



BI Norwegian Business School - campus Oslo

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Master Thesis

Thesis Master of Science

Project Management: A case study on how project partnering and multidisciplinary team affect team performance in a highly technological project.

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## **Abstract**

**Purpose** - The purpose of this study was to investigate the effects of project partnering and multidisciplinary team on team performance. We explored what contributed to team performance in a complex project.

**Design/methodology/approach** - A single-case study of a Norwegian construction project which utilized project partnering and multidisciplinary teams. The data was collected through semi-structured interviews with 15 key participants, through an iterative abductive reasoning approach.

**Findings** - The main results suggest that project partnering enabled the project's autonomy by empowering the project participants. Moreover, our findings suggest that project partnering contributed to team performance by utilizing an informal team-oriented problem-solving approach, overall in the project. The approach enabled cost savings and created common goals, which the project partners could collectively work toward. Also, the diverse set of resources possessed by the project partners strengthened the autonomy in the project. Consequently, team performance was positively influenced by the inclusion of different disciplines, experiences, and expertise.

**Implications** - Project partnering and multidisciplinary teams have a combined complementary effect on team performance. Our data indicated a significant positive impact on team performance derived from top management support. The major shareholders were personally engaged in the project, which positively affected team performance and project outcomes.

**Research limitations/future research** - The study was naturally limited by its case study design, and future research is needed to uncover contributing factors to team performance. Future research should explore the effects of contractual rigidity and contractual flexibility in regard to team performance. Also, there is limited research on how top management support influences team performance.

**Originality** - The research is uniquely focusing on the team performance effect derived from project partnering and multidisciplinary team in a complex project, which has received limited previous research.

**Keywords** - Project partnering, Multidisciplinary team, Project management, Team performance, Contract flexibility, Top management support

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## **Part I: Introduction**

Projects can be exposed to a considerable degree of information asymmetry, especially when the project takes place in a complex and dynamic environment (Renwick & Tierney, 2020). Information asymmetry exists when one party holds more information than the other party. Research suggests that both parties, such as clients and consultants, have incentives to behave opportunistically when information asymmetry is present (Dawson, Watson, & Boudreau, 2010). As a result, some organizations create project designs that utilize individual information accessibility by incorporating different project contributors as project partners. Also, focusing on including individuals with different educational backgrounds into multidisciplinary teams (Bahadorestani, Naderpajouh, & Sadiq, 2020). A project team is considered multidisciplinary when team members possess diverse background expertise and skills (Hussein, Hasan, & Murtuza, 2017; Krajewski & Ritzman, 2005).

Although project partnering does not have a universally agreed definition, the most prominent definition involves the aspects of creating relationships and improve performance (Bellini, Aarseth, & Hosseini, 2016). Therefore, project partnering may be seen as “a relationship strategy whereby a project owner integrates contractors and other major contributors into the project” (Børve, Rolstadås, Andersen, & Aarseth, 2017, p. 690). Meaning that the creation of project partnering is a gradual and emergent process in which the structure and attitudes between the project participants are continuously altered to create a cooperative relationship (Eriksson, 2010). Furthermore, creating common goals between project partners develop trust and openness (Bellini et al., 2016; Cheung, Suen, & Cheung, 2003).

Research universally agrees that trust and openness contribute to improved project performance (Du et al., 2016; Ghazinejad, Hussein, & Zidane, 2018; Suprpto, Bakker, Mooi, & Hertogh, 2016; Zidane, Hussein, Gudmundsson, & Ekambaram, 2016), but many project partners tend to lack trust and openness in project relationships (Pemsel, Müller, & Söderlund, 2016). Academia has been focusing

on highlighting the importance of project partnering, but not managed to transfer these theoretical aspects into practical settings (Eriksson, 2010).

By establishing project partners and multidisciplinary teams, the project can engage multiple participants in their respective areas of expertise. The team members are also incentivized to share knowledge and expertise with its project collaborators, based on the premise that all project partners would benefit by reaching the mutual project goals (Rogers, 2019). As a result, project partnering can positively contribute to the overall project by encouraging partners to share project risks (Pargar, Kujala, Aaltonen, & Ruutu, 2019). Previous studies have investigated both team roles, team composition, and the process inside the team to get a better understanding of what constitutes and influences team performance (Barry & Stewart, 1997; Hollenbeck et al., 2002; Pritchard, 2002). However, how teams learn and innovate is less researched, and interactions within teams composed of participants with different disciplinary backgrounds are even less researched (Schaffer, Lei, & Reyes Paulino, 2008). Thus, there is limited research on how the different backgrounds affect the overall performance (Hussein et al., 2017). Consequently, we are studying the following research question:

*How do project partnering and multidisciplinary teams influence team performance in a highly technological project?*

### **Outline of the Thesis**

In Part II, the theoretical background for the research topic and research question is presented. Part IV elaborates and clarifies methodological decisions.

Accordingly, the research approach, research design choices, and the data collection method are presented. The data analysis approach is clarified, and the ethical considerations are presented. Part V presents the findings uncovered from the data analysis. Moreover, we present five dimensions of project partnering and five dimensions of multidisciplinary teams and investigate how these dimensions affect team performance. Part VI contains a discussion of the findings. Part VII presents implications, contributions to previous research, limitations, and suggestions for future research.

## **Part II: Theoretical Background**

This section reviews previous research as well as defines the theory related to the research question. The purpose is to establish an overview of prior research as well as illuminate research gaps.

### **2.1 Project Partnering**

Project partners represent a closer relationship between the client and the contractors (Børve et al., 2017). Project partnering usually relies on crucial aspects such as teamwork, collaboration, trust, openness, and mutual respect (Black, Akintoye, & Fitzgerald, 2000; Børve et al., 2017; Hosseini et al., 2018; Larson, 1995; Lazar, 2000). Typically, project partnering represents a change in attitude and how the project is managed. Project partners are usually involved as teammates, in which they share common project goals. The joint project goals can create win-win opportunities (variable-sum game), in which both parties can benefit (Larson, 1995). In contrast to a zero-sum game, in which one party's gain is another one's loss (Ruhl & Salzman, 2019). Furthermore, project partnering represents a set of strategic actions to deliver improvements in performance (Bennett & Jayes, 1998; Børve, 2019; Jagtap & Kamble, 2019), provided by organizations to achieve detailed business objectives efficiently (Chan et al., 2004).

Project partnering provides an environment of trust and openness, to realize the project within a set time-, cost- and quality-standard (Chow, Then, & Skitmore, 2005). Moreover, an issue regarding the project partnering terminology is the vague description used to define project partnering. Consequently, the vague description leads to misinterpretation of project partnering, which leads to different practical interpretations (Hosseini et al., 2016). Yet, numerous researchers are extensively positive of project partnering, but at the same time, project partnerships occasionally turn into project failures. Therefore, there is a need for a better understanding of the concept of project partnering if we envision to fully utilize the benefits of project partnering (Eriksson, 2010).

Further, there are broad disagreements to what defines project partnering (Børve et al., 2017; Hosseini et al., 2016). There are also disagreements to what is expected from the project partners (Lazar, 2000). Without clear objectives and expectations, there might develop conflicts between the partners and the customers. As projects become more complex, research generally favors the flexibility and adaptability of project partnering, rather than formalized contracts (Wu, Zhao, Zuo, & Zillante, 2018; Wøien, Hosseini, Klakegg, Lædre, & Lohne, 2016).

Compared to the existing project, the effects of previous and similar projects are both multivariate and interdependent. Implying that incremental changes in the project process can lead to unforeseen consequences in the project outcome (Sandhu & Gunasekaran, 2004). Consequently, further research should focus on investigating the interrelations effects in the project process, as it could reveal contributing causes for project failures and success (Ajmal, Khan, & Al-Yafei, 2019). Also, considering the technological complexity and technical challenges associated with modern projects, researchers argue that radical transparency should be a requisite for handling the complexity and inaccuracies within complex projects. Because, open communication and transparency between decision-makers enable the project participants to manage inherent limits and uncertainty within projects (Droste-Franke, Voge, & Kanngießer, 2020; Owusu, Chan, Yang, & Pärn, 2020). In other words, creating formal contracts and planning every detail will rarely be feasible in complex projects. Hence radical transparency, through a mix of formalized tasks combined with contract flexibility and trust to the partners, has turned out to be relatively useful (Wøien et al., 2016).

Furthermore, an investigation of project partnering found no noticeable performance difference depending on the contractual type which was used in the project (Han, Rapoport, & Fong, 2019). However, if the relational attitudes and team working quality in the project was good, then the projects with project partners were likely to outperform the traditional contractual types. The reason is that project partnering allows single actors to utilize complementary skills they possess to tackle the problems they encounter (Han et al., 2019). However, project



partnering could also increase the management's complexity of the project, which can create challenges for project management and could lead to project deviations (Kotha & Srikanth, 2013).

Further, as the relationships between the customers and partners have been thoroughly developed over time, it reduces the extent of hard elements. Meaning that contractual details related to the project tasks are less formalized, enabling the partner to choose the optimal procedure (Strahorn, Brewer, & Gajendran, 2017). Furthermore, as the relationship between partners emerges, the soft elements such as trust and openness increase (Haaskjold, Andersen, Lædre, & Aarseth, 2019), which are necessary to form relationships between the project partners (Engebø, Skatvedt, & Torp, 2019; Strahorn et al., 2017; Wøien et al., 2016).

Moreover, soft elements represent qualitative indicators that encompass the relationship between project partners (Engebø et al., 2019). Soft elements are particularly essential in larger and complex projects, as it is challenging to predict the overall performance of the project. Soft elements, such as creating relationships and developing trust, help to establish contractual flexibility, which increases the likelihood of project success. Conversely, project disputes and conflicts impact project success and contractual flexibility negatively (Wu et al., 2018).

Project partnering emphasizes the relationship between the project participants involved. The unique capability of project partnering is the change of attitude between the organizations involved, and how they manage to develop shared goals (Bellini et al., 2016; Cheung et al., 2003). Project partnering descriptions are still somewhat inconclusive and misinterpreted, and the full potential of project partnering is yet to be fully utilized (Børve et al., 2017; Eriksson, 2010; Hosseini et al., 2016). Further, in terms of project partnering, the soft elements describe the qualitative traits that the project partners should possess. Hence, soft elements are necessary to develop a relationship and solve common goals (Engebø et al., 2019; Han, Rapoport, & Fong, 2019). Besides, soft elements are characteristics that indicate whether project partnering was successful in the project, and it can reveal

how project partnering in the past has contributed to the present project (Børve et al., 2017).

## **2.2 Multidisciplinary Team**

A team can be defined as “a small number of people with complementary skills who are committed to a common purpose, set of performance goals, and approach for which they hold themselves accountable” (Spencer, 1993, p. 101). The teamwork construct has been an interesting phenomenon for researchers and practitioners across disciplines. An explanation for this high interest is that studies have shown that successful teamwork has several benefits. Specifically, that successful teams are more likely to create innovative solutions, achieve higher motivation, and have higher task commitment (Behfar, 2019; Bradley & Hebert, 1997; Kocoglu et al., 2019; Todorova, 2019). Additionally, team members of successful teams are more likely to have higher performance levels and an increased ability to withstand stress (Bradley et al., 1997; Mazzetto, 2018; Scott-Young, Georgy, & Grisinger, 2019).

Additional studies have also investigated team roles, team composition, and the process inside the team (Right, 2020; van Knippenberg & Mell, 2020; Vaníčková, 2020). However, how teams learn and innovate is less researched, and interactions within teams with different disciplinary backgrounds are even less researched (Schaffer et al., 2008). Yet, most projects tend to include members with diverse academic backgrounds, as an initiative to achieve cross-disciplinary and cross-functional team collaboration. Besides, researchers advocate the inclusion of different academic backgrounds, as a measure to integrate the specialized knowledge and expertise held by the team members (Walden, Lie, Pandolfo, & Nemme, 2020). However, previous research has mostly focused on cross-functional teams, a group of individuals with different functional expertise that collectively work toward a common goal. A cross-functional team may consist of employees at various organizational levels and outside representatives such as suppliers, consultants, or key customers (Krajewski et al., 2005).

Studies have investigated cross-functional team performance concerning the capacity to reach the project goals, both within the schedule and within the budget. These studies suggest that organizations would benefit by establishing a cross-functional team early on (Bertoni & Bertoni, 2019; Laurent & Leicht, 2019; Wiedemann, Wiesche, & Krcmar, 2019). Moreover, empirical research indicates that the majority of organizations utilize cross-functional teamwork in their projects. Meaning that they use a project team that consists of members from different functional units with different skills, experience, and knowledge in their project, to benefit from the knowledge diversity within the team (Kristensen, 2019; Le Meunier-Fitzhugh & Massey, 2019; Zhang & Guo, 2019). Knowledge diversity can be achieved through both cross-functional and multidisciplinary teams and is regarded as a feature that enables an organization to operate in complex and confounded variable environments (Onubia, Yusof, & Hassan, 2019). Working in these environments has become more common, as projects have generally become more complicated in recent years (San Cristóbal, Diaz, Carral, Fraguera, & Iglesias, 2019). By involving different disciplines in the project process, one could potentially create a collaborative platform that enables the sharing of expertise, skills, and experiences from previous projects (Garcia-Milian et al., 2013).

If a project team is composed of members with diverse background expertise and skills, then the team is considered multidisciplinary (Hussein et al., 2017; Krajewski et al., 2005). Consequently, the distinction between cross-functional teams and the multidisciplinary teams is that multidisciplinary teams focus on the variation of the disciplinary backgrounds of the team members. In contrast, the cross-functional team focuses on the variety of functional expertise of the group members (Krajewski et al., 2005). Furthermore, in this study multidisciplinary team is used to describe decisions that are shaped by the personal and professional values and assumptions held by the involved project participants. However, we focused on multidisciplinary teams in this study. A multidisciplinary team is a group of people who work together towards common goals by sharing their understanding of the subject (Haines, Perkins, Evans, & McCabe, 2018). Moreover, we used the multidisciplinary team terminology to build an

understanding of the power dynamics of knowledge and responsibility between the project participant (Haines et al., 2018).

It is suggested that organizations would benefit from engaging in multidisciplinary teams with the focus on reaching organizations' main goals, as more disciplinary backgrounds can assist the flow of valuable information and incentivizing knowledge exchange (Hausberg & Leeftang, 2019; Parkman, 2019; Sethi, Smith & Park, 2001). It is also generally acknowledged that team size should vary in relation to the task complexity, as well as regarding the scope and scale of the project (Laurent et al., 2019). Consequently, the multidisciplinary setting creates a framework for collective thinking, which facilitates collective learning where the team members are able to share and learn by viewing things from different perspectives (Pennington, 2008). Different perceptions encourage discussion and facilitate theory creation by utilizing the knowledge base of its participants, without restraining the idea generation to a distinct paradigm. Consequently, enabling the participants to elaborate and extend on each other's knowledge (Harder, Burford, & Hoover, 2013). Thus, project participants can solve problems more efficiently, utilizing the different competencies possessed in the project (Droste-Franke, Voge, & Kanngießner, 2020; Owusu, Chan, Yang, & Pärn, 2020).

### **2.3 Measuring Team Performance**

The narrow measurement tools for assessing team performance have created a divided team performance assessment approach between scholars (Ancona & Caldwell, 1992a; de Moura Jr & Bellini, 2019; Georgiou, 2003; Johnson, 2001; MacKinnon, Pukk-Härenstam, Schwarz, Kennedy, & Stenfors, 2019). Team performance has various interpretations, and we have chosen to define team performance as “the extent to which a team is able to meet its output goals (e.g., quality, functionality, and reliability of outputs), the expectations of its members, or its cost and time objectives” (Kostopoulos, Spanos, & Prastacos, 2013, p. 1437). Typically, when assessing team performance, some scholars focus on financial indicators, while other scholars focus on internal factors within the team (Yin, Xiong, & Kou, 2019). When assessing team performance, researchers

generally include as many contributing variables as possible, since omitted variables could invalidate team performance measures (Hackman, Walton, & Goodman, 1986).

Similarly, in this thesis, we have attempted to include several contributing variables. Consequently, we investigated the reported group processes in the project, as well as comparing objective project outcomes with the scheduled outcome, to determine team performance. The inclusion of different data sources is a measure to account for the lag effect between group process and group performance. This lag effect is important to take into consideration, as it implies that the current performance cannot be assessed by interpreting the ongoing group process (Ancona, 1986; Bettenhausen & Murnighan, 1985; Gonzalez-Mulé, Cockburn, McCormick, & Zhao, 2020; Hackman et al., 1986). Based on quantitative and qualitative considerations, we describe team performance as the degree to which a team is capable of meeting their objectives in the form of quality, functionality, and reliability, as well as whether the team members are able to meet the expectation of its team members, and ready to stay within the projected costs and time window (Hoegl & Gemuenden, 2001; Kostopoulos et al., 2013; Larson et al., 2019; Samarasinghe & Samarasinghe, 2019). Additionally, team performance is dependent on the circumstances of the project. So, if project uncertainty is high, then the project team is encouraged to adapt to environmental changes more efficiently. As a result, routines would be less prioritized because the project team focuses on adapting to the external changes (Lai, Hsu, & Li, 2018).

Furthermore, in research, there is a broad consensus that team performance, together with team satisfaction, and team viability, constitute the dimensions of team effectiveness (Cioca, Fodor, & Marlow, 2019; Rus & Băban, 2019; Schott, Keathley, & Krejci, 2019). Team effectiveness is the team's capacity to achieve goals or objectives, while team performance reflects the team's outputs compared to the standards set by the organization (Aubé & Rousseau, 2011). In practice, team performance determines how well the team executed their assigned tasks (Aube & Rousseau, 2005; Hackman, 1987; Sundstrom, De Meuse, & Futrell,

1990). One way to measure team performance is to attach team performance to project success or focus on the financial outcome of the teamwork (Yin et al., 2019). Another method is to measure team performance by analyzing internal dynamics in the team, by investigating group-specific traits, for instance, whether the group members trust each other (Gay, Horowitz, Elshaw, Bobko, & Kim, 2019).

We have focused on internal dynamics, as it describes how the group is sharing information and interacting in the team and whether the team is proactive with outsiders. This qualitative approach may determine if team members share relevant information with both internal and external participants, as well as seeking information, interpreting signals, and ensuring adequate resources (Ancona & Caldwell, 1992b). Furthermore, considering internal dynamics, team performance can also be evaluated on behalf of team members' belonging to the project team, and the capability of the members to interact in future projects (Hackman, 1990; Tabassi, Roufechaei, Bakar, & Yusof, 2017). The interaction is important for team performance, because team members' ability to create enduring interpersonal relationships, could reinforce the quality and process of forthcoming projects (Tabassi et al., 2017).

### **Part III: Research Context**

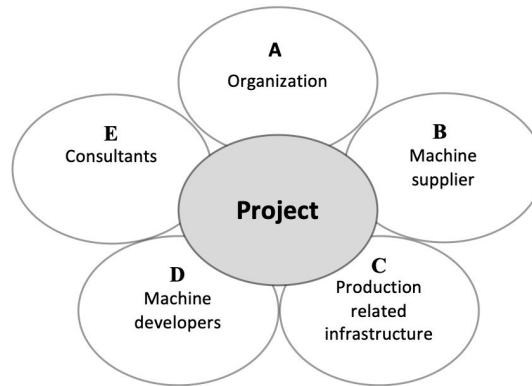
The organization represented in the case is a family-owned company established in the 1970s, referred to as the “Organization”. The Organization is a large service provider for the Norwegian market, which has experienced rapid growth in the last two decades. In 2018, the Organization had gross revenues of over one billion NOK and more than 1000 workers. Further, the high labor costs in Norway have created incentives for the company to innovate and automatize its production as an act to maintain its competitiveness in the Norwegian market. Over the years, the company has focused on cooperation and knowledge sharing with its suppliers, since they are dependent upon these suppliers to create new facilities, as well as maintaining their existing facilities. This interdependency between the company and its suppliers has resulted in the formation of an informal cooperative project partnership between the suppliers and the company.

Our case study focused on one specific construction project, which became one of Europe’s most advanced, environmentally friendly, and efficient facilities, offering new methods of producing their specific services. The project lasted for approximately one year and operated with a budget of 140 million NOK. The facility was completed in 2018, and we conducted a post-investigation on how project partner and multidisciplinary team influenced the project.

The project overall was two-folded. Construction of the building itself, and then building the infrastructure inside of the building according to the business purposes. However, we would not consider the contractors building the facility to be project partners, based on the formal approach that was applied between the Organization and the contractors. The focus of this study was, therefore, mainly directed toward the inner construction project, which was handled in cooperation between the project partners and the Organization. The Organization and the project partners were engaged in the development and installation of the business purpose related infrastructure.

Figure 1 illustrates the project partner relationships, where the focus was primarily on the grey area, represented the project interactions between the project partners. We have interviewed individuals representing both the Organization (A) and individuals representing the project partners (B-E).

**Figure 1. Research focus.**





## **Part IV: Methodology**

In this thesis, we have utilized a case study research design, with an abductive research approach building on iterative reasoning, going back and forth between theoretical concepts and analyzed data (Walsham, 1995). Furthermore, we applied semi-structured interviews as it fits well with the abductive research design. Collected data was analyzed continuously and evaluated against theoretical concepts. By doing so, we adjusted the interview guide based on the interviewees and what we wanted to explore further. The data analysis applies coding of interviews to understand the social world of the interviewees and to compare data to theory. To extract the most from the interviews, we developed a description of what we were looking for, but we also emphasized that our research aim was to provide useful insights and encouraged honest and unconventional answers from the interviewees.

### **4.1 Abductive Research Approach**

In research, the two dominant research approaches are inductive- and deductive reasoning. Briefly, an inductive reasoning approach is a scientific research approach in which the researcher uses observation to generalize and create theories, whereas the deductive reasoning approach is when researchers use theory to generate predictions and test theories empirically (Bell, Bryman, & Harley, 2019). Our research approach was a combination of these two concepts. Meaning that we were using an iterative process known as abductive reasoning, a reasoning process that both formed and evaluated exploratory findings, to find inference to the most plausible explanation (Bhagavatula et al., 2019). An abductive inference approach fitted our research well and allowed us to conduct interviews in which we engaged interviewees in a collaborative conversation. Here, we decoded verbal language and body language by applying logic and reasoning behind the data extracted from the interviews (Arrighi & Ferrario, 2008).

Additionally, we decided on the criteria for what constitutes valid knowledge because this epistemological consideration determined our focus when studying the social world. The scientific approach thereby created the foundation for the research process and how the research was conducted (Bell et al., 2019). The

inductive research approach usually applies an interpretive epistemology approach, meaning that the researchers utilize an interpretive lens to process multiple perspectives on the same truth and subjectively view the research process (Nowicka & Ryan, 2015). In contrast, a deductive research approach usually applies a positivist epistemology, meaning that the researcher views the truth as objective and empirically derived from observation facts and data (Xinping, 2002).

Our epistemology combined the inductive and positivist method of inquiry, into an abductive science inquiry approach. We both generated assumptions based on theory and observation (Råholm, 2010), as well as utilized critical thinking in the interpretation of these phenomena, which we observed (Oh, 2011). An abductive science inquiry research approach would thereby enable us to engage in a dynamic, iterative process. Meaning, we can collect and analyze data to establish an initial theory, then we can collect further data to revise the theory and expand it, or abandon the initial theory (Walsham, 1995).

#### **4.2 Research Design and Data Collection**

For this study, we applied a case study research design. This research strategy provides an in-depth exploration of a phenomenon involving a variety of data sources. Different data sources reduce the risk of bias by exploring a certain case with different perspectives (Baxter & Jack, 2008; Eisenhardt & Graebner, 2007). We studied how project partnering and multidisciplinary teams affected team performance. The research strategy was, thereby, a conscious decision taken to most accurately answer our research question. The case study research design enabled us to gather rich descriptions of different relatable perspectives, from different individuals. The perspectives represented real-world contexts where these relationships were not fully explored (Yin, 2011). The benefits of the case study research design provided a more vibrant picture of the reality and widened our understanding of investigatory concepts (Dubé & Paré, 2003). Besides, real-life situations increased the ecological validity of our study, which made our findings more applicable to practical settings. Furthermore, the case study research strategy was particularly compliant with our research question, as it

provided rich data from natural settings, which allowed us to generate theories from these settings (Benbasat, Goldstein, & Mead, 1987).

Data collection was conducted mainly through semi-structured interviews. Semi-structured interviews imply that we did not follow a strict and formalized set of questions, but instead focused on facilitating the discussion by giving open-ended questions to the interviewees (Runeson & Höst, 2009). Further, the semi-structured interviews were an appropriate collection method, since we were using abductive reasoning in which we wanted to explore beyond our predetermined expectations. Asking open-ended questions and following up on exciting paths during the interviews enabled abductive reasoning (Barriball & While, 1994).

Moreover, semi-structured interviews helped to explore more deeply into emerging and surprising data provided by interviewers or interviewees (Gill, Stewart, Treasure, & Chadwick, 2008). We presented the interview guide to the interviewees in advance, to prepare them for our expectations and provide useful insights into our research area. Besides, we tried to describe our study in a way that the interviewees could evaluate whether they were fitting in our research project, or not. Nevertheless, we wanted to bring a detailed description of our project expectations to extract the most out of these interviews. Therefore, our main criteria were that the interviewees were involved in the project. We purposely did not set a required minimum of involvement since we wanted to include a large variety of people with different levels of involvement.

Regarding our sampling, we chose to collect data from a building project undertaken by relatively small industry. The reason being that this organization was highly dependent on a small number of suppliers since their industry-specific machines were provided by only two different suppliers. Also, there were instead few suppliers specialized in developing machines, offering consultancy, as well as building-related infrastructure in this line of industry. These factors incentivized project partnering cooperation and made this project suitable for investigating project partnering and multidisciplinary team effects on team performance. We

conducted 15 semi-structured interviews with key stakeholders in the project. In which eight of the interviewees represented the Organization, while seven represented the project partners. Some of the interviewees were more engaged in the project than others, but the perspective diversity was necessary to reduce bias in our sampling. Thereof, the selection was part of our abductive research approach, where we established theories and then tested these theories in an iterative process (Walsham, 1995). Furthermore, the interviews were recorded and transcribed. The average length of the interviews was 42 minutes.

While gathering new data, we applied triangulation in our data collection by seeking other sources for information. Applying triangulation in data sampling improved the integrity and reduced bias in the data collection (Dubé et al., 2003; Jonsen & Jehn, 2009; Leech & Onwuegbuzie, 2007). These sources derived from semi-structured interviews, a post-project meeting, and a previous academic project related to this particular project. Also, the complimentary questions and conversations contributed to the iterative process, where new insights and perspectives were uncovered and explored. Our intention, when using abductive reasoning, was to ensure a continuous process of collecting and analyzing data, to establish a theoretical concept through semi-structured interviews. Therefore, we collected continuously more data to discuss whether these theoretical concepts hold, through additional interviews, questions, and conversations (Walsham, 1995). The research process was conducted by the three sequences abductive approach, evaluation of literature, data collection, and data analysis (Timmermans & Tavory, 2012). The sequences were dynamic, meaning that each sequence could be used interchangeably, but was dependent upon the iterative reasoning process.

Table 1 and Table 2 illustrate the project interviewees, their positions, tasks, and academic backgrounds. The tables provide a structured view of different stakeholders in the project. Table 1 shows the interviewees within the Organization, while Table 2 shows a sorted list of the project partners in the project. The interviewees were anonymized, sorted, and numbered, as seen in the first column. The letter in the first column represents the role of the involved

participant in the project, and the numbers are given to each individual included in the study. The first column, “A” implies that the individual is hired from the Organization, while B-E are external project partners, who have worked on projects with the Organization for several years. The interactions between the Organization and the project partners in the project is illustrated in Figure 1.

**Table 1: Informants Within the Organization**

	<b>Organizational Position</b>	<b>Project Position</b>	<b>Main Task</b>	<b>Academic Background</b>
<b>A1</b>	Development Director	Project Owner	Responsible for the overall project, and reports to the board of directors	Certificate of Apprenticeship in the Industry
<b>A2</b>	Chief Executive Officer (CEO)	Stakeholder	Formal responsibility	Master of business administration
<b>A3</b>	Operation Manager	Facility chief	Implement and then ensure daily operation	Aircraft Mechanic and Technician
<b>A4</b>	Project Coordinator and *QHSE	Project Coordinator	Manage, accounting and administrative tasks related to the project	Certificate of Apprenticeship in the Industry
<b>A5</b>	Chief Operating Officer (COO)	Stakeholder	Ensure that the project is followed-up and managed correctly	Leadership and Executive Education
<b>A6</b>	Senior Consultant	*QHSE Consultant	Ensure optimal control and coordination related to the central operating monitoring system.	Education and Experience from Energy Technology.
<b>A7</b>	Department Manager	Employee	Production implementation	Bachelor of Science in Criminal Justice
<b>A8</b>	Chief Human Resources Officer (CHRO)	Responsible for Hiring	Ensuring adequate employment in the facility	Coaching and Relationship Management
<b>*QHSE - Quality Health, Safety and Environment</b>				

Table 2: External Informants

	Organizational Position	Project Position	Main Task	Academic Background	Project Partner Role
<b>B1</b>	General Manager	Machine provider	Ensuring implementation and assembly of machines and equipment	Skilled Worker	<i>Machine Supplier</i>
<b>C1</b>	Engineer	Consultant	Implementation advisor	*M.Sc. in Mechanical Engineering	<i>Installer of Related Infrastructure</i>
<b>D1</b>	Chief Executive Officer (CEO)	Machine developer	Create, and deliver requested autonomous solutions	Software Engineer, and **B.Sc. in Electrical Engineering	<i>Machine Developers</i>
<b>D2</b>	Project manager	Project manager	Implement autonomous solutions	Electrician and B.Sc. in Marine Engineering	
<b>D3</b>	Chief Technology Officer (CTO)	Machine developer	Ensure the correct design and functionality of the autonomous system	Ships Officer and B.Sc. in Marine Engineering	
<b>E1</b>	Consultant	Project manager	Strategizing and quality assessment of the project	*M.Sc. in business administration and Certified IT Accountant	<i>Consultants</i>
<b>E2</b>	Consultant	Consultant	Ensuring that the best possible hygiene and technological solution is applied	Skilled Worker	
*M.Sc. - Master of science **B.Sc. - Bachelor of science					

### 4.3 Data Analysis

In the data analysis, we applied a research method known as grounded theory. The method provides a set of procedures for shaping and processing rich qualitative data. Grounded theory is recognized by the simultaneous process of combining the research process with theoretical development. In practice, we developed theoretical concepts based on collected data (Charmaz & Belgrave, 2007; Glaser & Strauss, 1967; Walker & Myrick, 2006). Grounded theory is particularly relevant as it seeks to clarify how the subjective reality for each individual is perceived (Suddaby, 2006). Furthermore, we create a theoretical and practical understanding of how academia and qualitative data concur. The benefits from grounded theory enabled us to better understand the subjective world of the individual by collecting rich personal data and construct theories regarding these rich data sources (Walker & Myrick, 2006).

There are multiple steps in the data analysis. First of all, we had background information of the Organization through a previous project conducted in this particular Organization and facility. Consequently, we were aware of how the Organization operated and what roles the project partners had in the project. Also, we were allowed to attend a post-project evaluation meeting with the project team. The meeting reflected the aftermath of the specific project, intending to analyze and uncover potential improvements in the project approach. Using alternative sources of data allowed us to develop and refine new ideas of collected data. Observing the project team in different contexts helped us get a deeper understanding of how team performance unfolded. The use of supplementary sources was a measure to ensure triangulation in our data collection, to strengthen the result, and make the findings more reliable (Dubé et al., 2003).

Further, after collecting data from semi-structured interviews, coding of the transcripts was conducted with regards to grounded theory. We applied two types of coding; open coding and axial coding. Open coding involves breaking down the data and provide new insights by comparing certain events with similarities or differences. Axial coding breaks down categories into subcategories and tests these concepts against additional data (Corbin & Strauss, 1990; Vollstedt & Rezat, 2019).

Open- and axial coding was especially relevant for the study as it provided useful insights and broke down certain common aspects to develop new theoretical concepts. Subsequently, we tested new theories through rich data sources, such as interviews and conversations with other relevant individuals. Data samples from transcripts and complementary dialogues enabled us to evaluate the interviewees' reality carefully and allowed continuous adjustments to initial theoretical concepts.

Lastly, we applied abductive reasoning by conducting a continuous iterative process where data was analyzed and evaluated against academia. Initially, we sorted the data into groups of interest. Therefore, we applied key dimensions of team performance for this specific project. Subsequently, we conducted a data analysis of the first data collection. We analyzed and adjusted the upcoming interviews by the abductive inquiry approach (Corbin et al., 1990). During our abductive inquiry analysis, we uncovered several findings which formed the basis of this thesis. We have, therefore, structured the thesis in congruence with Table 3, which shows the recurrent categories we uncovered through our data analysis. The following data collection and analysis are presented logically, where the most relevant findings are presented in Part V.

Table 3 constitutes the structure of Part V since these categories were the most prominent factors related to our research question. Moreover, Part V follows the logic structure of Table 3, where the findings of project partnering are presented, followed by multidisciplinary teams, and team performance.

**Table 3: Categories**

<b>*PP influence effect on team performance</b>	<b>**MDT influence effect on team performance</b>
Trust and openness	Sharing of knowledge, skills, expertise, and experiences
Top management support	Specialized knowledge
Shared goals and motivations	Solution rationalization
Attaining the right people	Knowledge diversity
Responsibility and accountability	Different perspectives
<b>*PP - Project Partner</b>	
<b>**MDT - Multidisciplinary Team</b>	



#### **4.4 Ethical Considerations**

As of January 1st, 2020, we received approval from the Norwegian center for research data (NSD) to collect data from interviews. We also distributed and ensured that the interviewees agreed to the informed consent. However, we focused on minimizing personal information to create an open and safe environment where the interviewees were encouraged to share their insights and experiences without risking adverse consequences. For that reason, we chose to refrain from using full names and other information, which would make it easy to recognize the individuals' identity.

Furthermore, we followed the ethical appropriate guidelines to ensure that confidentiality and anonymity guidelines were taken into account. Also, we informed the participants that they could withdraw from the study at any time, and if such withdrawal were reported, we would respect the decision and extract the interviews from our research. The interviews were recorded using a recorder in congruence with the GDPR (General Data Protection Regulation) guidelines. Afterward, the soundtracks were transcribed and subsequently deleted. After the master thesis is finished and submitted, we will terminate the transcripts as well.

## Part V Findings

This chapter presents the findings from the data analysis. Our focus was directed at the construction- and implementation phase of the project. Thus, the chapter is structured similar to Table 3 in the methodology section. The main two categories, project partner and multidisciplinary team, are separated. Further, the main findings are presented separately as subcategories within the project partner section and the multidisciplinary team section. Finally, the influence on team performance is presented.

### 5.1 Project Partnering

We uncovered early on that the project had numerous project managers, where the organizations which participated in the project usually appointed their project manager. Furthermore, the interviewees had a clear understanding of their assigned tasks and responsibility, as well as to whom they should contact if they encountered any issues. However, since a considerable degree of the project participants were assigned the title as the project manager, it was hard to identify the overall project manager. In contrast, it was relatively easy to identify the project owner.

*"AI was the project responsible but hired me as a project manager to keep progress and structure in the project. But I know that you will interview quite many who have the title project manager.,and that is how it is. They are indeed the project managers. For example, the building contractor has an appointed project manager, which indeed is a project manager who manages all sorts of things. Also, you have a project manager for all kinds of different disciplines. However, that is not the project that I managed. The project I managed was organizing, staffing, training, and everything that has to do with organizing and running a new facility." (E1)*

### Trust and Openness

Conceptualizing social dimensions, such as trust and openness, are difficult. Although every individual attains some level of trust and openness, these are

presented here because these dimensions had value to the project. We saw incidents where these dimensions were applied and provided value to the project.

*"Working with the Organization and the machine supplier, it is a little more openness about the challenges we see along the way, such as deviations. While being a little more cautious in meetings with the contractor and the builder. At least, before we know how to handle a discrepancy. We might hold back a bit there. So, there is a lot more open communication between those who are on one side of the table than those on the other side of the table." (C1)*

Talking to the interviewees, trust was a frequent topic. The Organization and its partners had, through years of relationships, developed an understanding of how each party performs in similar projects. The strong relationships between the project partners and the Organization constitute the fundamentals for trust in this project (A1, B1, D1, D2).

*"We participate from day one. A1 calls me and says that the board has decided that we should create a facility, then the process begins. Then we gather production figures on what they intend to produce. Then it is our job to calculate and find what kind of machine and material flow is needed to get the best possible solution so that there are as few people as possible in the production [...] We challenge the Organization, and the Organization challenges us. This is usually a process that generally takes one year. Eventually, a sketch proposal emerges, so the Organization makes its assessments and tries to find logical flaws. Then we make changes, and finally, we have a solution we believe in. Then the price negotiations start, and we start for real." (B1)*

The interviewees mentioned trust as a tool to achieve project goals throughout the project. We saw incidents where a high level of trust was applied in the project, and the particular project approach would not have been possible without trust between the project partners (A1, A3, A4, D3, E1).

*"We have spent a lot of time on this project to make sure it works properly. There was no detailed requirements specification. I doubt that you will be able to find such a detailed requirements specification today. [...] I think that is because A1 has faith in us, and trust that we will deliver." (D3)*

A typical event through many interviews was how the high level of trust transferred back and forth as a continuous process through the project. If certain circumstances came up that made the project more challenging, it was not required to inform everyone involved in the project, as these problems could be solved by the respective project partner (A1, B1, D3).

*"When communicating with the Organization, A1 is most frequently involved. He attains a high level of knowledge and formulates clear expressions. This is very easy to cope with, but it almost has to be this way. [...] If we experience deviation in our progression, I deal with this internally with my supervisor, and then we find a solution. Minor things are dealt with internally, and do not need to be shared with other project partners." (B1)*

Combined with trust, the interviewees often mentioned openness. For both the Organization and the project partners, openness was highly valued and seen as a capability for project success. Especially internally, openness was endorsed among the interviewees, even though transparency could expose one self's lack of knowledge or accomplishment (A1, A3, A4, E1, E2).

*"I am not a typical project manager. I run the projects, and I am quite authoritarian in managing them. But I have people with me who tell me if they disagree. I have talented people with me who dare to ask stupid questions. We make each other better. People come up with things that others have not thought of previously [...] One will not be labeled as a fool if one makes a small mistake." (A1)*

Moreover, both the Organization and project partners had a clear understanding of each other on how to perform and create a group mentality in which everyone serves a purpose in the project. This mentality might explain the high level of openness within the project (A1, A4, E1). Moreover, we noticed that the Organization also had an open approach toward innovation and optimization of their procedures.

*“The Organization is very open-minded about new things and new technology, and they are willing to take a risk. In this project, they took a concept that had not been tested before, and when they tried to apply it to a brand-new facility, even though they knew that the facility had to deliver the highest volume in the entire company. The decision to go for this concept is based on trust, mutual trust. It also builds on our willingness to take risks [...] The Organization is very proactive in terms of developing new technology, and they are very open-minded to new solutions, which is an aspect that I value pretty much.” (E2)*

Further, communication and coordination were crucial in this project. Good communication was often related to the effective flow of information to the right people. The effective stream of information made rapid changes possible (A3, A4, A7, B1, D1, D2, D3, E1).

*“Something very important for me is that changes should be cheap. We should always try to make the organizations so that changes are cheap to make. Because if changes are expensive to make, you don't make the changes.” (D1)*

As a result of trust and openness, the project partners could maintain contractual flexibility, where communication happened in a continuous loose and unstrained manner (A1, A3, B1, C1, D1, D3, E1).

*"We have spent a lot of time at the facility to make it work optimally. There is no requirement specification in detail. I think no one can find such a specification today. That is because A1 has confidence that we deliver, and that is our goal [...] We have several customers where we can write the requirement specifications on a 'napkin.' "Organization" is one of them. It goes both ways. If there is a customer we do not know, the documentation requirement is higher." (D3)*

### **Top Management Support**

The Organization was part of the project in different ways, most evident from the involvement of A1, which was both shareholder and member of the board of directors, but also the overall project manager and project owner of the project. Furthermore, it became clear during the interviews how the Organization structured their project team and what role the top management played in the project (A1, A3, A4, C1, D1, D2, D3, E1).

*"I am both the project manager and the project owner in this project. I have a responsibility towards the top management and the board of the Organization. Also, I have the responsibility for progress and controlling the project development. On that basis, I will conclude that I possess a hybrid role. There is no clear line between the project manager and the project owner in this project. However, I cannot do everything, so I have distributed some of the tasks to my colleagues." (A1)*

It was reported that A1 had the overall responsibility and that A2 had formal responsibility in the project. The Organization did not employ one distinct project manager to overlook the whole project. Instead, A1, which represented the top management, was heavily involved and distributed tasks to his colleagues (A1, A2, A3, A4, E1).

*"From the time we agree to carry out the project, I start reporting about the project process on board meetings. How is the project progressing? Is it in accordance with the agreement? Are there any deviations? This*

*process continues when we start building. There are always things that happen, and it is my responsibility to inform [the board]. I am the project manager, and when we finish, I sit here for a year to show that I can deliver the results. "One has the head on the block" all of the time; one does not just become free. One cannot deliver completely different results half a year after completion and try to explain oneself out of it. It does not help. It is very easy to see through." (A1)*

However, A1 had to stay within the project mandate given by the CEO and the steering board, significant exceedances would lead to a re-evaluation of the project. Considerable deviations from the project plan would require A1 and A2 to defend the discrepancy to the board of directors (A1, A2).

*"One may well discuss who is the project owner here, but the string is that it is A1 who is responsible for carrying out the project. He is given a mandate decided by the board of directors. It does not mean that I am out ruled: it is I who put the matter to the board. I am formally responsible for presenting the plan to the board [...] If the one who is given a project exceeds his mandate or if there have been significant changes, then he will come to me. Then I will assess whether the crack is large enough for it to go to the board of directors." (A2)*

The top management used a fairly agile involvement strategy where they were involved only when necessary. Besides, some interviewees struggled to describe their tasks using formal job titles. However, there was a diverse set of tasks that were to be executed, and the interviewees knew their roles concerning these tasks. Furthermore, the people involved were usually self-driven, aware of their individual tasks and responsibilities, and contributed to the project's completion (A1, A4, E1, E2).

*"I'm self-driven, I'm sitting [organizationally] under A5, but it's not like he calls me every Friday and tells me what to do. I plan my week and go where I know there is a need for my expertise." (E2)*

Further, A1 prioritized to be heavily involved to ensure control and project success. There were relatively few people involved representing the Organization, but the ones involved usually had great experiences from previous projects. Besides, the top management emphasized the use of expertise and experience and did not develop detailed job descriptions for those involved (A1, A4, C1).

*"It's not quite typical. I was the one with the thread in everything. I was the project manager. A4 was the right-hand that I used to systematize the project. Then I used E1 for the entirety of the project." (A1)*

### **Shared Goals and Motivations**

The interviewees explained their performance beyond experience and emphasized their desire to achieve success in what they do. The people's experience and mindset were unique for this project. Project participants thrived working with skilled colleagues and achieving goals and were, therefore, engaged in new, forthcoming projects (A1, A3, A4, E1, E2).

*"I use the same people for our projects. We are used to the collaborative team setting. And we know what is expected and what we ought to execute in our projects. Besides, they [the team members] perform at a high level." (A1)*

Various interviewees pointed out the innovative solutions the Organization utilizes to maximize project outcomes. These new solutions were a strong driver towards creating a unique project and motivating those attending in the project to perform alongside it (A1, A3, B1, D1, D2, E1).

*"What is especially unique for this project is the usage of innovative creations and processes in production. A1 and B1 have spent a lot of time traveling across the world for new ideas on how to reduce the production inputs." (A3)*



The continuous process of improving and finding new ways of doing business have been frequent topics in the interviews. Both engaging the Organization and project partners were important to develop and pursue common goals for all involved. Having a challenging project, yet achievable, made people thrive on finding solutions and solving the tasks ahead. To do so, skilled and professional colleagues were essential (A1, A3, B1, D3, E1, E2).

*“We do have a close relationship with our project partners in terms of expectancy. I believe much of our success originates from the fact that we have been in this business from an early age. We are not an organization where people outside the company just simply come in and do a job. We sleep poorly at night if the project does not meet our expectations.” (A1)*

Overall, we can see a clear motivation toward improving the industry in which the Organization is operating in. Here, the involved participants used a macro perspective on their everyday work (A3, D1, D2, E2).

*“I always say go out of the building, meaning go out into the facility and look at what the real problems are, and discuss with the owners and the managers of the particular facility. What can we do to make it a better place to work? That is my main motivation. We also say remove the dirty work, because there is a lot of bad working environment in this industry if you look at it all over the world. It's a noisy and often nasty working environment [...] At the end of the day, we call ourselves [industry] nerds. We love to work in this industry, but we are also nerds. So, we are also fascinated by technology [...] At the end of the day, I think people are motivated by making the world a better place.” (D1)*

Furthermore, the interviewees described an inclusive project culture with primarily team orientation (A1, A2, A3, A4, E1, E2).

*"I think the culture is characterized by great desire and commitment. A motivation to get things done and to create teams that work well together, such as in these sub-projects." (A2)*

### **Attaining the Right People**

Determining the working environment and culture in the project, we uncovered that most of the project participants had long experience working together. Further, we saw that these participants had a clear understanding of the best project approach and that they adapted to this project approach accordingly (A1, B1, C1, D1, E1).

*"The way we have run projects for the last 15 years is that I team up with E1 and define the workload and assignments that should be conducted. We've done this before. We set goals, milestones, and clarifies, who's going to what? Only this job takes weeks or months. Here, we define the challenges. Typically, we have the HR-department, the construction process, and which type of building one should have, but we also have the IT-department: One must get in the right people at the right time of the decision-making process. I would say that this arrangement has worked very well in our latest projects." (A1)*

Furthermore, the Organization had attained the right people to their project team through previous projects. These individuals were, therefore, included in this project as well.

*"I use the same people for our projects. We are used to working in a collaborative team, and we know what to expect and what to execute in our projects. In addition, they perform at a high level." (A1)*

We also noticed that the project participants adapted to complement each other's expertise during previous projects, which seems to be one of the success factors in this particular project (A1, A4, E1).

*"A1 and I have been running such projects for 15 years now, so we have a unique project approach. He has the [industry specific] expertise, and I am kind of the project manager type in the project. So that's my involvement in the project. Taking the sketches from a board meeting case and turning it into a project plan, followed by approximately one year of meetings and progression." (E1)*

The organization's employee turnover rate was very low, meaning that a considerable amount of the employees had grown together with the Organization (A1, A3, A4, A5).

*"We have very few people who leave our company, so most of the resourceful individuals have been with us for years." (A1)*

### **Responsibility and Accountability**

The structure of responsibility and accountability was usually implicit within the project team. The interviewees shared different views of the specifics of their responsibility and accountability, however, they had different project categories where they were responsible. Nevertheless, A1 had a considerable degree of dedication towards ensuring that the result was in accordance with the project plan (A1, A3, A4, C1, E1).

*"Although A3 was the operating officer at the end of the project. In practice, it was I who managed the operation. The reason for that was that I knew how the facility was built and what challenges we might face. It would not have been favorable to transfer all the responsibility to A3, who was not involved to the same extent. That was why I had close follow-up after the construction ended." (A1)*

Rather than developing a detailed list of objectives and responsibilities, various interviewees maneuvered more on intuition and by helping each other to solve the tasks ahead (A1, A3, A4, E2).

*“We are not obsessed with defining our project roles. I think it is a positive feature of the way A1 and I, are working together. We are not reliant on a detailed list of what we are supposed to do. I prefer it to be diffused, and rather deal with things when it occurs so that we avoid static areas of responsibility. I believe this works best in practice, otherwise, it would involve too many people.” (A4)*

The interviewees explained the high level of flexibility and intuition as a result of a high level of trust, which affected the relationship of responsibilities and accountabilities (A4, D3, E1).

*“There is not that important to create detailed project plans and instructions to everyone involved. This is maybe a bit untraditional in general in these types of projects [...] Other organizations would probably have involved a lot more people and, to a higher degree, used detailed governance, for a similar project. I think we have solved this in a rather simple way [...] I believe that we have found a balance for involving people, where we focus on the things that matter. I think that many tend to govern too detailed in these types of projects.” (A4)*

Overall, we saw a clear trend toward employee empowerment, where things were more related to adhocracy to ensure efficiency (A1, A3, A4, A5, A6, A8).

*“We are very clear about the fact that we are a large organization, and that all issues cannot be solved here [at the main office]. It must be solved locally when possible. That is the general rule. If someone does not reach the goal or if there is a conflict, I will be connected.” (A8)*

## **5.2 Multidisciplinary Team**

Our analysis found that there was a positive attitude toward innovation and progress, where improvement from various disciplines was utilized.

*"There are opportunities with these technologies, and that's partly what I bring into the Organization. It's my experience and my way of being with people. In my opinion, I find myself coming in and gaining the confidence of the various people in the Organization." (E2)*

### **Sharing of Knowledge, Skills, Expertise & Experiences**

Interviewees expressed a mindset that strives to improve personal performance and enhance others (A1, A3, D1, D3, E1, E2).

*"It is important for me that those who do not write in everyday life, manage to write in the document I provide them. These materials look very simple, and that's the whole concept. It's very banal and straightforward. Many project tools are much more advanced, but these project tools wouldn't be suitable for these individuals." (E1)*

Furthermore, the interviewees shared their personal stories of how and why they became involved in the business, and what motivated them. A commonality in these stories was that they were motivated toward mastery, making progression and being of utility to others (A1, A3, A4, B1, D1, D2, D3, E1, E2).

*"I was born and raised in the industry. So, I know the subject, but I have to listen to other competencies along the way. I wasn't used to that before. 15-20 years back in time, we just started building; we just did it! There was no big organization around us. However, this has changed. I have become better at delegating, collaborating, being a team player, and structuring." (A1)*

In this project, we saw initiatives to empower the project participants. There was a balance between asking for assistance and suggestions, but it was also an opportunity to disengage when necessary. Furthermore, we noticed that the activity plan was designed to create motivation and ownership. Hence, the activity plan was designed so that the project participants could contribute with their unique touch and insight.

*“I have a dialogue with the involved parts and adapts it so that they feel ownership of the activity plan [...] It does not help that the consultant is great; you have to make the project participants internally great. They are the ones that have to solve their tasks, not us. We will succeed if they succeed.” (E1)*

### **Specialized Knowledge**

It became evident that the interviewees overall had substantial specialized knowledge. One way to determine this was the years of experience in the business. Even though years of experience do not determine how well an employee performs, it was at least a clear relationship between expertise and years in the business (A1, A4, B1, E1, E2).

*“I have no academic education, but instead 30 years of experience in this industry [...] I started as a supplier in the late 1980s and has done this ever since. My experience, the experience held by A1 and everyone else involved in the project team, enables continuous contributions. Without experience, it would be impossible to conduct a project like this one.” (B1)*

Considering the interviewees' academic backgrounds, a few highlighted their formal education as an advantage in the project (C1, D1, D2, D3, E1). However, several mentioned that they managed only to use minor parts of their education into practical settings (A3, A7, E2).

*“When it comes to expertise in terms of academic background, it may not be the essential component for success in a project such as this one. I believe experience and understanding humans are more important.” (A4)*

Further, the interviewees' general opinion was that experience was the decisive factor that mattered for completing the project (A1, A3, A4, A7, B1, E1, E2).

*“A1 had the overall communication with the different partners and contractors in this project. I do not have the necessary knowledge to build the facility. This is where the expertise of A1 comes in. All communication goes through A1 [...] On some occasions, I was requested by him to solve some tasks that occurred, but it was A1 that had the overall control over the project. This was not coincident since it might have delayed the project if everyone wanted to express their opinions.” (B1)*

Besides, it was mentioned that the expertise was utilized as a competitive advantage by shortening the project timeline and being more agile in doing changes along the way (A1, A4, E1).

*“Our competitor might have used twice as much time of building a similar facility. Probably in a four to five-year range. Typically, the competitor hires consultants across the Nordic states to develop a functional facility. However, this is much more time-consuming. We have much experience now, we have probably built seven to eight facilities for the last ten years. So, building these kinds of facilities is something we are capable of doing.” (A1)*

Considering the project's complexity, A1 needed to have a sense of control in the project, as he was the overall responsible. He expected that he should be involved in every significant project decision. Hence, he assembled his own personnel and coordinated the expertise, in accordance with past experiences (A4, B1, E1).

*“There are lots of people involved here. One should, for example, attend construction meetings with “project building,” in which the building owner brings a whole bunch of people. They bring along specialists on water, air, concrete, and steel. Accordingly, I have to ensure that we get what we requested. Hence, I must bring my specialists in these disciplines [...] Being a project manager, one has to maneuver through all the challenges one encounters. One has a lot of challenges when constructing a building like this one.” (A1)*

### **Solution Rationalization**

The project's purpose and the level of innovation were high, especially if we compared the project to similar projects. The interviewees emphasized innovative solutions and had conceptualized how and why innovation was necessary for this industry (B1, C1, D1, D2, D3, E2).

*“We see all these manual operators just standing, doing the same all day. Why not do it with a machine instead and make it automated? It is very difficult to attract people [...] So if the production workers don't want their kids to work in this industry, how do we get the workers then? Of course, as a businessman, I see it as a potential as well, but it also motivates me [to create innovative solutions].” (D1)*

Furthermore, the interviewees expressed the importance of trial and error. Experimentations enabled them to develop new ideas and new ways of thinking. Instead of relying on what they currently knew, they wanted to create new innovations further, to improve overall production and costs (A1, A3, B1, C1, D1, E2).

*“The market price for our main product has had the same nominally price for almost 20 years. The price level should preferably have been higher [...] Since the market price is so low, it creates a spark to innovate and find technological solutions to decrease the number of inputs in the production [...] Our company has invested heavily in profitability, in a way that reduces the costs.” (A3)*

Previous projects have shown that innovative initiatives have worked well, explaining the innovative efforts leveraged in this project. Also, the decades of testing different approaches have led the involved parties to agree upon a best practice approach.



*"When AI finds a recipe that works, then he uses it. There is no reason to throw it aside to try something new." (E1)*

### **Knowledge Diversity**

In addition to expertise, the interviewees reflected on the diversity of backgrounds and professions involved in the project. We found a variety of knowledge to be a prerequisite for project success because of the complexity associated with the project. Even though the responsibility for the participants seemed to be somehow flexible, there were still some boundaries that applied (A3, A4, B1, C1, D1, E2).

*"My main task during this project was to hire staff for this new facility. I had close contact with HR to provide me with people for the production site [...] I and AI had a great understanding of how the responsibility was shared between us [...] Hiring the staff was my responsibility and making sure the facility and installations were on point was his responsibility." (A3)*

The range of different backgrounds helped to solve tasks related to the project, meaning using former capabilities in new situations. Seemingly, flexibility is possible, despite the scope of tasks that each project partner had to accomplish (C1, D2, D3, E1).

*"I have an MBA as an academic background, but I am not solely using my economic background, but rather the project management part of my MBA to coordinate the project [...] In this project, I am contributing with my ability to structure, plan, and manage the project on behalf of my background and experience." (E1)*

Although academic background was a benefit for some of the project partners, specialized knowledge had a higher value. The importance of experience became particularly evident by analyzing the Organization's relationship with the building contractors. In contrast to the project partners, the building contractors used construction buildings experts. These experts had no experience within the

specific service industry but were rather specialized in various disciplines (A1, A3, A4, C1).

*“It is complicated when different professions come together. When we do encounter challenges, it is caused by external forces, like the construction developer in this project. They might have a different understanding, and they may only understand their own world [...] I see the challenges, but the people representing the different disciplines of the construction does not. They do not have experience from such an industry. They are excellent in what they do, but they have not approached similar projects before. Usually, the construction is completed before the customer can apply their final touches, however, we wanted to shorten the timeline of the project, by earlier involvement.” (A1)*

### **Different Perspectives**

A1 and A2, which constitutes two of three owners of the Organization, had two distinct perspectives that complemented each other (A1, A2). Their viewpoints allowed them to focus and solve problems within their area of specialty, which created a positive impact on the project (A1, A2, A3, A4, E2).

*“We are two brothers who succeeded our parents. A2 is economically educated, and I am a practitioner. We complement each other completely in this way. A2 is very financially focused, and I am very practical oriented. So, when we discuss projects, we have apparent work distributions.” (A1)*

The project also utilized the different perspectives held by the individuals in the project. The different backgrounds of the individuals were, therefore, used as a valuable resource in the project. It allowed the project to benefit from the underlying competencies and expertise (A1, A4, C1, E1, E2).

*“I came in with a slightly different perspective than one usually has. Often when you sit as an operation manager, it becomes an everyday situation*

*where you do not see things that should be handled, and that's what I see when I come in with my perspective. Then I can ask the critical question which the operation manager hasn't thought of. It's usually simple things, which can be solved by simple routines.” (E2)*

Moreover, we saw clear benefits derived from the internal autonomy of the project, where participants reported to be predominantly self-directed in the project (B1, C1, E2). Furthermore, autonomy enabled the individuals to find their strengths and specialize in the tasks they master (A1, A4, C1, E2).

*"There is room for error [...] I think we have a very good work culture. Now we are getting so big it is getting too big for me [to handle alone]. With market divisions and all that [...] However, my approach is that I stick to what I can." (A1)*

Further, we noticed a common innovative perspective among most of the interviewees (A1, A3 B1, D1, D2, D3, E1, E2). They shared a strong desire to improve their procedures and reduce the production inputs, simultaneously as they increased the production output. In this way, the common innovative perspective had a positive propellant effect on innovativeness in the project.

*" [...] the world is moving so fast that you are either a participant and a developer, or you might as well begin to close down [...] if one is not innovative and investing in the future, time will catch up.” (A3)*

### **5.3 Team Performance**

In this particular project, the project partnering and multidisciplinary team approach had a positive complementary effect on team performance. Especially because of the externalities derived from empowering the project participants, which enabled autonomy and flexibility within the project (A1, A4, B1, C1, D1, D2, D3, E1).

*“If I had to specify all the core related infrastructure that my partner does, I would have to prepare a tender request. I would have to do it, and it would have taken months. So, the way we do it allows us to run through the project much faster. I think one year, or one and a half years faster than normal. Because we collaborate with people we know. They have done it before, and they are good at it. Had I done it the other way, which a lot of people do, in which they specify every little detail, then I would have specific people who prepare all the papers, and it would have taken months. Also, it is very often that in such complicated projects that there are major deviations from the project plan. Things are going wrong, and there is always a lot of things they had not thought of [...] We would have lost more if we had sent it out on tender.” (A1)*

Further, we saw indications of a healthy working environment, with the focus on achieving goals and overcome project difficulties. Concerning the result and actual cost of the project, it seems to us that there was a wide consensus that the project was a great success (A1, A2, A4, B1, D1, D2, D3, E1, E2).

*“Can the machines handle the volume designated to them. There are many such things that make it easy to calculate whether it is a success or not [...] This facility was a success from day one. Despite many errors, but we projected them. We calculate that we would have a long punch list. Because many errors can be programming issues. There may be things that we know we need to change, and it might be our fault. It doesn't necessarily have to be mistakes, it might be a job that has to be done afterwards that one had no record of when ordering the facility [...] The budget here was 140 million NOK, and the actual cost became 140 million NOK.” (A1)*

Furthermore, the social dimensions of the project participants visualized the personal efforts in the project. A general trend was that the participants felt emotionally satisfied with their colleagues and their efforts but also that a sense of

ownership toward the end result was established (A1, A3, B1, C1, D1, D2, D3, E1, E2).

*“It is a close relationship. It is based on trust and responsibility, and assurance that you know that your project partners are experts in their field and meet deadlines. Also, we have not been so many. The communication has worked fine since there have not been many people involved. A healthy culture with satisfactory information flow.” (C1)*

The interviewees expressed their motivation and appreciation of working together with experienced and trustworthy partners. They described previous projects as an essential factor for high team performance (A1, B1, C1, D1, D3, E1, E2).

*“The motivation behind the project structuring is that it works. We have documented that this approach works [...] That is why we are doing it this way because it works [...] We see it in the numbers, and we see it in people. The leadership group says it's much more enjoyable to come to work, and it's great to be able to contribute.” (E1)*

However, we also noticed that the contractual flexibility and adhocracy approach were a tradeoff where the project partners endured higher risk, intending to achieve better results (A1, A2, B1, C1, D1, E1).

*“If one is to have a high rate of innovation, then one must delegate. The risk of such a high rate of innovation and little formal project management is that it can become a disaster, and then it is unclear who will take responsibility for it. The benefit is that we can run a lot of projects simultaneously and achieve a lot of innovation and development. The downside is that individual projects and innovations could obviously have been better if we had worked in a more formal team, and with more people, but it doesn't quite work in our organization to work like that.” (A2)*

## Part VI Discussion

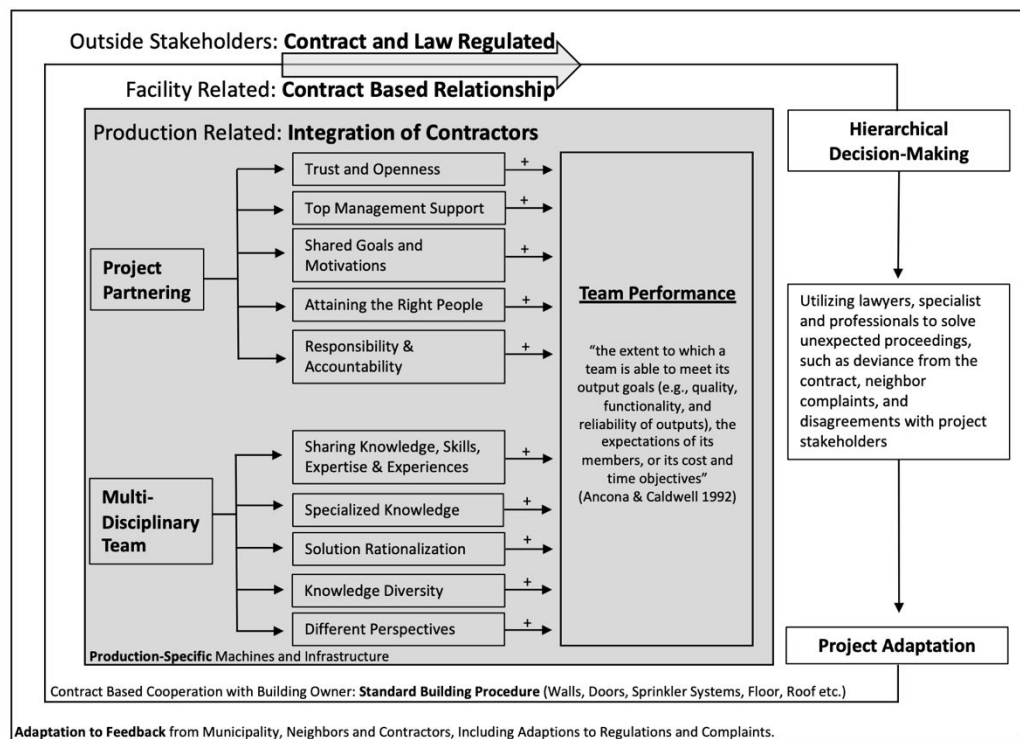
Early in our analysis process, we discovered different project approaches within the project. There was especially a huge distinction between how the building contractors and the project partners conducted their assignments. Hence, we found mainly two different contractual approaches: the project partner approach and the formal contractor approach, as illustrated below in Figure 2. These two distinct approaches are of interest because it allows us to compare the effects of the two different approaches on the same project.

Consequently, we found the facility-specific and area-specific part of the project (the two outside layers of Figure 2) to take place in a highly formal-, law-, and contractual-regulated setting. Consisting primarily of the building contractors and their subcontractors, but also stakeholders that were not directly involved in the project. However, these stakeholders had a considerable effect on the overall project outcome. These include neighbors, infrastructure contractors, the local state, and the municipality in which the building took place. These two layers utilized standardized and law regulated procedures, which subjected the project to a considerable degree of inertia. If there were a requirement for change or adjustments, then the standard procedure would be to use lawyers or consultants to solve any issues. Furthermore, because stakeholders in these two layers used lawyers to set up their agreements (complaints), the Organization used lawyers to read through and adjust the project accordingly (A1).

In contrast, the production-related part of the project (the inner layer of Figure 2), integrated the contractors and thereby achieved contractual flexibility. This was possible since the involved participants had worked together in previous projects and had gradually developed an open and transparent relationship. In other words, trust allowed the partners to operate with contractual flexibility, empowering the project participants to conduct the necessary changes. The flexible approach also managed to attain and connect resourceful individuals easily when their expertise, skills, or experiences were needed.

Figure 2 displays the project approaches in the project, where we focused primarily on the grey area, where project partnering and multidisciplinary teams are occurring in a symbiosis. In Figure 2, we see the relationships as layers between the stakeholders in the project. The Organization understood the importance of project partnering, and consequently developed an honest relationship with its project partners, in the production-related part of the project. By engaging in project partnering, the Organization created a win-win situation, where instead of fighting for the biggest share of the “cake,” project partners helped “to bake a bigger cake” (Eriksson, 2010; Hosseini et al., 2016). It was especially evident when comparing the different layers of relationships in Figure 2, where we identified a drastic difference between the inner production layer (project partners), compared to the outer facility- and outside stakeholder layer (contractors and external stakeholders).

Figure. 2. Project layers



## 6.1 Project Partnering

### Trust and Openness

We saw incidents where trust and openness were actively applied in the project. Our findings suggest that trust and openness helped team effectiveness through contract flexibility and flat hierarchy. Besides, research suggests that trust and openness occur in productive teamwork environments (Tabassi et al., 2017). Notably, this project was planned and executed in a rather short period. It would not have been possible with a rigid and bureaucratic structure since such a structure is exposed to a considerable degree of inertia. Yet, research has not successfully managed to transfer strong theoretical concepts of trust and openness into practical settings (Du et al., 2016; Ghazinejad, Hussein, & Zidane, 2018).

However, flexibility was, occasionally, responsible for misinterpretations within the Organization. Meaning that delegated tasks and responsibilities were too informal, causing different understandings of the assigned tasks. As a result, some assignments in the project were delayed or not sufficiently executed by the project participants. Project tasks did not meet the expectations because some of the Organization's employees were not fully committed to the project. Here two reasons might explain the lack of motivation. Firstly, the project task was in addition to their regular work. Secondly, the workload might have been too much for the participants to meet the project manager's expectations. Also, informal project tasks sometimes lead to misunderstandings of the formal responsibility of the assigned tasks. Research highlight similar findings as large and complex projects tend to be more difficult for project partners to execute and achieve common goals (Eriksson, 2010; Hosseini et al., 2016). Hence, we suggest that larger tasks should be more formalized, as risks increase. Overall, the project benefitted from informal and flexible operations, where these minor issues were eventually solved. However, larger projects of this type might not benefit the same way of flexible- and informal procedures, as these projects become too big and require more formalities.



### Attaining the Right People

In the project, trust and openness were applied as levers to enable project advantages. As theory implies, project teams, in general, must have some level of cooperative and trustworthy relationships, to engage project partners into the project (Engebø et al., 2019). First, the project team developed a stable platform for a healthy and accurate stream of communication. The valuable communication leads to faster decision making, which in return provided faster implementation and less error attached to bureaucracy. Also, efficiency and flexibility were feasible by reducing the number of individuals involved. The focus here was to include team members with high confidence and commitment to the project. Additionally, the project partners obtained a high level of commitment, sharing the same expectations as the Organization, namely, to deliver cutting edge results. The high level of trust and openness diminished potential barriers to innovative creations, which was endorsed in the project.

Moreover, we assume that trust and openness developed over the years have been used to create an innovative and skilled environment for idea development and optimization of project results. Early involvement of partners and promoting innovative ideas, contributed to team performance, as project partners were incentivized to achieve ambiguous goals. Eriksson (2010) emphasized similar concepts that project partners should be involved to a greater extent than ordinary contractors. Greater involvement is necessary to achieve a cooperative relationship, where client and project partners can achieve common goals in a variable sum game (Larson, 1995).

Furthermore, the theory implies that complex and technical projects generally require substantial transparency for handling complexity and difficulties within the project. Transparency and open communication make decision-makers able to deal with limitations and risks in the project (Droste-Franke et al., 2020; Owusu et al., 2020). In this project, A1 mentioned that some of the first projects were simpler and less complex. However, recent projects are simply too big to deal with alone and required more involvement and delegation of responsibility to

project members. That is why close relationships with project partners have been increasingly important, as the projects have become more complex.

### Responsibility and Accountability

A fundamental indicator of the informal relationships in the project was contract flexibility, based on trust and openness, shared by the project partners. The Organization expressed that their written formalities were less specific concerning their project partners than their contractors. Moreover, the Organization emphasized the use of soft elements to influence and achieve team performance in the project. This was an exciting finding, as researchers suggest that one has to implement hard elements to enforce soft elements, such as demanding openness through contracts (Wøien et al., 2016). This was not the case in the production-specific part of the project. Instead, the Organization used collaborative tools such as early involvement, where they engaged different professions in brainstorming sessions. As a result, they created one overarching common goal, namely, to optimize the facility output and minimize the production input. Moreover, academics suggest that flexibility and adaptability should be preferred above formalized contracts, as projects become more complex (Wu et al., 2018; Wøien et al., 2016).

### Shared Goals and Motivations

In the project, the project partners, compared to the general contractors, shared a broader understanding of the Organization's needs and expectations. We saw relatively clear incidents where project partners shared common goals and motivation with the Organization. This phenomenon is extensively researched, and indicates that project partners go beyond formal expectations, and strive to improve (Bellini et al., 2016; Cheung, Suen, & Cheung, 2003). Besides, researchers point out that the concept of shared goals and motivation works if the project participants focus less on their agendas when developing common goals (Engerbø et al., 2019). Furthermore, one interesting finding was that some of the project partners expressed that they wanted to improve their project performance, but also to improve the overall industry. Specifically, they showed a passion for improving the industry by finding new ways to produce and replace hard physical

labor with autonomous machinery and solutions. The determination to find new and improved solutions, strongly influenced team performance, by improving their attendance and affecting others.

Additionally, the Organization created an environment and culture that attracted and motivated their colleagues to stay and develop their competences. As a result, a complementary effect between the project partners and the Organization was established, as it got more intriguing to work on projects with the Organization. Hence, the Organization operates with the same project partners in most building projects. In these projects, accommodating innovation and smart solutions were prioritized, which motivated the project partners to advance. The motivation to improve enabled the project partners to invest time and effort into this customer relationship. As a result, the Organization can choose from a larger pool of competence and innovation, as their projects are challenging and rewarding.

#### Top Management Support

An important consideration from the findings was the involvement of the top management. The top management was heavily involved in the project. A1 was seemingly both the project owner and the project manager of the project. Also, A1 and A2 were two of the major shareholders of the Organization. A2 was also the chairman of the board of directors. These factors elevate the meaning of trust and relationship with the project partners to a new level. A1 had a vital role and voice in the decision-making process and he was primarily responsible for the team's performance in the project. The top management used a flexible involvement approach, which meant that it was relatively easy for project partners to get in touch with the decision-makers. As a result, it was easy to conduct changes, generally in the project. Hence the change barriers were reasonably low, and the project partners could easily engage with the top management in the Organization.

Moreover, the project partners described great mutual respect towards the Organization as trustworthy and respectful, but also the obligation project partners felt to perform in the project. The owners' involvement in the project seemed to affect team performance in various ways. A1 had a high level of credibility and

integrity. He was heavily involved in the project overall, giving him great responsibility and intelligence of the project performance. Further, years of experience and expertise, supported by integrity, helped create and distribute common goals and objectives with loyal project partners. We evaluate top management support as vital for team performance, as it elevated the dimensions of mutual respect and transparency toward the project partners. Recognizing the technological complexity and technical challenges associated with projects, researchers suggest that radical transparency should be a requisite for handling projects' complexity and inaccuracies. This because transparency can enable open communication between decision-makers so that the project participants can handle inherent limits and uncertainties within the project (Droste-Franke, Voge, & Kanngießer, 2020; Owusu et al., 2020).

## **6.2 Multidisciplinary Team**

The flexible inclusion of different disciplinary backgrounds in the project was a feature that enabled the Organization to deal with complex problems that occurred in the different project phases (Onubia et al., 2019). Consequently, the multidisciplinary team was a valuable feature in the project because of the complex and confounded nature of the project. According to the development director of the Organization, a general project approach in this industry would take a considerably longer time to conduct a similar project, since other organizations rely on hierarchical and bureaucratic problem-solving. Typically, this approach involves hiring specialists across the Nordic countries to develop a functional facility, and accordingly start recruiting different local experts to the project. Hence, the bureaucratic approach is much more time consuming and resource-intensive (A1). In contrast, whereas some of the competitors preferably hired consultants and specialists for their projects, the Organization initiated a more relationship-based approach. Even though the Organization in the short term pays a higher price for their projects, they will in the long term, benefit from innovations and the positive implications project partnering offers.

### Sharing of Knowledge, Skills, Expertise & Experiences

One of the most significant contributions to the high team performance in the project was the willingness to experiment with new ideas and prototypes. Most of the project participants emphasized the importance of experimentation to discover new ideas and new ways of thinking. As a result, they facilitate collective learning where the team members can share and learn by viewing things from different perspectives (Pennington, 2008). Besides, the particular project approach which was applied here was based on decades of experimentation with different project approaches—developed and improved by a set of essential participants within the Organization and by the relationships with the project partners, which gradually evolved.

However, decades ago the Organization did not employ different disciplines to conduct projects, but rather just started building the facility (A1). Naturally, this approach leads to a high degree of trial and error, which these individuals have learned from and adapted into their project execution-style, which improved the team performance in the upcoming projects. However, recent projects are more technologically intensive and of a much larger scale, making the project highly complex. The Organization is, therefore, required to involve a much broader spectrum of specialists, experts, and experiences, which they have decided to do by close cooperation with its project partners and hiring many individuals with different disciplinary backgrounds, within the Organization.

In the project, we saw that the long history of experimentation in the company has resulted in a best-practice approach, customized and optimized to the current status quo. The best practice approach utilized the multidisciplinary setting to spark collective thinking and used the individual strengths to improve the overall team performance.

### Solution Rationalization

The inclusion of different disciplines enabled solution rationalization between the different project participants and subjected the decision-making process to various perspectives. One could also notice that the project meetings functioned as a

collaborative platform where the different disciplines shared their insights, expertise, and knowledge. In this way, the project meetings enabled sharing between the disciplines in a low-threshold way, allowing the project participants to learn from previous projects and experiences. Besides, it helped them to subject their ideas to other professional insights (Garcia-Milian et al., 2013). The collaborative platform enabled the project to increase team performance in the production-related part of the project (inner layer of Figure 2), by integrating the contractors.

In the outer-layer, the Organization experienced resistance and lack of transparency with the contractors in the project. The barriers occurred because the Organization and its project partners had not yet sufficiently developed a trustworthy and open relationship with the building contractors. This was due to a lack of previous work relationship with the contractors; as a result, detailed formal contracts were made between the Organization and the contractors (outer layer of Figure 2).

#### Specialized knowledge & Knowledge Diversity

Regarding the academic background, the project participant emphasized that they used only parts of their formal education, while experience from previous projects was greatly utilized in this project. Hence, learning by doing triumphs formal academic backgrounds in this industry-specific project. The importance of experience in the industry became especially evident in the relationship between the building contractors and the Organization. The building contractors had allegedly no experience within the specific service industry, but they had construction building experts specialized in building standardized storage facilities. Hence, the Organization had to carefully examine the building's specifications so that the building could realize the intended business purpose. However, the Organization managed to include the contractors' representatives in their collaborative platform. The inclusion leads to a flow of valuable information, as well as incentivized knowledge exchange between the project participants (Hausberg et al., 2019; Parkman, 2019; Sethi et al., 2001). Consequently, the

project was completed within the expected time estimate and cost budget, which is another indication of good team performance (Kostopoulos et al., 2013).

The interviewees revealed that the project participants held a growth mindset, where they strived to improve personal performance and enhance others. The team-building effect was mentioned as a competitive differentiator. An advantage that enabled the Organization to utilize the expertise held by the project participants. Resulting in a competitive advantage which shortened the project timeline, but also incentivized changes in an agile, low-cost manner. Another benefit was that a significant amount of the project participants had grown complementary perspectives, through decades of close cooperation. The supplementary effect facilitated unique insights into the decision-making process without engaging a hierarchy of experts in the project.

Besides, the Organization involved a few highly skilled colleagues, which complemented each other, creating a flatter hierarchy. The flatter hierarchy contributed to team performance by speeding up the decision-making processes and reduction of inaction. Furthermore, by involving preferably few individuals, the information was quite concentrated, which also contributed to increased team performance, as the participants knew whom to contact to obtain relevant information.

Further, a small project team is somewhat uncommon, as it is generally expected that the team size should vary in relation to task complexity, scope, and the scale of the project (Laurent et al., 2019). Based on our findings, we cannot conclude that formal educations had a significant effect on team performance. However, formal education was necessary for some project positions, such as machine developers, which usually required technical background. Nevertheless, in the project, the team members' ability to learn and share knowledge across disciplines had a higher effect on team performance. Thus, both the project partners and the Organization valued the capability to share and learn collectively more than the formal academical background.

### Different Perspectives

The project participants possessed an understanding of how their expertise contributed to the project. All conceptualized how and why innovation was necessary for the industry. Most of the interviewees also mentioned that they were mostly self-managed and encouraged to find their strengths and specialize in the tasks they mastered. The self-managed feature allowed the production-specific part of the project (inner layer of Figure 2) to occur smoothly, positively affecting team performance.

The interviewees also expressed that the Organization's hierarchy was quite flat in practice, which meant that it was easy for them to gather information or conduct changes. Especially the attribute that changes were easy to make, greatly improved team performance. Because both the Organization and the project partners could discuss and test their ideas, without surpassing the budget. Hence, the multidisciplinary project approach encouraged discussion and facilitated theory creation by utilizing its participants' knowledge base without restraining the idea generation to a distinct paradigm. Consequently, enabling the participants to elaborate and extend on each other's knowledge (Harder et al., 2013).



## **Part VII Implications, Limitations, and Future Research**

The study found ten factors that influence team performance. Besides, qualitative reasoning from real-life settings was applied, which provides managers and other practitioners practical insights into a particular project which utilized project partnering and multidisciplinary team. Also, the study presents data from a project where the top management and owners conducted a hands-on project approach, with heavy involvement. Altogether, the data visualize the interdependency between the ten factors, highlighting that the characteristics are dependent on one another for the project approach to function optimally. Consequently, the project approach is a result of years of processes, making the exact project approach relatively hard to imitate and replicate.

### **7.1 Implications**

#### **Theoretical implications**

We presented and highlighted the main characteristics of project partnering that affected team performance; Trust and openness, top management support, shared goals and motivations, attaining the right people, responsibility, and accountability. These five project partner characteristics positively influenced team performance in the project. Further, the study also found five multidisciplinary features that impacted team performance positively. Namely, sharing knowledge (skills, expertise, experiences), specialized knowledge, solution rationalization, knowledge diversity, and different perspectives. Together these attributes ensured more efficient project execution. Notably, because the ten features complemented each other, thereby strengthening the effect on team performance.

Moreover, the interviewees expressed that their project approach was dependent on mutual trust and transparency. Making the project approach vulnerable and dependent upon the relationship between the involved project partners. However, the project partners managed to create a mix of formalized tasks combined with contract flexibility due to the trust they had toward their partners. Team performance magnified as a result, which is congruent with the theory that suggests that trust and transparency are beneficial in complex projects (Wøien et

al., 2016). Research emphasizes that trust and openness contribute to improved project performance (Du et al., 2016; Ghazinejad, Hussein, & Zidane, 2018; Suprpto, Bakker, Mooi, & Hertogh, 2016; Zidane, Hussein, Gudmundsson, & Ekambaram, 2016). Overall in the project, trust and openness played a vital role, fortified by years of working relations. A feature that other project partners and organizations usually struggle to attain (Pemsel, Müller, & Söderlund, 2016).

### Practical implications

The complementary effect of combining project partners and multidisciplinary teams could be intensified by developing a collaborative platform. Combining the two concepts improved team performance in this project. Many of the project participants had various academic backgrounds, but they claimed their practical experiences and cooperative social behaviors to be more critical. Combined with trust and openness, there were frequent exchanges of mutual respect between project partners and the Organization. We believe that team members' academic backgrounds had a subconscious effect on team performance by affecting the credibility and integrity of the members involved.

Further, top management support is considered as a necessary capability for project managers to establish collaborative environments. Theory highlight that the top management is supposed to be an advisor, actively supporting the project. Generally, project managers tend to experience a lack of activity or involvement of top managers (Engebø et al., 2019).

In this project, the top management maintained a vital role for the team performance, going beyond advising and being mainly responsible for the project. Our findings illustrated the importance of the top management possessed in the project. This study extends the research on the influence top management has on project management and, ultimately, team performance. The project's approach displayed a positive effect derived from involving owners and top management in the project. The top management involvement enabled the project to maintain flexibility and terminate minor problems before these problems significantly affected the project. The presence of the owners at the project site also contributed

to higher team motivation and higher team performance. Especially because the owners provided a deeper meaning behind their everyday work, but also because additional information was quickly accessible.

## **7.2 Limitations and Future Research**

A general limitation to this single case study design is that the internal- and external- validity is at risk. Meaning, we are unlikely to uncover stable theoretical mechanisms and unlikely to generalize our findings because we have chosen to focus on one particular project. However, our study's ecological validity is high since it takes place in a real-life context, which implies that our findings can be generalized to real-life settings (Bell et al., 2019). Further, this study runs the risk of low reliability, as the project and the components related to the project are somewhat complicated. Replicating similar project contexts will be time-consuming and somewhat difficult to imitate due to complex partnerships and relationships developed over decades.

Another limitation was that we only interviewed 15 project participants, and no one represented the building contractors. All the data we gathered about the facility-related contractors comes from interviews with the Organization and their project partners. The risk of biased data, not favoring the facility-related contractors, might be present. However, our objective was to highlight how project partners with multidisciplinary teams affected team performance. We considered it not significant for this study to investigate the facility-related contractors and their relationships, due to the study's scope. Further, we acknowledged that the contractors had their own project partners in this project but chose not to investigate these relations, as it would unnecessarily weaken the results, due to the broader scope.

### **Future research**

Future studies should investigate how contractual rigidity and contractual flexibility influence team performance and project results. Mainly, how more formality influences team performance, compared to the informal approach used in this project. An interesting hypothesis could be to test whether improved

formalities in similar complex projects, create lower project risks and a higher degree of responsibility and accountability, as some of the interviewees assumed. Furthermore, longitudinal studies could investigate how team viability differs in a project with project partners relationship versus a company that only utilizes formal contracts. Also, further research on project partnering might develop a better understanding of why project partners tend to lack trust and transparency in practical settings, even though research highly encourages the use of trust and transparency to improve team performance (Bellini, Aarseth, & Hosseini, 2016).

In this project, the top management played a crucial role, and research has generally mentioned top management support as a benefit to projects (Engebø et al., 2019). However, we would encourage future research to investigate the potential of top management support. Also, whether the project approach is dependent upon highly involved top management, constituting major shareholders. The team performance effect derived from engaging top management with company ownership, directly in the project, is not sufficiently researched, and could potentially be an essential component in projects. Future studies should, therefore, investigate similar projects, with and without top management and shareholder involvement. The effects of top management and shareholder involvement are uncertain and yet to be extensively researched (Engebø et al., 2019).

### **7.3 Declaration of Conflicting Interests**

The researchers gained access to interviewees partly through previous working relations and other personal obtained connections with the Organization. However, the researchers have not received funding in the conduction of this study, and declare no conflict of interest.

## Conclusion

The study indicates that project partnering combined with multidisciplinary teams, enhance team performance, and improve project results. Through project partnering, they develop shared goals and incentivizes project participants to create a healthy collaborative environment with a high degree of autonomy and motivation toward the project. Regarding multidisciplinary teams, the broad scope of different backgrounds contributed to creative and innovative developments. We suggest that project owners can benefit from including both project partnering and multidisciplinary teams in complex projects. Project partners and multidisciplinary teams seem to have a reinforcing effect on team performance in complex projects.

Further, the study highlights the potential contributions top management support brings to complex projects. The top management in this project was heavily involved, including major shareholders of the Organization and project partners. It was essential for the Organization to succeed, which incentivized the top management to get personally involved. Previous research suggests that top management can positively influence projects. However, we propose that top management has an increasingly important role in complex projects than previous research has suggested. We encourage future research to explore whether top management should be more involved in complex projects and whether major shareholders should be included or represented in essential projects.

Our basis for this study was to explore components that enhanced team performance, focusing on project partnering and multidisciplinary team. Previous studies have focused on trust and openness in project partnering, and well-educated participants in multidisciplinary teams, as the main drivers for achieving team performance. We have noticed these characteristics, and we believe there are other vital components in addition to these contributions. Our findings highlight the importance of other components, such as top management support and practical experiences in the industry, as enhancers of team performance.

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