differences can easily occur when several companies work together (Biggs, 2004). Alliance culture was a primary focus going into the project alliance. In this regard, the oil company has been very successful when designing their alliance model, as there existed a unique culture in the project alliance. In literature, a single alliance culture is identified as a key factor of an alliance (Biggs, 2004; Tadayon, 2018; Young et al., 2018); all partners within the project alliance, regardless of their employer, are part of the same team (Tadayon, 2018).

It was evident that the oil company invested both time and resources into creating a trusting environment when establishing the project alliance, and the findings indicate that they have been mostly successful. The interviewees in our study were satisfied with the level of transparency between partners in the alliance, and many were convinced that it was one of the main drivers behind the alliance's success.

Even though the alliance model lays the groundwork for a common goal mindset, some challenges still exist. The partners pointed expressly to the relationship between the partners as most significant in regard to the project alliance's performance. When establishing a project organization with a high degree of trust given to its suppliers, one may lose some degree of governance and direction. This shows how the very foundation of the alliance model, trust and culture, also causes some downsides. The overall impression of the empirical data points to trust and alliance culture is vital to the project alliance's performance.

As presented by our findings, one of the main topics brought up when discussing the level of conflict in the project alliance was how conflicts were resolved earlier and more efficiently compared to traditional projects. Several interviewees stated that when an issue arose, there seemed to exist a consensus orientation of some sort in the project alliance. This consensus could stem from the team-building investments the oil company made early on when initiating the project alliance, which paid off through developing employees with a genuine wish to resolve the issue as fast and as efficiently as possible. Based on our findings, the consensus was that while working in the alliance, the need to send formal letters was significantly reduced, which in hand boosted the alliance performance, as well as created a more collaborative workforce in the long run. The foundation of the alliance agreement is based on everyone working in the same team (Tadayon, 2018). In this agreement, a key factor is the development of no-blame culture (Tadayon, 2018; Young et al., 2018). No blame culture refers to the degree to which the parties take responsibility for problems as they arise, rather than avoiding them (Walker & Lloyd-Walker, 2015).

The oil company identified co-location as one of the key factors contributing to the performance of the project alliance. Interestingly, this was also the consensus of the respondents in our case study. According to one interviewee, the close distance between different fields in the project contributed significantly to the performance of the alliance, due to closer collaboration and a lower degree of conflict. This aligns with what the oil company wanted to achieve with their co-location, which points towards a successful implementation. Although most of the interviewees were happy with how the project alliance handled co-location, some felt it could improve, more specifically by having the construction team located closer in the engineering phase. Co-location is identified as a key factor of an alliance in literature (Jefferies et al., 2014; Tadayon, 2018; Young et al., 2018), and as a mechanism for realizing the full effects of an integrated project team (Tadayon, 2018).

Interfaces between the partners have been an issue. Problems with IT systems and the day-to-day communication tools such as Skype for Business and Microsoft Outlook have set back the productivity of the alliance. Firewalls and different policies impede the different systems from interacting with each other. The lack of governing guidelines initially seems to have contributed to this issue. Interfaces between companies and other alliances are crucial elements in the alliance model. With regard to the benefits discussed earlier, the communication and interaction between companies can function both as an enabler and as a barrier. Thus, ensuring functional interfaces in the alliance model is a key factor for its performance. Although questioned by Tadayon (2018), a single IT system is in literature identified as being a key factor in an alliance (Jefferies et al., 2014). In order for alliancing to be successful, significant interaction and communication is required between the partners.

6 CONCLUSION

On the basis of the data material, there is no doubt that the increased level of collaboration between the involved players is a major benefit to the alliance's performance. This result is, according to our findings, achieved through closer cooperation, shorter decision paths, transparent partners, and an overall alliance culture tailored around collaboration.

It is challenging to discover areas where the project alliance has not been performing as expected, or worse than traditional projects. The results were reviewed in detail in the 4.1 Findings from the interviews chapter. The findings show some barriers related to the co-location and the interfaces between the companies, the project alliance, and the partner organizations. Getting four independent companies to communicate and collaborate without problems occurring is difficult. The interfaces between the alliance partners, mainly the day-to-day communication, were found to be challenging. This results in unnecessary costs that could otherwise have generated value in the project alliance. There were also some barriers related to how the project alliance handled co-location; some felt this could improve.

The project alliance, as an example of a CPDM, has given rise to a new mindset as a result of its business model. This concept is, as previously stated, a new concept, at least within the Norwegian oil and gas industry. In this project alliance, the partners have a greater responsibility for the project as a whole, compared to a more traditional project. The strength of the project alliance is transparent in how companies are able to rethink their role in the project. In traditional projects, the firm will have strict roles and responsibilities. With the project alliance, the boundaries are shifted, and this, in turn, makes for innovative and rewarding new ways of thinking.

We limited the case study to one alliance within the Norwegian oil and gas industry. Future research should take the concepts developed in this study and apply them to a broader scope. It is also important to note that this study only focused on managerial positions within the project alliance. Other members might have other experiences, and this should be explored further. Thus, a study involving members from all levels of the project alliance would be preferable.

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