

The effects of social processes on project performance in international projects

A quantitative study on how social processes affect project performance in international projects

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Abstract

Organizations face increasingly dynamic, uncertain and complex business environments. Projects have emerged as a reaction to these environmental challenges. This thesis aims to obtain a better understanding on how social processes affect project performance in international projects. We expand the existing research on international projects by considering project complexity and national-culture diversity as having moderating effects on project performance. Media is posited to have a mediating effect on the relationship between social processes and project performance.

In this thesis, a hierarchical component model was applied with reflective lower-order constructs and formative higher-order constructs using partial least square structural equation modelling, with a sample of 102 respondents. Our findings considered knowledge sharing, transfer knowledge effectiveness, familiarity and trust as social processes, which positively affected project performance in international projects. Furthermore, no significant moderating or mediating effects were found based on our empirical evidence.

Preface

This Master's thesis marks the end of our master's degree in Business Administration at the School of Business and Law, at the University of Agder. We would like to give a special thank you to our supervisor Andreas Erich Wald, Professor of Management at the School of Business and Law at the University of Agder, for giving us the proposition of this interesting topic, as well as providing excellent and constructive guidance whenever needed.

We also want to thank Erik Yves H. Adalberon and the University library and IT service, for good guidance on the implementation of SurveyXact, as well as Torbjørn Bjorvatn for valuable advice concerning the data collection process. Lastly, we would like to give a special thank you to Prosjekt Norge, who published our survey on their official web site, giving us the opportunity to reach out to all of their respectable members.



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Introduction

Projects are seen as temporary organizations, where an assembled team addresses a particular and complex challenge within a predefined timeframe, thus separating it from ordinary entities (NFP, 2018). In order to define a project as international, it must spread across at least two countries and involve a team from at least two different cultures (Mesly, 2015). International projects are increasingly prevalent in the evolving and globalized market (Bjorvatn & Wald, 2019). Continuous research is necessary in order to understand the processes behind international project success.

Previous research has established several concepts positively affecting project performance. First, knowledge sharing has proved to positively affect project performance, both in a domestic and international context (Adenfelt, 2009; Adenfelt & Lagerström, 2006a, 2006b; Gasik, 2011). The process of knowledge sharing entails communication and interactions between relevant actors (Adenfelt & Lagerström, 2006b). In addition, effective knowledge transfer is an important process of project success and has received limited research. Transfer knowledge effectiveness measures the usage of the knowledge shared (Ali, Musawir, & Ali, 2018; Bjorvatn, 2019). Trust and familiarity are processes contributing to improve both knowledge sharing and transfer knowledge effectiveness (Ali et al., 2018). Trust reduces uncertainty, while familiarity increases social interactions between project members (Adenfelt & Lagerström, 2006a, 2006b; Akgün, Byrne, Keskin, Lynn, & Imamoglu, 2005).

In our study, social processes are defined through; knowledge sharing (Adenfelt, 2009; Adenfelt & Lagerström, 2006a, 2006b; Gasik, 2011), transfer knowledge effectiveness (Ali et al., 2018; Bjorvatn, 2019), familiarity and trust (Adenfelt & Lagerström, 2006a, 2006b; Akgün et al., 2005). Social processes facilitate the creation of social capital and knowledge within a project (Ali et al., 2018; Yli-Renko et al., 2001). Social interaction and knowledge exchange are common denominators for the mentioned processes. The four processes have proven to have a positive relationship on project performance in their respectable articles. Our study considers these processes in an international context as advocated by Adenfelt (2009). The following research question is established: How does social processes affect project performance in international projects?

International projects have proven to be complex (Arrow, McGrath, & Berdahl, 2000; Bjorvatn & Wald, 2018; Ilgen, Hollenbeck, Johnson, & Jundt, 2005). Being geographically dispersed, international teams face language barriers and cultural diversity, resulting in a lack of interpersonal relationship (Adenfelt, 2009; Adenfelt & Lagerström, 2006b; Bjorvatn & Wald, 2019). These challenges restrict the knowledge development process, which has proven to be essential in order to achieve project success (Gasik, 2011).

Project complexity has proven to negatively affect project performance, in the sense of the total efficiency of the project (Arrow et al., 2000; Bjorvatn & Wald, 2018; Ilgen et al., 2005). Hence, complexity is assumed to have a moderating effect on international project performance and is included in the conceptual model as a moderator.

Furthermore, national-cultural diversity refers to how diverse a team is, considering the number of cultural backgrounds (Lisak, Erez, Sui, & Lee, 2016). These differences might lead to weak knowledge sharing (Adenfelt, 2009; Adenfelt & Lagerström, 2006a, 2006b; Gasik, 2011). Hence, national-culture diversity is expected to have a moderating effect on international project performance (Bjorvatn, 2019), and is included as a moderator in our conceptual model.

Moving on to a new concept, media has proven to be of great importance in order to attain well-functioning social processes and achieve successful project performance (Bjorvatn & Wald, 2019). Along with rapid globalization, an increase of communication tools makes it easier for organizations to communicate across country borders (Jarvenpaa, Shaw, & Staples, 2004; Malhotra & Majchrzak, 2005). Hence, media is expected to have a positive mediating effect between social processes and project performance and is included in the conceptual model.

Our contribution to the research on the connection between social processes and project performance aims to confirm that the accumulated social processes positively affect project performance in an international context, as endorsed by Adenfelt (2009). In addition, we aim to underline how project complexity as well as national-culture diversity mark important points of consideration for the exploration of new patterns and the creation of new theories on project performance. Media richness is also included as an exploratory conjuncture. Hence, our study contributes to theory on international projects in three distinct ways. Firstly, it aims to confirm already existing empirical evidence regarding social processes' effect on project performance

in an international context. Secondly, it aims to explore the moderating effects of complexity and national-culture diversity on project performance. Finally, the mediating effect of media is explored and determined.

This thesis presents six main parts. In chapter 1 we give a literature review of the main contributions to the topic on which this thesis is based. Chapter 2 includes the theoretical foundation of our thesis, definitions of relevant terminology, as well as formulating hypotheses. These theories are means of interpreting the data and results to the underlying drivers of project performance. In chapter 3 we go through and explain the methodology used, as well as possible sources of measurement error. Chapter 4 presents the analysis and results from our findings, whereas both the measurement model and structural model are included. Chapter 5 provides a discussion of our findings and their theoretical contribution, practical implications and limitations and future research. Finally, chapter 6 summarizes and concludes our findings.

1. Literature review

This thesis argues that social processes affect project performance in international projects. Knowledge management is broadly covered in a wide span of literature. Contrastingly, less research has been done on the impact of social processes on project management. Our research specifies within this field by focusing on knowledge management and social processes' effect on international project performance.

The research of Gupta and Govindarajan (2000) stands as an early contribution to the understanding of knowledge management within multinational corporations. The scholars argue a firm's knowledge base accrues one of the greatest factors to sustainable differentiation, which results in competitive advantage. Multinational corporations consist of complex networks with significant passage of authority and responsibility to the subsidiaries. Gupta and Govindarajan found that knowledge sharing through management proved of great importance for a well-functioning knowledge management.

In later research, the idea of knowledge networking and interpersonal awareness is further investigated. Here, the concept of task complexity is also examined, in a domestic context (Akgün et al., 2005). Akgün et al. (2005) underlined the importance of trust, familiarity, professionalism and dedication, as well as open and constructive communication in working relationships. Task complexity is included as a moderator for project performance, due to the central feature of determining its performance and consequent information needs. Concludingly, they found that team member familiarity and interpersonal trust had positive impacts on the transactive memory system and product success. Furthermore, Adenfelt and Lagerström (2006b) found that a lack of interpersonal relationships, combined with disconnected practices, restricted the knowledge development process in transnational teams. In an additional case study, the scholars discovered that organizational culture as the highest initiators of knowledge creation and sharing in an international team. Organizational culture includes both trust and cooperation within an international team (Adenfelt & Lagerström, 2006a).

Both case studies conducted by Adenfelt and Lagerström (2006a, 2006b) highlighted the importance of knowledge sharing in an international context. They found that a solid knowledge management system, especially through communication and coordination, is a

necessary factor to achieve the highest possible degree of knowledge sharing. In addition, the understanding of knowledge creation and knowledge sharing practices is essential in order to achieve successful results in transnational teams. Adenfelt (2009) supplement the research on how knowledge sharing affects project performance. The scholar addresses the cruciality of knowledge, which has become one of the central competitive concerns for many multinational corporations. Knowledge sharing is enabled through coordination and communication and is one of the core factors in developing successful international products. The study found that successful knowledge sharing is contingent upon the level of shared knowledge between project members. Due to being geographically dispersed, as well as functionally and culturally diverse, establishing shared knowledge is a cumbersome issue in a transnational project. Gasik (2011) also argues that the most important resource needed for project management is knowledge. He also presents poor project knowledge management as one of the core reasons for project failure.

More recent research tries to fill the gap concerning transfer knowledge effectiveness in international teams. Due to recurring difficulties in sharing knowledge for an international team, a well-functioning management is essential in order to coordinate and transfer knowledge effectively. Ali et al. (2018) argues that effective knowledge management provides incentives facilitating knowledge sharing. Effective knowledge management is attained by removing barriers, such as excessive departmentalization, while at the same time developing cooperative organizational structures. Bjorvatn (2019) provide additional empirical evidence on transfer knowledge effectiveness in international teams. The scholar finds that both geographical distance and cultural diversity have a negative effect on absorptive capacity as well as transfer knowledge effectiveness. These findings suggest that international projects are more complex than domestic when looking at transfer knowledge effectiveness.

Social processes have been examined within the field of knowledge management from various viewpoints and contexts. Mu, Peng and Love (2008) argues that a firms social capital can be leveraged to gain competitive advantage. The scholars also refer primarily to knowledge, resources and capabilities accessed in a social network, and capital mobilized through ties within the network. Increased shared tacit knowledge boost the mutual understanding and cooperation. This lowers the transaction cost of knowledge exchange, improving the effectiveness and efficiency of knowledge sharing. Ali et al. (2018) includes the concept of social processes and its effect on project performance. Their research accumulated trust,

familiarity, proximity and communication as social processes and drivers of project performance in a domestic context. Their findings establish a significant positive relationship between social processes and project performance.

Based on the presented literature, there are several common phenomena explaining the drivers of project performance. In sum, knowledge sharing (Adenfelt, 2009; Adenfelt & Lagerström, 2006b; Gasik, 2011), transfer knowledge effectiveness (Ali et al., 2018; Bjorvatn, 2019), familiarity and trust (Adenfelt & Lagerström, 2006a, 2006b; Akgün et al., 2005) is repeated as important processes in achieving project success and can all be accumulated into once concept, social process (Ali et al., 2018).

As mentioned, project complexity is particularly relevant for international projects (Bjorvatn & Wald, 2018). Bjorvatn and Wald expand the project management research by including team-level absorptive capacity and its mediating role between project management success and project complexity. The scholars find a positive correlation between the projects complexity, delays and overspending, which decreases the success of the project. When looking at teams absorptive capacity, the empirical evidence establishes a positive correlation to project performance.

Bjorvatn and Wald (2019) broadens the scope on international projects when they focus on the use of media in international teams. They compare domestic and international teams choice of media and extends the media richness theory by looking at the importance of contemporary business communication. Their research provides empirical evidence of the impact complexity and national-culture diversity have for media choice. Their findings show a positive correlation between complexity and national-culture diversity in international teams, which resulted in a higher degree of media-richness.

To summarize, there are several common denominators based on the presented research, which constitutes the foundation of our research. The research mapped out above provide good insight to how knowledge management through knowledge sharing (Adenfelt, 2009; Adenfelt & Lagerström, 2006a, 2006b; Gasik, 2011) and transfer knowledge effectiveness (Ali et al., 2018; Bjorvatn, 2019) affect project performance, as well as the importance of familiarity and trust (Adenfelt & Lagerström, 2006a, 2006b; Akgün et al., 2005) within the project team. These four concepts are considered as social processes, and the literature constitutes a positive correlation to project performance. Furthermore, based on the international perspective, there is reason to

believe complexity and national-culture diversity have moderating effects on project performance (Bjorvatn, 2019; Bjorvatn & Wald, 2018). In addition, inspired by Bjorvatn and Wald (2019) media is considered to have a mediating effect on project performance. This thesis provides a contribution to these concepts.

2. Theory and hypotheses

Historically, organizations have been conceptualized as a system that solves or processes problems (Nonaka, 1994). This definition is grounded in how efficiently an organization can employ knowledge management in order to process information and make decisions in uncertain environments. This paradigm suggests an input-process-output sequence of hierarchical information processing. However, this approach often results in a passive and static view of a given organization. Information processing, or knowledge sharing, is viewed as a problem-solving activity, simply given to the organization, without considering what created the organizational knowledge. Organizations that dynamically deal with changing environments tend to create knowledge through efforts to process information efficiently (Nonaka, 1994).

The theory of organizational knowledge creation points to how important collaboration among project team members are to promote knowledge creation (Adenfelt & Lagerström, 2006a). In this manner they form a network across business-systems, leading to a dynamic knowledge cycle which continuously creates, exploits and accumulates organizational knowledge. The theory holds that knowledge is created through continued dialogue between explicit and tacit knowledge (Adenfelt & Lagerström, 2006a; Nonaka, 1994). The knowledge creation theory anchors a potential reasoning as to why the mentioned social processes should have a positive effect on project performance, since knowledge is one of the most important drivers of project success (Gasik, 2011).

2.1 International project as an implement to successful project performance

Davenport & Prusak (1998) defines knowledge as a blend of gained information, values, qualities and experiences that together provides a framework for understanding and integrating new information and experience. Knowledge does not only exist in written documents in organizations, but also in the routines, norms, practices and processes that makes the organization special. As mentioned, knowledge can be divided into tacit and explicit

knowledge. Tacit knowledge is gained through experiences, it cannot be transferred and can only be illustrated or shown through actions (Tsoukas, 2003). For learning to occur, tacit knowledge needs to be interpreted and understood before being integrated (Becker-Ritterspach, 2006). Explicit knowledge, is knowledge that can be expressed, transferred and written down for the next person to learn from (Adenfelt & Lagerström, 2006b). Explicit knowledge tends to be more general, while tacit knowledge is more individual, and can potentially evolve into a competitive advantage. Tacit knowledge can make a worker more valuable, since the specific worker contribute with knowledge that is difficult for external actors to imitate (Yli-Renko et al., 2001). Hence, knowledge sharing and transfer knowledge effectiveness is especially challenging and important in international teams (Adenfelt, 2009).

Knowledge management (KM) is essential for an organization to take advantage of and create knowledge in a beneficial way. An early contribution to the concept defines KM as “the set of practices an organization applies to create, store, use and share knowledge” (Probst, 1998). Gasik (2011) collected various definitions from other scholar and decomposed the term KM into two categories. The first category looks at the single element of knowledge and thereby defines KM as a method to simplify and improve the process of transfer knowledge effectiveness. The other category focus on the overall knowledge and defines the term as a method to generate leverage and create competitive advantage, while managing knowledge sharing within the organization. KM is therefore acknowledged as a tool where knowledge is established, shared and integrated (Project Management, 2017). In the context of projects, project knowledge management (PKM) is necessary to guide, motivate and manage the knowledge capital, in order to accomplish the task (Johansson, Moehler, & Vahidi, 2013; Pereira & Goncalves, 2017). PKM connects the principles of KM and project managements (Johansson et al., 2013).

Projects are typically seen as temporary organizations and are differentiated from ordinary organizations by a diversely composed team aiming to solve a unique and specific task within a predefined time frame (Davis, 2009; Navimipour & Charband, 2016; NFP, 2018). International projects serve as a considerable staple of various industries, due to dynamic and global environments (Altman, Ghemawat, & Bastian, 2019; Bjorvatn & Wald, 2019). International projects are projects that spread over at least two countries and connects a team stemming from a minimum of two cultural backgrounds (Mesly, 2015). A common reason for using international projects is the need for unique specialized knowledge when solving a global task or developing

new products, processes or systems in multinational corporations. Typical challenges incurred by international projects is related to cooperation along with the geographical distance, language barriers, knowledge sharing, technological differences and cultural uniqueness (Adenfelt, 2009).

2.2 Project performance

The evaluation of project performance can be measured using the simple cost-time-quality triangle. The triangle gives an indicator if the project performed as planned, exploring the time and money spent, as well as the quality of the finished project (Adenfelt, 2009; Hoegl & Weinkauff, 2005; Sarin & Mahajan, 2001). Scholars have then increased the evaluation by adding a behavioral aspect to the calculation. By adding this aspect, they made it possible to look at other success factors of the completed project such as customer satisfaction and cross-cultural awareness (Popaitoon & Siengthai, 2014).

The evaluation of project performance is divided into short and long-term project success (Shrnhur, Levy, & Dvir, 1997). The short-term aspect refers to project completion, including the immediate and commercial success of the project, as well as the efficiency of the project. Whereas long-term evaluation focus on the social knowledge part, measuring the extent to which knowledge gained through one project can be transferred successfully to the next relevant project. If the knowledge is successfully transferred, then the timeline of the new project can be shortened (Popaitoon & Siengthai, 2014).

2.3 Social processes

Social processes have proven to positively affect project performance (Akgün et al., 2005; Ali et al., 2018). In this thesis, social processes are assumed to have an effect on project performance in an international context, as endorsed by Adenfelt (2009). Social processes can broadly be defined as assorted practices that can facilitate the creation of social capital within a group or organization (Ali et al., 2018; Yli-Renko et al., 2001). When looking at social capital, there is no consensual definition in economic theory. Usually, scholars create their own definition based on other influential theoretical scholars such as Bourdieu, Coleman or Putnam (Manning, 2015).

Bourdieu (1986) defines social capital as non-material goods at the disposition of the individual, such as schooling, cultural knowledge and language skills. Hence, the principle of

social capital theory is that relationship networks constitutes a valuable resource for the conduct of social affairs. Further, Bourdieu defines social affairs as durable accountability emerging from feelings of gratitude, trust, through mutual friendship and respect, or from the institutionally guaranteed rights derived from being part of a community. Social capital contributes to the collectivity-owned capital, cumulating trust (Bourdieu, 1986; Nahapiet & Ghoshal, 1998). Coleman (1990) argues that authority relations, trust and familiarity, through established norms, accumulates social capital. These social constructs are also viewed as cogent for cognitive and social development, resulting in improved knowledge sharing.

Putnam (1995) further develops the term and defines social capital as “features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit” (Putnam, 1995). Originally the mentioned scholars have done their research on social capital in social studies. In consequence, there are various interpretations of the concept, reflecting the multi-dimensional nature of phenomena that the concept inquires (Adler & Kwon, 2009; Manning, 2015).

Social processes can assist to increase the frequency and intensity of social interactions, resulting in more opportunities to exchange knowledge. As previously explained, the competitive advantage is often partly due to difficult-to-imitate capabilities entrenched in network and dyadic relationships. Social processes such as knowledge-sharing routines and efficient relational governance mechanisms into relationships, can influence the relational resources for knowledge acquisition and exploitation. These social processes may be critical for the long-term success of a project. Social relations enable a firm to cumulate the insight, width and efficiency of mutual knowledge exchange (Yli-Renko et al., 2001). Strong social processes in an international project is expected to increase the social capital, through knowledge creation, which again should result in a better performing project (Ali et al., 2018). Hence, the following hypothesis is established:

Hypothesis 1a: Social processes positively affect project performance

The knowledge development process includes individuals, groups and/or organizations, and is guided by the shared practices and routines and the existing knowledge. Knowledge develops through exploring new knowledge and working methods, while concurrently utilizing existing knowledge. This process entails personal interaction and communication. Knowledge sharing

is defined as the receipt or provision of knowledge created by the subsidiary sharing and receiving knowledge (Adenfelt & Lagerström, 2006a). Supported by knowledge creation theory, knowledge sharing is necessary for organizations in order to create value and generate organizational learning and effect the overall success of the organization. Furthermore, it can increase productivity and efficiency in team work, as well as inciting improved job performance for individual members working in a project (Navimipour & Charband, 2016).

An important enabler of knowledge sharing is knowledge culture, which addresses to what degree there is open knowledge sharing in a project (Adenfelt & Lagerström, 2006a). Knowledge culture includes mutual understanding and trust on both a personal and organizational level (Adenfelt, 2009). Management commitment act as a symbolic value as well as helping to motivate the team members, which will increase the confidence within the project. A well-structured project, through management, contributes to better descriptions and expectations for the team members (Gasik, 2011). Based on Adenfelt and Lagerström (2006a, 2006b), Adenfelt (2009) and Gasik (2011) findings, the following hypothesis is established:

***Hypotheses 1b:** Knowledge sharing in international projects positively affects project performance.*

The concept of transfer knowledge effectiveness has not received much scholarly attention, despite the influence it possibly has on project performance. Effectiveness, according to knowledge sharing, is a measure of the end use of the knowledge shared within a project or organization. Considering international projects; language, culture and geographical distance continuously challenge transfer knowledge effectiveness (Ambos, Ambos, Eich, & Puck, 2016; Bjorvatn, 2019; Luring & Klitmøller, 2015). Social interaction considerably enhances the effectiveness of knowledge-sharing practices, and the facilitation of information flow between organizational units. Collaboration between project team members contributes positively to knowledge exchange and the willingness to share knowledge. When both team members and decision-makers are willing to interact and cooperate toward a common project goal, the effectiveness of knowledge sharing will most likely increase (Ali et al., 2018). Based on Bjorvatn (2019) and Ali's (2018) findings, the following hypothesis is established:

***Hypothesis 1c:** Transfer knowledge effectiveness in international projects positively affects project performance.*

Familiarity refers to the degree of prior interaction between project group members (Akgün et al., 2005; DeChurch & Marks, 2001; Harrison, Mohammed, McGrath, Florey, & Vanderstoep, 2003). In general, familiarity makes room for higher levels of social interaction, resulting in overall better social processes within a project (Luhmann, 2000). A high degree of familiarity results in a significantly more successful knowledge sharing between individuals, compared to a low degree of familiarity (Adenfelt & Lagerström, 2006b). This is reasoned by the lack of cognitive structure development in a new composition of individuals. In addition, a high degree of familiarity reduces uncertainty and social acceptance anxiety during the project. By extension, it promotes personal cohesiveness and attraction, since team members spend less time acquiring members expertise and knowledge (Littlepage, Robison, & Reddington, 1997). Furthermore, familiarity promotes rapid integration and coordination and boosts mutual understanding (Akgün et al., 2005). Based on Akgün et al. (2005) and Adenfelt and Lagerström (2006a, 2006b) the following hypothesis is established:

Hypothesis 1d: Familiarity in international projects positively affects project performance.

Trust is another critical factor. Interpersonal trust refers to the degree a person is confident and willing to act on the basis of the actions, words and decisions of others (McAllister, 1995). Interpersonal trust is multidimensional, including both cognitive and affective based trust. The former refers to when individuals do what they promise in a timely and professional manner. The latter refers to emotional elements and social skills, including both care and concern, denoting how close the social relationship is within a team (Kanawattanachai & Yoo, 2002). The greater level of trust, the higher the level of accessibility, again resulting in higher probability of knowledge being transferred and shared within the team (Adenfelt & Lagerström, 2006b; Akgün et al., 2005; Koskinen, Pihlanto, & Vanharanta, 2003; Liang, Moreland, & Argote, 1995). Based on Akgün et al. (2005) and Adenfelt and Lagerström (2006a, 2006b) the following hypothesis is established:

Hypothesis 1e: Trust in international projects positively affects project performance.

Social processes have been accumulated and defined by knowledge sharing (Adenfelt, 2009; Gasik, 2011), transfer knowledge effectiveness (Ali et al., 2018; Bjorvatn, 2019), familiarity and trust (Adenfelt & Lagerström, 2006a, 2006b; Akgün et al., 2005). Presumably, other

factors may influence the relationship between social processes and international project performance in a negative manner. Based on previous research, complexity and national-culture diversity stands out as potential moderators on international project performance (Bjorvatn & Wald, 2018, 2019).

Projects are created for the explicit purpose of solving a complex task (Hobday, 2000). *Complexity* increases the demand for both knowledge management and coordination in the project, because complexity can weaken the ongoing knowledge process and lead to damage of knowledge exploitation in the final stage. Complexity can diminish the total effectiveness of the project (Arrow et al., 2000; Ilgen et al., 2005). International teams and projects are more affected by complexity than domestic teams. More nationalities within a team increase the overall complexity due to cultural diversity and geographical distance (Bjorvatn & Wald, 2018). The effect of project complexity on project performance is not broadly researched in an international context. Hence, the next hypothesis is established:

Hypothesis 2: Complexity moderates the relationship between social processes and project performance.

Based on theory, international projects should consider the diversity of nationalities and culture to be able to create common mutuality within the team (Bjorvatn, 2019). Culture can be defined as an interconnected, complex collection of interrelated and possibly interactive characteristics among a group of individuals. National-culture diversity refers to a group of individuals from various countries who hold different cultural values, attitudes and beliefs, and that vary in their norms and habits of communication (Lisak et al., 2016). Different approaches and working methods could lead to weak knowledge sharing (Adenfelt, 2009). A form of translation among team members is necessary to make sure messages are equally understood (Bjorvatn & Wald, 2019). The following hypothesis is created:

Hypothesis 3: National-culture diversity moderates the relationship between social processes and project performance.

The selection of media has an impact on the overall effectiveness of the project (Mesly, 2015). Effective communication is particularly challenging in international teams where face-to-face interaction is limited (Bjorvatn & Wald, 2019). Based on Lengel and Daft (1984) rich media

provides customized messages to personal circumstances, accommodated language variety and multiple information signals are simultaneously transmitted. In general, media richness refers to the capacity to process information through media, which is particularly important between project members to keep everyone continuously updated (Bjorvatn & Wald, 2019).

Along with the increased globalization, there has been an increase in information and communication technology, providing communicational support in dispersed teams (Jarvenpaa et al., 2004; Malhotra & Majchrzak, 2005). Because of the projects complexity, the use of media will be different and more important than in domestic teams (Malhotra & Majchrzak, 2014; Webster & Wong, 2008). Choosing the correct communication channel is imperative for high team performance, which contributes to the overall success. Theories as to what communication tools to choose has not kept pace with the accelerated advances in information, communication technologies and globalization (Bjorvatn & Wald, 2019). Based on Bjorvatn and Wald (2019) media richness can be defined within four mechanisms; face-to-face meetings, video conferencing, telephone and e-mail. Based on the importance of media in international projects, a mediating effect is probable, and establishes the following hypothesis:

Hypothesis 4: *Media mediates the relationship between social processes and project performance.*

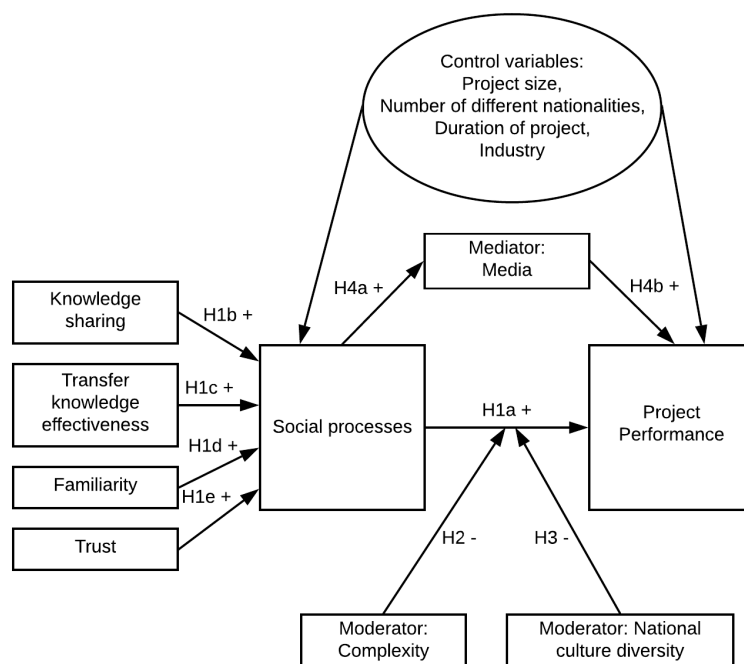


Figure 1: Conceptual model

Our conceptual model applies the theories of knowledge creation and social capital to explain how social processes affects international project performance (Manning, 2015; Nonaka, 1994). Knowledge sharing (Adenfelt, 2009; Adenfelt & Lagerström, 2006a, 2006b; Gasik, 2011), transfer knowledge effectiveness (Ali et al., 2018; Bjorvatn, 2019), trust and familiarity (Adenfelt & Lagerström, 2006a, 2006b; Akgün et al., 2005) all posit to positively contribute to project performance, which we intend to examine. Based on the mentioned scholar's findings and recommendations, as well as the established theory, the research model is created, see figure 1.

3. Methodology

In order to develop and validate our research findings, social science scholars have been using statistical analysis tools for a long period of time. It was not until the 1990s the second-generation methods started to emerge, as a response to the weaknesses to the techniques of the first-generation. Partial least square structural equation modeling (PLS-SEM) is one of these second-generation tools and establishes the foundation for this thesis. The following chapter describes the chosen research design and how it is applied in the research. This research examines if social processes have any effect on project performance in international projects (Hair, 2016).

A quantitative research design is applied in order to get a representative sample of the population. The design of the research model is a combination of both exploratory and confirmatory research. Exploratory applications explore data patterns and tries to identify significant relationship, with a small amount of information regarding the interlinkages. Confirmatory applications, on the other hand, aim to empirically examine already established models and theories. The hypotheses presented in this thesis are based on preliminary theory, while at the same time exploring variables with limited prior knowledge, searching for new latent patterns. Hence, both the exploratory and the confirmatory application is applied. By adding a new combination of variables to our conceptual model, we intend to develop new theories with the use of PLS-SEM (Hair, 2016).

Hypotheses are individual conjectures based on preliminary supporting evidence. They are used to test the predicted findings in the empirical data. When developing the hypothesis, the alternative hypothesis states a directional relationship, while a null hypothesis is set up to be rejected, stating no relationship between the variables (Sekaran & Bougie, 2016). By rejecting

the null hypothesis, one can confirm or develop theories, which provides useful information (Bryman & Cramer, 1994).

Significance testing is the process of establishing if the results have occurred by chance or if it is true to its population. In the context of PLS-SEM it involves considering whether the path coefficients are truly different from zero in the means of the population, while also considering their direction. A predefined significance level needs to be established in order to reject the null hypothesis of no effect. In this study a p value of no more than 0.025 is required in order to accept the alternative hypothesis and reject the null hypothesis. p values represents the ability of error for assuming that a specific path coefficient is significantly different from zero (Hair, 2016).

The dependent variable intends to describe and understand the variable (Sekaran & Bougie, 2016). Project performance is defined as the dependent variable in this study. When utilizing PLS-SEM, the dependent variable is referred to as the endogenous latent variable (Hair, 2016). The independent variable accounts for the variances that is found in endogenous latent variable (Sekaran & Bougie, 2016). Social processes (Ali et al., 2018), formed by knowledge sharing (Adenfelt, 2009; Adenfelt & Lagerström, 2006a, 2006b; Gasik, 2011), transfer knowledge effectiveness (Ali et al., 2018; Bjorvatn, 2019), familiarity and trust (Adenfelt & Lagerström, 2006a, 2006b; Akgün et al., 2005), act as independent variables in our model and is further referred to as exogenous latent variables (Hair, 2016).

As previously mentioned, our conceptual model includes a mediating variable. A mediator effect occurs when a third variable interferes between two other related variables, giving an assumption to the underlying processes or mechanisms explaining the relationship between the variables (Nitzl, Roldan, & Cepeda, 2016). Media establishes the mediating variable between social processes and project performance. Both an indirect mediating effect through media, as well as a direct mediating effect between social processes and project performance are expected by the use of media (Hair, 2016). Additionally, the research model includes two moderating variables; complexity and national-culture diversity. A moderating effect occurs when the moderating variable changes the direction or the strength of a relationship between exogenous and endogenous variables in the model (Hair, 2016; Sekaran & Bougie, 2016).

The conceptual model includes four control variables, project size, number of different nationalities, number of different languages and duration of the project. The control variables are used to control the robustness of our results, making sure the potential significant results are not spurious (Spector & Brannick, 2010).

3.1 Sample and data examination

When applying PLS-SEM, there are several key characteristics when considering the data set. Large sample sizes increases the precision of the estimates, one can generally achieve good statistical measures with small sample sizes in PLS-SEM, as well as no identification issues (Goodhue, Lewis, & Thompson, 2012). PLS-SEM is a nonparametric method, which means it makes no distributional assumptions. As long as the missing values are below a reasonable level, the data should be highly robust. One could experience some limitations by the use of categorical data, when measuring endogenous latent variables, but the method works well with metric data, ordinal data and binary coded variables (Hair, 2016).

A common obstacle when utilizing an online survey are missing data. Missing data appears when the respondents fail to answer one or more questions in the survey. A force-answer approach can be applied, where the respondents are forced to answer all the questions before proceeding to the next category in the survey. The forced-answer approach can also have the opposite affect and motivate some individuals to discontinue or provide misleading answers in the survey. If the percentage of missing data rises above 15%, the responses with missing data must be deleted before starting to analyze. There are three ways of handling missing data over 15% in the SmartPLS software; mean value replacement, pairwise deletion or listwise deletion. Mean value replacement replaces the missing values of an indicator with the mean of valid measures. Pairwise deletion includes all cases, generating measures based on different sample sizes. Listwise deletion is used to remove all cases with missing values. If the cases with missing data were to be included, it would result in different calculations based on different sample sizes, which can bias the results (Hair, 2016).

Next, suspicious response patterns in the data set needs to be considered. Suspicious response patterns can be described as straight lining, diagonal lining or alternating extreme pole responses. Straight lining happens when the respondent marks the same response in a large proportion of the questions. Answers with the same response rate, from the same respondent,

should be deleted. Responses only using extreme alternatives should also be deleted in order to get the most accurate results. Screening questions can prevent suspicious response patterns, assuring respondents meet the prescribed criteria for the sample group (Hair, 2016).

Outliers is an extreme reply to a particular question, or to all questions in the survey. There are multiple reasons for outliers to occur. It can happen due to data collection entry error, where the wrong number is implemented in the analysis. It can appear naturally or occur when value combinations of construct are especially rare. A 5-point Likert scale is applied to the survey, making sure outliers are excluded from the responses. However, outliers may occur in questions where participants write their own answers. The outliers need to be identified before evaluating their impact on the results of the analysis (Hair, 2016).

Common method bias is a systematic error that challenges the validity of the empirical data (Bjorvatn & Wald, 2019). To assess the potential problems related to common method bias, one can run a full collinearity assessment, where path collinearity problems are tested. If the resulting factor-level variance inflation factors (VIFs) falls below 3.3, the model should be free from common method bias (Schnellbacher, Heidenreich, & Wald, 2019). Another method to check for common method bias is the Harman's single factor test. All constructs are tested in an exploratory factor analysis, searching for relationships between the variables in order to reduce a great number of variables, to a reduced set of composite factors. The conclusive set of composite factors is an outcome of exploring the relationships in the data, describing the relationships found, if any (Hair, 2016). Common method bias is present if one single factor accounts for the majority of covariance among the measures. Cumulative values of less than 50% indicates no common method bias in the dataset (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003).

Non-response bias is common when using mail surveys. It refers to a possibility of differences in the group of people responding to the survey and those who does not. The recommended method of dealing with nonresponse bias is to reduce the nonresponses and keep it under 30% by sending out a reminder to the participants. Extrapolation method is another approach in order to reduce nonresponses. This method is based on the assumption that there are differences in early and late respondents, and that late responses are expected to be similar to non-respondents. Late respondents are those who only respond after increased stimulus, being reminded about the survey. To test for nonresponse bias, the dataset is divided into two waves;

early and late respondents. The data includes nonresponse bias if there are considerable differences in the mean and significant values between the two selected groups. An independent sample t-test is used to confirm that the significance of the two-tailed t-test is similar for both early and late respondents, verifying that the dataset is free from nonresponse bias (Armstrong & Overton, 1977).

3.2 Partial least squares structural equation modeling (PLS-SEM)

PLS-SEM provides several beneficial model characteristics. It can handle both single and multi-indicator constructs, and one can easily incorporate both reflective and formative measurement models. In addition, it handles complex models with several structural model relations (Hair, 2016).

Based on the theoretical foundation and the developed research model, a multivariate analysis is applied. PLS analysis is a multivariate statistical approach that enables comparison between multiple explanatory variables and multiple response variables. It explores the linear relationships between multiple exogenous variables and a single or multiple endogenous variable, through a regression-based approach. SEM is a multivariate statistical analysis used to analyze structural relations. This technique combines factor analysis and multiple regression analysis. It can be utilized to analyze the structural relationships between latent constructs and measured variables. PLS-SEM is the preferred method to use when the research objective is theory development and explaining variance among constructs. PLS-SEM estimates coefficients widening the R^2 values of the targeted exogenous variables. There are five important elements to consider using this multivariate analysis; the variate, measurement, measurement scale, coding and data distribution (Hair, 2016).

The variate is a linear combination of the predefined variables chosen based on the research question. The combination process involves multiplying the variables with a set of weights and summing them (Hair, 2014). In this research the linear combination is shown as follows:

$$\text{Variate value} = \text{KS} * w_1 + \text{TKE} * w_2 + \text{F} * w_3 + \text{T} * w_4 = \text{SP} * w_5$$

The measurement of latent variables is the process of assigning them numbers, based on a set of rules. Latent variables are the unobserved theoretical elements in the structural model. A

latent variable with at least one incoming relationship in the structural model is called endogenous, while one that only explains other latent variables is referred to as exogenous. Assigning numbers to the variables helps to accurately represent them. Abstract concepts are more difficult to measure than categorical measures. By utilizing indirect measurement with a set of indicators serving as proxy variables, the overall concept becomes more accurate. A Likert scale is applied in this research. Considering the use of equidistant categories, the coding can be considered as interval data, making it possible to use SEM. (Hair, 2016).

PLS-SEM makes no assumptions regarding the data distribution. It is still recommended to assess whether the data are normal. Both the Kolmogorov-Smirnov test and Shapiro-Wilk test along with skewness and kurtosis are potential assessment tools. The Kolmogorov-Smirnov test and Shapiro-Wilk test provide limited guidance in consideration of data normality; hence skewness and kurtosis are advised. Skewness is a measure of asymmetry in a frequency distribution, examining if the variable stretches towards one of the outer tails in the distribution. It measures a variables extent of symmetry around its mean value. An indication of skewed distribution occurs when the mean value is greater than plus one or lower than minus one. Kurtosis measures the quality of peakedness or flatness of the curve describing a frequency distribution. The data distribution is peaked if the value is greater than one, conversely a value below minus one indicates a flat data distribution (Hair, 2016).

Measurement theory and structural theory are required to develop path models. Measurement models are used to organize latent variables by a set amount of indicator variables. The indicators represent the available data from the survey (Hair, 2007). Measurement models are referred to as the outer model in PLS-SEM. A formative measurement model is connected from the indicators to the latent variable and considered error free. A reflective measurement model has connections from the latent variable to the indicators (Diamantopoulos, 2011; Hair, 2016), as well as having an error term associated with each indicator (Hair, 2016).

Both reflective and formative measurements are employed in our conceptual model. Reflective measures represent the effects of an underlying construct. This model imply that the indicators are caused by the same construct, which should be supported by the highly intercorrelated indicators. All indicators will change simultaneously if the evaluation of the latent trait changes. Formative measurement models assume the indicators cause the construct. Thus, every indicator captures a particular aspect of the constructs domain. Structural theory

considers the structural model, which represents the conceptual or theoretical element of the path model. This model is also referred to as the inner model in PLS-SEM and includes the latent variables and their respective path relationships. In other words, the structural model gives a visual display of the hypotheses and relationships between the constructs (Hair, 2016).

PLS-SEM algorithm is the heart of this method. Based on the path model and the available indicators, the algorithm estimates scores for all indicators available. This also includes the latent variables serving as estimates for all path model relationships. The primary goal of PLS-SEM is to achieve as high predictors as possible, also denoted as R^2 . The measurement shows the amount of variance explained by the endogenous latent variable in the structural model. The higher the R^2 measures, the better the construct is explained by the latent variables. The algorithm is particularly efficient in the way it converges after few iterations to achieve the optimum solution. Construct scores are estimated as linear combinations of their respectable indicators, which is used for predictive purposes. In addition, good measures indicate that the construct can be well predicted through the PLS path model (Hair, 2016).

Path coefficients, also denoted as β , represent the relationship between latent variables in the structural model. This measure can be used to interpret the degree of affection between the variables (Hair, 2016). To evaluate the overall fit of the measurement model the standardized root mean square residual (SRMR) is considered. The SRMR measures the absolute fit and is defined as the standardized difference between the predicted correlation and the observed correlation. Hence, a value of zero reveals perfect fit. In general, a value less than 0.08 is considered a good fit (Hu & Bentler, 1999).

Assessing the results of reflective measurement models includes several criteria. First, internal consistency reliability estimates the individual reliability of the indicators. Cronbach's alpha is the more traditional estimate of reliability with the assumption of all variables being equally reliable. Composite reliability (ρ_c) incorporates the different outer loadings of the indicator variables, which determine the indicators absolute contribution to its allocated construct. Both reliability measures are interpreted equally; values of 0.6 – 0.7 are acceptable and 0.7 – 0.9 are satisfactory. Higher and lower measures indicates redundancy or lack of internal consistency reliability, respectively (Hair, 2016).

Second, convergent validity measures to what extent two constructs, that theoretically is correlated, are in fact correlated. The outer loadings of the indicators along with the average variance extracted (AVE) is considered to establish convergent validity. The outer loadings should all be statistically significant, with a rule of thumb of a measure of 0.708 or higher, while measures from 0.4 – 0.708 should be evaluated, and measures below 0.4 being immediately deleted from the construct. AVE is the mean value of the squared loadings of the indicators related to the construct. An AVE value of 0.50 or higher indicates that the construct, on average, explains more than 50 percent of the variance of its indicators. Conversely, measures exhibiting below 0.50 indicates more errors in the items than variance explained by the construct (Hair, 2016).

Third, discriminant validity establishes the uniqueness by empirical standards. Discriminant validity can be measured by the heterotrait-monotrait ratio of correlations (HTMT). If the results are unsatisfactory, the results confirming hypothesized structural paths cannot be considered valid. The HTMT criterion outperforms the more classical approaches such as Fornell-Larcker criterion, which is largely unable to detect lack of discriminant validity (Henseler, Ringle, & Sarstedt, 2015). If the values are above 0.9 it means there is a lack of discriminant validity (Hair, 2016).

Contrastingly to reflective indicators, high correlations are not expected among formative measures. Collinearity refers to high correlation between two formative indicators. Multicollinearity refers to high correlations between more than two indicators. Collinearity issues are crucial due to the impact on the estimation of weights and their statistical significance. These issues are particularly problematic with smaller samples providing generally larger standard errors due to sampling error. In addition, it could incorrectly estimate the weights. To assess collinearity the tolerance level needs to be considered. Tolerance expresses the volume of variance of one formative indicator not explained by the other indicators within the same block. A related measure is the variance inflation factor (VIF), which is the reciprocal of tolerance. A high level of collinearity is indicated by a tolerance level of 0.20 or lower and a VIF value of 5 or higher. Constructing higher-order constructs are one option to treat these issues, which will be further discussed in chapter 4.3 (Hair, 2016).

Next, the significance and relevance of formative indicators should be considered. The values of outer weights can be compared and used to determine each indicators relative contribution

(relative importance) to the construct. The key question is whether the formative indicators actually contribute to forming the construct or not. This is true if the outer weights are significantly different from zero, by the means of the bootstrapping process. Bootstrapping is a resampling method that randomly draws a considerable number of subsamples from the original data set with replacement, and estimates models for each subsample. It is utilized to determine standard errors of coefficients assessing their statistical significance without relying on distributional assumptions. p values indicates the indicators weight significance. If the weights prove to be insignificant, the outer loadings should be considered before eliminating the respectable indicator. If the respectable indicator has an outer loading falling under 0.5, it should be deleted from the construct. To deal with a potentially large number of indicators, a second-order construct is proposed as a solution (Hair, 2016).

3.3 Hierarchical component model

A hierarchical component model (HCM) is a higher-order structure containing assorted layers of constructs and involves a higher level of abstraction. Normally, HCM contains a more abstract higher-order component (HOC) in relation to two or more lower-order constructs (LOCs). The LOCs captures the subdimensions of the conceptual entity, in a formative or reflective way. In this thesis, the HCM consist of four formative LOCs and one reflective HOC. The formation is done through a bottom-up approach where several latent variables information are combined into one more general single construct (HOC). By establishing HCM, the number of relationships in the structural model is reduced, making the PLS path model more parsimonious and simpler to grasp. In addition, HCM is valuable if formative indicators indicate high levels of collinearity (Hair, 2016).

Mediation concentrates on both the direct relationship between the HOC and the endogenous variable, as well as an additional theoretically relevant component which indirectly provides information on the direct effect via its indirect effect. In other words, the indirect relationship through the mediator affect the direct relationship between the HOC and the endogenous variable (Hair, 2016).

There are several technical and empirical conditions to be met when including a mediator in the model. Zhao, Lynch and Chen (2010) identifies two types of non-mediation and three types of mediation that can occur. Non-mediation is when the direct effect between the constructs

are significant and the indirect effect is insignificant or if neither of the effects are significant, giving direct-only effect or no effect, respectively. Mediation can be found in three different ways. First, a significant indirect effect gives indirect-only mediation. Second, significant indirect and direct effects pointing in contrary directions, affirms competitive mediation. Third, significant indirect and direct effects pointing in the same direction, gives complementary mediation. This theory adds to the previous concept by Baron and Kenny (1986), that there can be partial mediation or full mediation.

Following Zhao, Lynch, and Chen's (2010) mediating test, the sampling distribution of indirect effect is bootstrapped. Bootstrapping opens up to deal with small sampling sizes with more confidence and is perfectly suited for PLS-SEM. To test for different types of mediation, multiple analysis should be conducted. First, the significance of the indirect effects needs to be address. If the indirect effects are insignificant, the chosen construct does not function as a mediator in the tested relationship. If this is the case, the direct effect between the constructs needs to be investigated, to test for omitted mediators. If there is a significant direct effect only, it is potentially an omitted mediator. An omitted mediator could explain the relationship between the two constructs. If either of the direct and indirect effect is significant, one can conclude that there are flaws in the theoretical foundation that is established (Hair, 2016).

Moderation occurs when a third variable moderates the relationship between the exogenous and endogenous variable. A moderator can change the strength or direction of a relationship between two constructs and is divided into categorical and continuous moderator constructs. Categorical moderators dichotomize the data set in order to conduct a multigroup analysis. This analysis should provide measures indicating where the structural model relationships significantly differs from one another and is used on all model relationships. Continuous moderators are when one assumes the moderator has an effect on the strength of a specific already established relationship. If the moderating effect turns out to be insignificant, the previously established relationship is to be considered constant. Based on the measurement and measurement scale in this thesis, continuous moderators are assumed (Hair, 2016).

The moderating effect is included twice in the measurement model; in the moderator construct as well as in the interaction term in order to amplify the limitations of single-item measurement. There are three approaches to examine the moderating effect; product indicator approach, orthogonalizing approach and two-stage approach. Product indicator approach is not applicable

when the exogenous construct and/or the moderator are measured formatively. Orthogonalizing approach can equally only be used if the exogenous construct and the moderator construct is measured reflectively. Contrary, the two-stage approach is examined when the exogenous construct and/or the moderator is measured formatively. In this research, social processes are measured formatively, and the moderator effects are measured reflectively (Hair, 2016).

3.4 Measurement error

Measurement error is the difference between true value and value obtained by a measurement. Random error, or unsystematic error, has no patterns and occur naturally. Unsystematic error is unavoidable, and a certain degree of error is expected in this research. Systematic error, or systematic bias, is repeatable and consistent error related to a flawed experiment design. This can include incorrect collection or measures of the data. Systematic and unsystematic error comprise the measurement error (Trochim, 2001).

When utilizing multivariate analysis, some measurement error is expected. Multivariate measurement enables a more precise identification of measurement error. The measurement error can include both systematic and random sources. The random source threatens the reliability, while the systematic source threatens the validity of the results. One concern using multivariate analysis is to ensure measurement equivalence. Failing to establish data equivalence indicates a potential source of measurement error. Errors result in discrepancies between intended and actual measures. Valid model relationships are demonstrated through equivalent measures. The degree of validity reflects on the difference between the average value and the true score, the smaller difference the higher validity (Hair, 2016).

Systematic error must be addresses when considering the research design and collection method. Error can occur due to misinterpreted questions in the survey, increasing the overall measurement error. Another potential systematic error are misunderstandings or interpretations of the measurement scaling. Systematic error is minimized by using one approach with consistent alternatives. Incorrect application of statistical methods is another potential systematic error. The statistical SmartPLS software, as well as IBM SPSS Statistics, are utilized to compute the measures, reducing the error considerably. Furthermore, PLS-SEM bias refers to relationships in the structural model being somewhat underestimated and relationships in the

measurement model somewhat overestimated. This is normally accepted by scholars and is negligible in nearly all settings encountered in empirical research (Hair, 2016).

4. Analysis and results

4.1 Data examination

To collect data, a web-based survey based on previously established questions was distributed to industries with connections to international projects (see Appendix A). To ensure that the participants had relevant experience in international projects, they were asked if they had worked in an international project, as an initial screening question. The participants were also asked to inform how many nationalities and participants the project teams included, as an extra control regarding the degree of internationality, limiting potential response bias.

The survey was sent to 415 participants from companies within construction, consulting, oil and gas, research and engineering. Companies with offices in multiple countries were targeted, as well as listed projects. The survey was sent out to both project managers and project participants, all asked to give their subjective opinion on their last international project experience. The survey was distributed in English to all potential participants. Every participant was approached twice; the initial distribution mail, as well as a reminder after two weeks.

148 participants responded to the survey, and 106 fully completed responses were collected, which gave an overall response rate at 26%. Out of the collected responses 102 were valid and could be used in the analysis. No critical numbers were found when analyzing the screening questions for outliers, and no suspicious response patterns were found. The average size of the project team was 94 participants, average variety of nationalities within the project was 8, and the average duration of the projects were 22 months. A majority of responses came from the oil and gas industry, with remaining participants divided among residual industries, see table 1.

Industry	Oil and gas	Consulting	Research	Construction	IT
	50%	20%	19%	6%	6%

Table 1: Industry weights

We received 42 responses with missing values, which is equivalent to 10%. Based on theory, we were not required to delete any data (Hair, 2016), however, since the missing data was

particularly prominent after the screening question ($\approx 80\%$), the data was still deleted (see Appendix B). The data was deleted using casewise deletion, removing all responses with missing values before conducting the analyses, in order to get an even number of responses across all indicators. The dataset was then tested for common method bias using a full collinearity approach and Harman's single factor test. The factor-level VIF were all below 3.3 which indicates no common method bias, see table 2. The Harman's single factor test gave a cumulative percentage of 24, once again confirming no common method bias (see appendix C).

Construct label	Variance inflation factor (VIF)
Knowledge sharing < 1.268	
s_5	1.201
s_12	1.268
s_14	1.208
Transfer knowledge effectiveness < 2.506	
s_15	1.771
s_16	1.894
s_17	2.082
s_18	2.506
Familiarity < 1.323	
s_19	1.323
s_20	1.323
Trust < 2.024	
s_22	2.024
s_23	1.935
s_24	1.640
s_25	1.989
s_26	1.944
Project performance < 1.851	
s_40	1.726
s_42	1.626
s_43	1.587
s_44	1.851
s_45	1.829

Table 2: Common method bias

Next, we tested for nonresponse bias. The data was divided into two groups, early and late responses, where late responses defined as contributions provided upon receiving a reminder by email. By doing an independent sample t-test in IBM SPSS Statistics, we found that the

significance numbers between the early and late responses were quite similar, stating that there is no nonresponse bias in the data, see table 3.

Project Performance	Wave	Sig. (p value)	Mean	Std. Error
s_40	Early	0.453	0.102	0.135
	Late	0.475	0.102	0.142
s_42	Early	0.119	(0.307)	0.195
	Late	0.112	(0.307)	0.192
s_43	Early	0.005	(0.538)	0.186
	Late	0.004	(0.538)	0.181
s_44	Early	0.277	0.159	0.146
	Late	0.310	0.159	0.156
s_45	Early	0.896	(0.019)	0.144
	Late	0.899	(0.019)	0.149

Table 3: Nonresponse bias

Before assessing the measurement model, we examined the data distribution for kurtosis and skewness. When testing for skewness and kurtosis we found that the average value for skewness was -0.692, and kurtosis had an average of 0.891, indicating that the distribution is close to normal (see appendix D).

4.2 Measurement model

In this model, knowledge sharing, transfer knowledge effectiveness, familiarity and trust represents the subdimensions (LOCs) of social processes (HOC), through the repeated indicator approach. The measurement model is reflective-formative, with reflective LOCs and formative HOC (Hair, 2016).

To make sure the data used in the reflective model were valid and reliable we conducted several tests. The first criterion tested was internal consistency reliability. All first-order construct had acceptable or satisfactory Cronbach's alpha (> 0.661), with only satisfactory measures of composite reliability (> 0.786), see table 4. Hence, supporting internal consistency reliability for all first-order constructs.

Next, convergent validity was tested by estimating the AVE. Transfer knowledge effectiveness and familiarity exceeded the benchmark of 0.5, while the residual constructs had to be evaluated. The outer loadings were considered, whereas values performing below ≈ 0.6 were

deleted from the construct, see table 4 (the insignificant numbers are denoted in bold and italic in the table).

First-order Construct	Cronbach's alpha	Composite reliability	AVE		Outer loadings				
Knowledge sharing	0.734	0.786	0.288	s_5	0.594				
				s_6	0.466				
				s_7	0.372				
				s_8	0.523				
				s_9	0.270				
				s_10	0.362				
				s_11	0.459				
				s_12	0.800				
				s_13	0.566				
				s_14	0.722				
				Transfer knowledge effectiveness	0.842	0.889	0.669	s_15	0.750
								s_16	0.755
								s_17	0.870
								s_18	0.888
Familiarity	0.661	0.819	0.704	s_19	0.679				
				s_20	0.974				
Trust	0.792	0.849	0.427	s_21	0.480				
				s_22	0.779				
				s_23	0.794				
				s_24	0.786				
				s_25	0.662				
				s_26	0.649				
				s_27	0.203				
Project performance	0.807	0.836	0.467	s_40	0.581				
				s_41	0.431				
				s_42	0.700				
				s_43	0.802				
				s_44	0.683				
				s_45	0.727				

Table 4: Internal consistency reliability and convergent validity before deletion

After the elimination process, all first-order constructs exceeded the benchmark of AVE above 0.5, as well as maintaining acceptable and satisfactory reliability measures, see table 5.

First-order Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Knowledge sharing	0.616	0.784	0.553
Transfer knowledge effectiveness	0.842	0.889	0.669
Familiarity	0.661	0.819	0.701
Trust	0.792	0.856	0.545
Project performance	0.793	0.846	0.526

Table 5: Internal consistent reliability and convergent validity after deletion

The last step when validating the reflective measurement model was discriminant validity. After conducting the PLS algorithm, we looked at the HTMT measures. Since all numbers fell below 0.9, the constructs were confirmed unique, only capturing the phenomena through one construct, see table 6.

	Familiarity	Knowledge sharing	Project performance	Trust
Knowledge sharing	0.420			
Project performance	0.210	0.367		
Trust	0.189	0.608	0.433	
Transfer knowledge effectiveness	0.096	0.531	0.321	0.555

Table 6: HTMT first-order constructs

Next, the formative higher order construct of social processes was analyzed to check the fit. First, bootstrapping was employed to test the significance of the estimated higher order weights. The outer weights capture the relative importance of the total scale of the second order variable. The analysis presented insignificant results from the lower order construct familiarity and transfer knowledge effectiveness. The outer loadings were considered in respect to the insignificant indicators. Familiarity's insignificant indicator provided an outer loading of < 0.5 , which resulted in it being eliminated from the higher order construct. Transfer knowledge effectiveness showed values exceeding the benchmark of 0.5, which means it was further included in the model, see table 7 (insignificant numbers are denoted in bold and italic). The weights, as well as the significant levels, indicates that the remaining lower order constructs significantly contributed to the higher-order construct (Hair, 2016).

Second-order Construct	First-order Construct		Weights	Sig. (<i>p</i> value)	Outer loadings	
Social processes	Knowledge sharing	s_5	0.126	0.005	0.553	
		s_12	0.215	0.000		
		s_14	0.184	0.000		
	Transfer knowledge effectiveness	s_15	0.129	0.000		
		s_16	0.041	0.116		
		s_17	0.183	0.000		
	Familiarity	s_18	0.101	0.011		
		s_19	0.073	0.116		0.236
		s_20	0.132	0.007		
	Trust	s_22	0.085	0.011		
		s_23	0.150	0.000		
		s_24	0.130	0.000		
s_25		0.062	0.018			
s_26		0.150	0.000			

Table 7: HOC weight and significance value

Next, multicollinearity between the formative indicators were tested based on the VIF for the HOC. The highest value calculated was 3.18 (see Appendix E). Hence, there was no multicollinearity between the formative indicators, and the model could be further examined on a structural level.

4.3 Structural model

After the measurement models were tested, the structural model and hypotheses were measured by calculating the coefficients and *p* values. The results fit the data well, with an SRMR of 0.062. As in the measurement model, the VIFs were measured, indicating no multicollinearity at a structural level (see Appendix E).

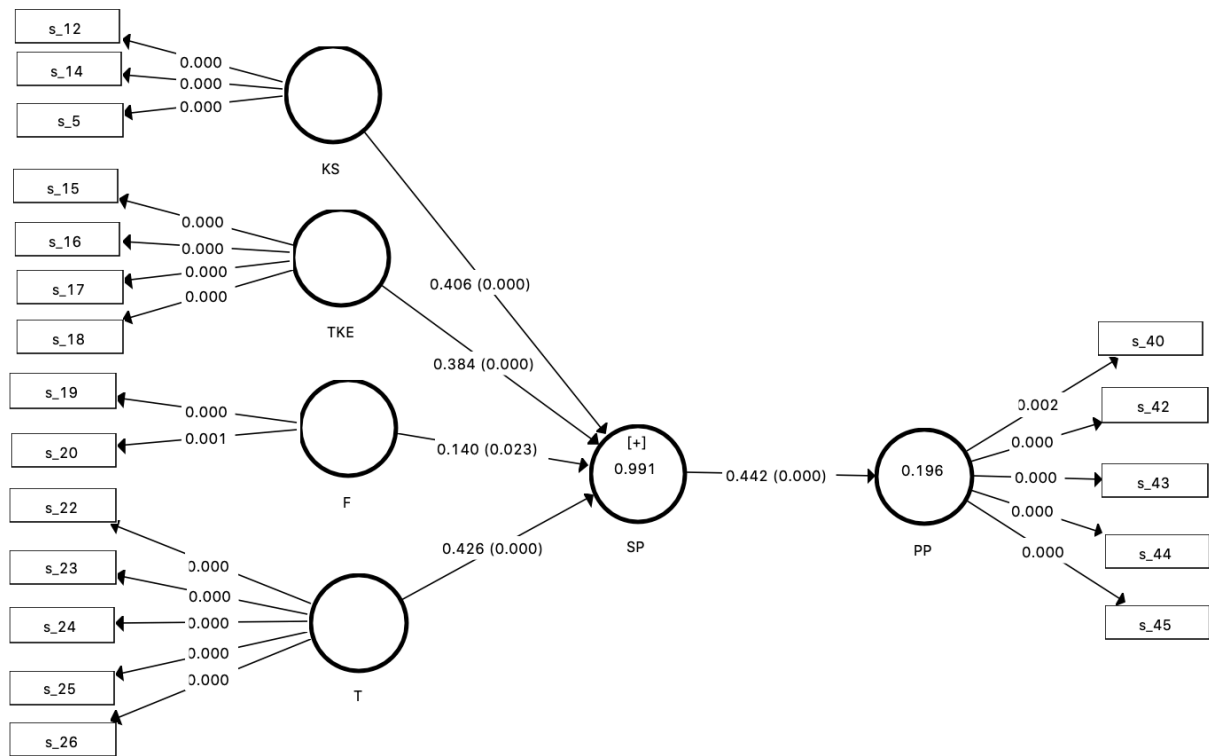


Figure 2: Structural model results including LOCs

Based on our results, as shown in figure 2, knowledge sharing (KS) positively affect international project performance (PP) ($\beta = 0.41, p < 0.01$). In line with hypothesis 1b, transfer knowledge effectiveness (TKE) positively affect international project performance ($\beta = 0.38, p < 0.01$). Familiarity (F) also positively affect international project performance ($\beta = 0.14, p < 0.025$). Trust (T) positively affect international project performance ($\beta = 0.42, p < 0.01$). Based on the path coefficients, trust and knowledge sharing have the highest impact on social processes, and again on project performance, while familiarity exhibits the lowest affection on social processes and project performance. The numbers inside the endogenous and exogenous construct represents their R^2 values. Hence, when including the LOCs in the structural model the endogenous latent variable achieves an R^2 value of 19.6%.

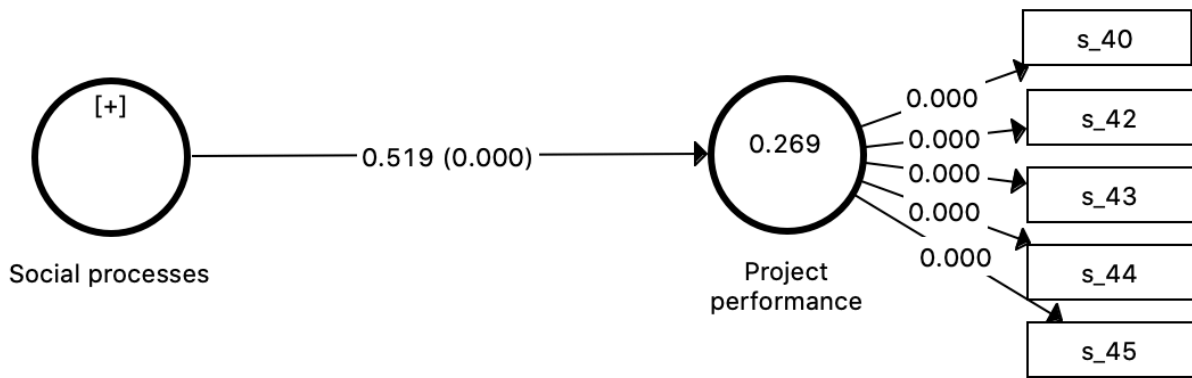


Figure 3: Structural model

Following Becker, Hwa, Ringle, Sarstedt & Hair (2019) checklist for using higher-order constructs, we do not consider the lower-order components as elements of the structural model from this point on. In line with the significant hypotheses mentioned above, social processes (SP) positively affect international project performance, as shown in figure 4 ($\beta = 0.519, p < 0.01$). The structural model gives an R^2 of approximately 27%, which is a considerable increase from when including the LOCs. In sum, hypotheses 1a through 1e were all significant, and we can reject their respectable null hypotheses.

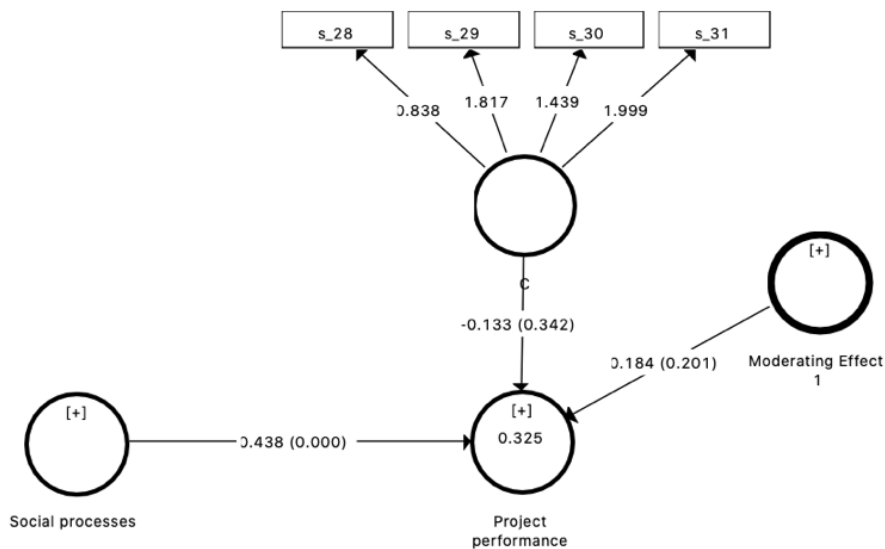


Figure 4: Moderating effect, complexity

Figure 4 exhibits the results when including complexity as a moderator. The p value is calculated to 0.201, which is far from our predefined significant value requirement of 0.025. Hence, we are unable to reject the null hypothesis, and to argue that there is any moderating relationship between complexity and international project performance. This means that the previously established relationship between social processes and project performance is to be considered constant.

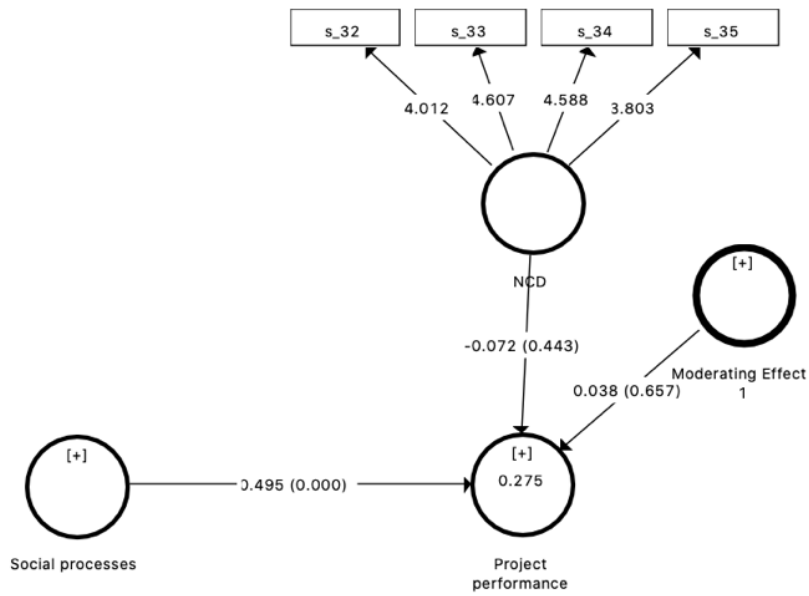


Figure 5: Moderating effect, national-culture diversity

Figure 5 exhibits the results when including national-culture diversity as a moderator. The p value exhibits a remarkably high measure (0.657), which means we are unable to reject the null hypothesis and to establish a moderating relationship between national-culture diversity and international project performance. Hence, the previously established relationship between social processes and project performance is to be considered constant.

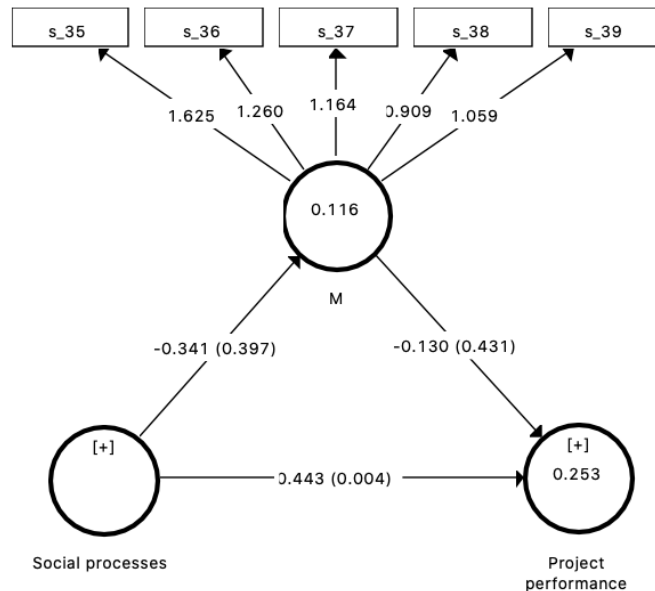


Figure 6: Mediating effect, media

The indirect effects through media is insignificant, which means there are no mediation based on our empirical evidence. The p value in relation to social processes and media is 0.397, while

the relationship between media and international project performance exhibits a p value of 0.431, see figure 6. Hence, we are unable to reject the respectable indirect null hypothesis and are unable to argue that there is any mediating effect. Next, the relationship between the exogenous and endogenous is still significant (0.004), meaning we have a direct-only effect, with potentially explanatory omitted mediators.

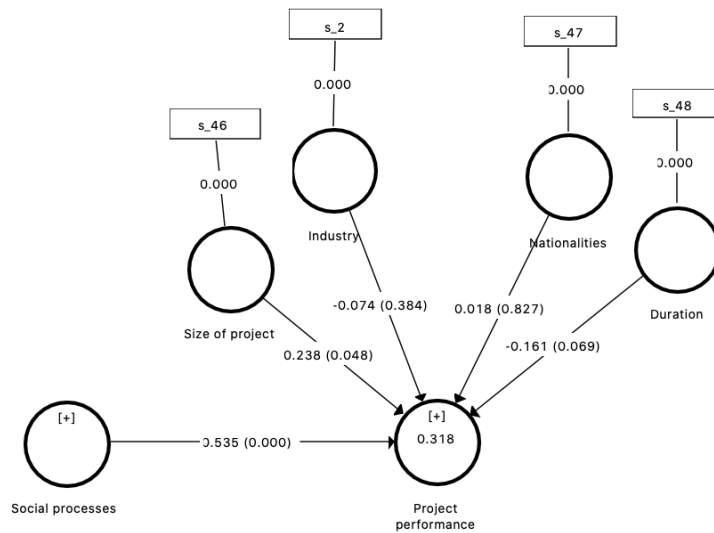


Figure 7: Control variables

To test the robustness of our findings, we included four control variables (size of project, industry, how many nationalities and duration of project). As mentioned, we require a p value of 0.025 or lower in order to reject the null hypotheses. As shown in figure 7, none of the control variables meet this requirement, which indicates our findings being relatively robust.

Our results are presented in table 7. The insignificant findings are denoted in italic and represents the hypotheses we are unable to reject.

Hypotheses		β coefficient	Sig. value (P)
Structural model			
Social processes affect project performance		0.519	< 0.01
Knowledge sharing in international projects positively affects project performance		0.406	< 0.01
Transfer knowledge effectiveness in international projects positively affects project performance		0.384	< 0.01
Familiarity in international projects positively affects project performance		0.140	< 0.01
Trust in international projects positively affects project performance		0.426	< 0.01
Moderators and mediator			
Complexity moderates the relationship between social processes and project performance		<i>0.184</i>	<i>0.201</i>
National-culture diversity moderates the relationship between social processes and project performance		<i>0.038</i>	<i>0.657</i>
Media mediates the relationship between social processes and project performance	H4a	<i>(0.341)</i>	<i>0.397</i>
	H4b	<i>(0.130)</i>	<i>0.431</i>

Table 8: Hypothesis, results

5. Discussion

International projects continue to emerge as a response to the dynamic and complex business environments (Bjorvatn & Wald, 2019; Mesly, 2015). Empirically, a well-functioning team has proven to be positively correlated to project performance (Brucks, Reips, & Ryf, 2007; Mesly, 2015; Yang, Huang, & Wu, 2011). The aims of this study have been to (1) empirically assess the effect of social processes on project performance and (2) assess whether complexity and national-culture diversity has a moderating effect, as well as testing if media has a mediating effect on project performance.

5.1 Theoretical contribution

With regards to the first aim, our findings indicate that all four concepts construing social processes (Ali et al., 2018), as well as the phenomenon itself; knowledge sharing (Adenfelt, 2009; Gasik, 2011), transfer knowledge effectiveness (Ali et al., 2018; Bjorvatn, 2019), trust and familiarity (Adenfelt & Lagerström, 2006a, 2006b; Akgün et al., 2005) act as significant drivers of project performance.

First, our study contributes to the existing theories which state a positive relationship between knowledge sharing and project performance. It extends the previous work of Adenfelt (2006a, 2006b), highlighting the importance of knowledge sharing in an international team, as a driver of success. Furthermore, Adenfelt (2009) investigated knowledge sharing's effect on project performance, where the findings established a positive correlation between knowledge sharing and international project performance. Gasik (2011) underlines Adenfelt's findings, where the scholar find knowledge sharing as one of the most important success factors regarding project performance. This study supports the empirical findings from Adenfelt and Lagerström (2006a, 2006b), Adenfelt (2009) and Gasik (2011), providing additional evidence that knowledge sharing positively affected international project performance. In addition, the knowledge creation theory is further confirmed in this study, since knowledge sharing has a positive influence on project performance (Adenfelt & Lagerström, 2006a; Navimipour & Charband, 2016).

Second, our study explores new patterns, mainly concerned with transfer knowledge effectiveness' positive impact on project performance. The importance and challenges of transfer knowledge effectiveness has been empirically proven in regard to the international

team (Ali et al., 2018; Bjorvatn, 2019). This is a field that has received little attention, whereas this study provides additional empirical evidence regarding the transfer knowledge effectiveness in relation to international project performance. Our findings establish a positive relationship between transfer knowledge effectiveness and project performance, expanding the existing theories of Ali et al. (2018) and Bjorvatn (2019) regarding the importance of transfer knowledge effectiveness in international teams.

Furthermore, our study supports the empirical findings in regards to the positive relationship between familiarity and project performance (Akgün et al., 2005), as well as confirms the preliminary findings, stating a high level of familiarity is positively correlated to project performance. Luhmann (2000) posit that familiarity has a positive impact on social processes, which is empirically proven in our study. Further, we expand the empirical ground by including familiarity in an international context. Our findings state a positive relationship between familiarity and international performance.

By extension, our study confirms the theoretical proposition that trust have a positive influence on project performance (Adenfelt & Lagerström, 2006a, 2006b; Akgün et al., 2005). Previous studies signifies the importance of trust as one of the most important success factor for project performance (Akgün et al., 2005). Following, reduced knowledge sharing, due to lack of interpersonal trust, is empirically established to have a negative effect on project performance (Adenfelt & Lagerström, 2006b). Our study broadens the scope by including trust in an international context, which are consistent with assertions in the literature. This study empirically states a positive correlation between trust and international project performance.

Lastly, for the first aim of our study, we explored social processes' effect on international project performance. Social processes have been empirically proven to have a significant positive effect on project performance in both a domestic context (Ali et al., 2018). We further expand this theory by considering contextually relevant social processes' effect on international projects, as endorsed by Adenfelt (2009). Based on this study's accumulated social processes, we were able to establish a significant relationship between social processes and international project performance.

For the second aim of our study the moderators and mediator were assessed. Contrary to our expectations, neither of the hypotheses proved to be significant.

Based on our empirical findings, we are not able to support the theory stating that complexity negatively affect (moderates) international project performance (Akgün et al., 2005; Bjorvatn & Wald, 2018). A possible explanation for why complexity did not have a moderating effect could be that the majority of participants considered their project to be complex, but the majority of participants also considered their project to be successful (see Appendix F). Hence, a moderating effect would not be expected based on our empirical evidence. In addition, the essence of a team is to compose highly skilled team members, in order to solve complex and unique tasks. Thus, the team members are capable of handling complex business environments, potentially reducing the possibility of a moderating effect.

Based on our empirical findings, we are not able to support the theory that national-culture diversity negatively affect (moderates) international project performance (Bjorvatn & Wald, 2019). Moreover, a possible explanation as to why national-culture diversity has insignificant moderating effect could be a result of the well-functioning social processes. Even though the majority of participants experienced a high level of national-culture diversity, the high rating of project success implies a well-functioning project management (see Appendix F). If the management are able to create a common ground for the relevant participants, there should be little reason for a culturally diverse team to perform significantly weaker than other low-culture-diverse teams.

Repeatedly, based on our empirical findings we were unable to establish a significant mediating relationship between social processes and media and between media and project performance, as explored based on the inspirations retrieved from the choice of media and media richness (Bjorvatn & Wald, 2019; Mesly, 2015). A direct-effect only is established, which means there are potentially omitted mediators, explaining the relationship between social processes and project performance. A possible explanation as to why this is the case could be the overall media richness based on the four media provided for the participants (see Appendix G). The majority of participants had a relatively high frequency of all different media, making a mediating effect less likely. Another explanation could be our focus in the questions. If we were to focus on the communication between geographically dispersed team members only, this could yield a different level of media richness, again potentially resulting in a mediating relationship.

5.2 Practical implications

The findings of this study lead to several implications for managing international projects successfully. First, knowledge sharing along with transfer knowledge effectiveness are two important elements in project knowledge management, and are essential phenomena in regards to the task execution (Johansson et al., 2013; Pereira & Goncalves, 2017). Second, trust and familiarity have proven to be notable drivers of project performance, and should be considered by the management team, as well as within the team (Adenfelt & Lagerström, 2006a, 2006b; Akgün et al., 2005). These two social phenomena can be acknowledged as the fundament of knowledge sharing, which again imply their importance for international project performance (Luhmann, 2000). In sum, project knowledge management, through social processes, should receive a considerable amount of attention in order to carry out a successful international project.

As mentioned, this study did not find any affect from complexity, national-culture diversity or media choice in regard to the international project performance. The business environment is dynamic and complex, and the management should be flexible in order to meet environmental issues (Akgün et al., 2005; BJORVATN & WALD, 2019). These are concepts that still need to be continuously considered by the management, and with the help from well-functioning social processes one might be able to overcome these challenges, and still perform well.

5.3 Limitations and future research

Every study has its limitations, and so does this one. First, we based our questionnaire on previously established surveys, which limited our impact on the relevancy of the specific questions within the constructs. By formulating new and more precise questions, the possibility of attaining acceptable indicators would increase. Following, one would be able to distribute an equal amount of questions within the selected variables, which would decrease the likelihood of bias. Second, we were limited by the small sample size. A larger sample size would provide us with more data, making the results more precise and consistent. Third, we are unable to consider the degree of cultural differences, since we do not establish the nationality of the respondents.

For future research we would recommend conducting a comparative study. It would be interesting to compare both the weak performing projects versus the high performing projects,

as well as highly complex/diverse project versus the not complex/diverse projects. We believe the social processes would affect the comparatives differently and would potentially yield further information about the relationship between social processes and project performance. Since we were unable to find a mediating relationship between social processes and project performance, we would recommend testing with a more elaborate media construct, project knowledge management, duration of project etc.

To get a more comprehensive understanding of the phenomena, a qualitative approach could be applied. This would additionally provide reasoning behind the driving forces of project performance and supplement our findings.

6. Conclusion

The aim of this theses was to find answers to the following research question: The effects of social processes on project performance in international projects.

Our results show a significant positive relationship between social processes and project performance in international projects. The exogenous variables composing social processes provided significant positive relationship with project performance. Based on our findings, trust and knowledge sharing are the strongest social processes affecting project performance, while familiarity is the weakest driver. Hence, our results support Akgün et al. (2005) and Adenfelt and Lagerström (2006a, 2006b) theory that trust have a positive effect on project performance, which in our case is the highest driver. In addition, Adenfelt and Lagerström (2006a, 2006b), Adenfelts (2009) and Gasik (2011) argument of the importance of knowledge sharing, is conjointly supported by our findings. Further, we confirm the influence transfer knowledge effectiveness has on project performance, as proposed by Bjorvatn (2019) and Ali et al. (2018). Akgün et al. (2005), Adenfelt and Lagerstöm (2006a, 2006b) and Luhmann's (2000) theory regarding familiarity's effect on project performance, is also confirmed, as the least performing driver.

Complexity and national-culture diversity were included in the conceptual model, inspired by Bjorvatn and Wald (2018, 2019) research, to see if they moderated the relationship between social processes and project performance. Even though the measures provided good internal results, we were unable to establish any moderating effect from either of the variables. As discussed, our reasoning behind the insignificant results are based on the fact that the majority of projects are complex and diverse, but also successful. In addition, the project was highly successful, while also complex, which means the team were capable of handling a high level of complexity. Another reasoning for us not establishing a moderating effect could be the well-functioning social processes, which considers both the national culture-diversity issues and complexity issues.

Furthermore, media richness theory was included to see if we found any mediating effect between social processes and project performance, inspired by Bjorvatn and Wald (2019). Based on our empirical evidence, we were unable to detect any mediating effect between social processes, media and project performance, only direct effect.

Lastly, we checked the robustness of our findings by including the duration of project, size of the project and the number of nationalities and languages in the project as control variables. None of the control variables achieved significant values, which indicates that the theories provided by the mentioned scholars regarding knowledge sharing (Adenfelt, 2009; Adenfelt & Lagerström, 2006a, 2006b; Gasik, 2011), transfer knowledge effectiveness (Ali et al., 2018; Bjorvatn, 2019), familiarity and trust (Adenfelt & Lagerström, 2006a, 2006b; Akgün et al., 2005) can be further accepted by our findings.

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Appendices

Appendix A

Questions Included in the Survey

Please respond based on your last international project.

General Information

1. Have you worked in an international project?
2. Which industry do you work in?
 - a. Constructing, Consulting, Telecommunication, Oil and gas, other. x
3. Number of people who worked in the project.
 - a. Exact number (we will later categorize the answers)
4. Number of different internationalities
 - a. Exact number (directly measured)
5. Duration of the projects
 - a. Exact number

Knowledge Sharing (Ali et al., 2018)

(1= strongly disagree to 5= strongly agree)

1. We have systems and venues for people to share knowledge and learn from each other in the company.
2. We share information and knowledge with our superiors.
3. We share information and knowledge with our subordinates.
4. We often share ideas with other people of similar interest, even if they are based in different departments.
5. There is a great deal of face-to-face communications in our company.
6. We use information technology to facilitate communications effectively when face-to-face communications are not convenient.
7. We use information technology to access a wide range of external information and knowledge on competitors and market changes, etc.
8. Through sharing information and knowledge, we often come up with new ideas that can be used to improve our business.

9. We have networks of sharing knowledge with other organizations on a regular basis.
10. People are encouraged to access and use information and knowledge saved in our company systems.

Transfer Knowledge Effectiveness (Bjorvatn, 2019)

(1= strongly disagree to 5= strongly agree)

1. The quality of the knowledge transferred within the project was satisfactory.
2. The process of knowledge transfer between project participants was satisfactory.
3. Project participants thought that the knowledge transfer between themselves was successful. The results of the knowledge transfer activities within the project were very good.
4. The results of the knowledge transfer activities in the project satisfied project participants.

Familiarity (Akgün et al., 2005)

(1= strongly disagree to 5= strongly agree)

1. I knew the other members of my team (on average), at the time our project team was formed.
2. I had interaction with the other members of my team (on average), at the time our project team was formed.

Trust (Akgün et al., 2005)

(1= strongly disagree to 5= strongly agree)

1. Most of my teammates approach his/her job with professionalism and dedication.
2. I see no reason to doubt my teammates' competence and preparation for the job.
3. I can rely on other teammates not to make my job more difficult by careless work.
4. Most of my teammates can be relied upon to do as they will to do.
5. I can talk freely to my team about difficulties I am having at work and know that my team will want to listen.
6. If I share my problems with my team, I know she/he would respond constructively and caringly.
7. I would have to say that we (my team) have made considerable emotional investments in our working relationship

Project complexity (Bjorvatn & Wald, 2019)

(1= strongly disagree to 5= strongly agree)

1. The project had a high degree of task novelty.
2. The project had a high degree of complexity concerning content.
3. To me, the project had a high degree of complexity concerning interdisciplinary participants.
4. The project was characterized by high risk and uncertainty.

National-culture diversity (Bjorvatn & Wald, 2019)

(1= strongly disagree to 5= strongly agree)

1. Project participants varied widely in their cultural values.
2. Project participants held totally different cultural perceptions and beliefs.
3. Project participants varied widely in their cultural communication norms and behaviors.
4. It took time to get used to the ways and manners of the other project participants.

Media (Bjorvatn & Wald, 2019)

(1= never, 5= very frequently)

1. In your impression, how frequently were the following knowledge transfer mechanisms used in the project?
 - a. Face-to-face meetings
 - b. Video conferencing
 - c. Telephone
 - d. E-mail

Project performance (Popaitoon & Siengthai, 2014)

(1= strongly disagree to 5= strongly agree)

1. Our project is meeting operational specifications.
2. Our project is meeting technical specifications.
3. Our project is meeting time goals.
4. Our project is meeting budget goals.
5. Our project is fulfilling client needs.
6. Our client is satisfied with the projects performance.

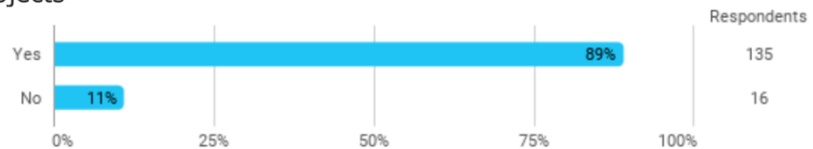
Appendix B

Number of responses

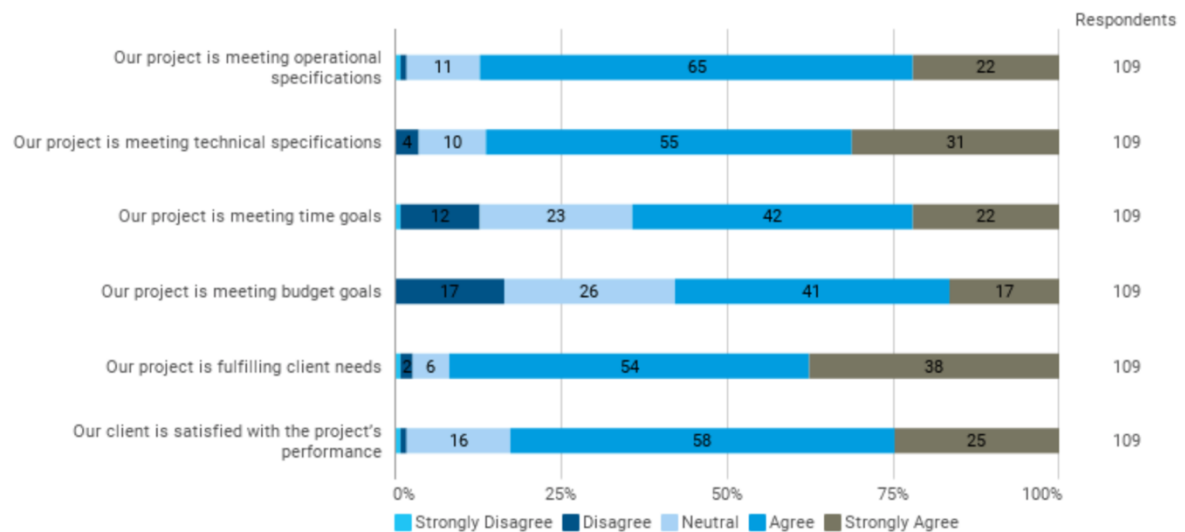
First picture shows number of responses on the first question in the survey, while the second picture shows number of responses on the last questions. The third picture is included to show the overall responses.

1.

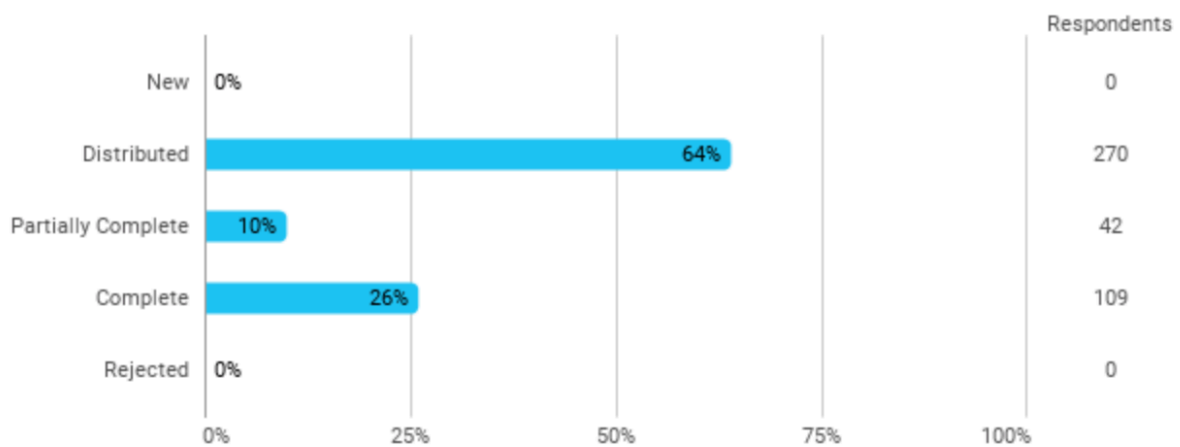
Worked in international projects



2.



3.



Appendix C

Harman's single factor test SPSS

Total Variance Explained

Factor	Total	Initial Eigenvalues		Extraction Sums of Squared Loadings		
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.282	27.799	27.799	4.581	24.108	24.108
2	2.277	11.986	39.785			
3	1.754	9.230	49.015			
4	1.538	8.093	57.108			
5	1.225	6.446	63.554			
6	1.034	5.445	68.999			
7	.833	4.383	73.382			
8	.740	3.893	77.274			
9	.621	3.267	80.541			
10	.586	3.085	83.626			
11	.532	2.802	86.428			
12	.506	2.661	89.089			
13	.421	2.218	91.307			
14	.379	1.995	93.302			
15	.349	1.839	95.141			
16	.307	1.615	96.756			
17	.250	1.314	98.070			
18	.224	1.180	99.249			
19	.143	.751	100.000			

Extraction Method: Principal Axis Factoring.

Appendix D
Skewness and Kurtosis

	<i>Skewness</i>	<i>Kurtosis</i>
KS		
5	-0,86	0,90
12	-0,74	1,33
14	-0,84	0,84
Sum	-0,81	1,02
TKS		
15	-1,58	3,25
16	-0,95	1,13
17	-0,85	1,22
18	-0,70	0,49
Sum	-1,02	1,52
F		
19	0,18	-1,04
20	-0,56	-0,55
Sum	-0,19	-0,80
T		
22	-0,49	1,05
23	-0,81	1,05
24	-0,41	0,26
25	-0,73	0,91
26	-0,71	1,05
Sum	-0,63	0,86
PP		
40	-1,07	3,94
42	-0,47	-0,46
43	-0,21	-0,89
44	-1,38	3,99
45	-0,92	2,64
Sum	-0,81	1,84
Total	-0,69	0,89

Appendix E

VIF Higher order constructs

Collinearity Statistics (VIF)

Outer VIF Values		Inner VIF	
			VIF
s_18			2.506
s_18			3.176
s_19			1.323
s_19			1.520
s_20			1.323
s_20			1.479
s_22			2.024
s_22			2.267
s_23			1.935
s_23			2.061
s_24			1.640
s_24			1.770
s_25			1.989
s_25			2.172
s_26			1.944
s_26			2.701
s_40			1.726
s_42			1.626
s_43			1.587
s_44			1.851
s_45			1.829
s_5			1.201
s_5			1.322

Outer VIF Values		Inner VIF	
			VIF
s_12			1.268
s_12			1.631
s_14			1.208
s_14			1.560
s_15			1.771
s_15			2.057
s_16			1.894
s_16			2.141
s_17			2.082
s_17			2.308
s_18			2.506
s_18			3.176
s_19			1.323
s_19			1.520
s_20			1.323
s_20			1.479
s_22			2.024
s_22			2.267
s_23			1.935
s_23			2.061
s_24			1.640
s_24			1.770
s_25			1.989

Appendix F

Moderators – mean value

Categorical mean values	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Complexity	< 1%	12%	23%	40%	25%
National-culture diversity	4%	19%	25%	42%	10%
Project performance	1%	6%	15%	52%	26%

Appendix G

Mediator – mean values

Media	Never	Rarely	Sometimes	Frequently	Very freq.
Face-to-face	3%	17%	31%	44%	5%
Video conferencing	8%	11%	37%	26%	17%
Telephone	2%	24%	26%	35%	14%
E-mail	1%	0%	4%	35%	61%

Appendix H

Reflection note – Ingeborg Berntsen Mæland

The thesis accumulates social phenomena defined through social processes, in order to see how it affects project performance in international projects. Knowledge sharing has proven to have a positive impact on project performance, both in a domestic and an international context. A complementary phenomenon, transfer knowledge effectiveness has also recently been proven to positively correlate with project performance. Other social phenomena, trust and familiarity has also proven to positively affect project performance. Our study accumulates all of these social phenomena in order to see if it has a positive impact on international project performance. In addition, complexity has proven to have a moderating effect on project performance, which we also test for in our study. National culture diversity is also included and tested for in our study. In the present world, media is prevalent and important in socializing and communicating in international projects. Hence, we decided to include media, as communication tools, as a mediator in our conceptual model.

We collected 102 responses through SurveyXact and exported the data into SmartPLS. In order to use this statistical program, we applied partial least square structural equation modelling (PLS-SEM). SmartPLS made it possible to test and reject or confirm all our hypotheses. Our findings confirm the preliminary findings done by other scholars. Knowledge sharing, transfer knowledge effectiveness, familiarity and trust, as social processes all positively affect international project performance. Even though we intended to find a moderating relationship between complexity and project performance, as well as for national culture diversity and project performance, we were unable to provide significant numbers. The media choice did not provide significant numbers either, which means we were unable to establish a mediating relationship between media and project performance.

Internationality

Initially I made the decision to immerse in international management and have throughout the master program had an international focus and perspective. I wanted to focus on internationality due to the high rate of globalization and believe the business world are parallelly increasingly globalized. Hence, I see international trends as important and interesting. Considering my master program direction, I always intended to have an international perspective on my master thesis.

Our research question is directly connected to international trends, as it focuses on international projects. Every question answered by the respondents were based on their international experience. Which means, both the research question, and the data collection, were based on internationality. As established by other scholars, globalization is a fact, and many industries and businesses are dependent on communicating and working across country borders. Based on our findings the overall success rate of international projects is high, meaning they are well-functioning. This amplifies the importance of focusing on international forces and trends.

We sent out the survey worldwide. We hoped to receive international responses, but due to our anonymous survey, which I will come back to later, we are not quite sure where the respondents came from. This means our survey can include Norwegian responses only, only international responses – or a combination of both. This made it difficult to interpret how international the survey actually is. However, every respondent based their answers on projects including more nationalities than two, meaning the international aspect is included either way.

To increase the level of international focus, we could have collected information regarding the respondent's country of origin. With this information, we could have analysed how digitalized the specific countries were and see how the project performance were. Then we would have been able to see if there is any connection between project success and globalization. A potential thought based on our findings, is a positive correlation between the degree of globalization and project performance. If this would have been included, the thesis would achieve an additional international level.

Innovation

Our research does not directly link to innovation. As mentioned, media is included as mediator. Media choices are continuously increasing, due to more advanced and efficient technology. A potential innovative perspective on the thesis could be to explore other media options and choices. When working in an international project the media choice is important and absolutely necessary in order to communicate with fellow team members placed in other countries. Lately there has been a lot of focus on different communication tools, besides skype and mail. Zoom and Microsoft teams has emerged as valid and great candidates for communicating through the computer or telephone.

To make our thesis more focused on innovation, a qualitative approach would have been beneficial. In this way we would be able to see what kind of communication tools were used in the larger versus the lower sized international projects. In addition, we would be able to investigate what companies explored new, and more innovative options, and see how their project performance was, up against firms not exploring other innovative options. Again, if this was the case, we would have been able to include innovativeness as a variable and consider it as a potential driver of project performance.

Complexity is also an aspect one would need to consider within international projects. Even if we did not achieve significant numbers, a high degree of complexity acquires a degree of innovativeness. Based on our study, the complexity can be dealt with through well-functioning social processes. When considering communication methods, one should be innovative in order to find the best solution for the specific composed team, for the specific task – including considering the time frame.

Projects are in itself unique and complex, which means a new way of thinking is often required in order to complete the task. This means we can find innovativeness, in some sort, in any project. Hence, when looking at international projects, we indirectly consider innovation, even though it is quite vague. If we take the research international project as an example, they need to consider new ways of thinking, in order to establish new theories. The oil and gas company are facing falling oil prices and might need to consider new innovative ideas to store and handle their produce. Again, we were unable to consider this seeing the timing of our thesis, but the point still stands. Most companies using international projects needs to continuously consider economic and environmental changes and challenges, and a degree of innovativeness is often favourable.

Responsibility

Once we established using a questionnaire, we decided it to be anonymous. In this manner, we did not have any confidentiality issues, and the respondents could answer knowing we had no potential to track the answers back to them. This was done by the help of SurveyXact, a survey program supported by the University of Agder. Even though we delivered the survey through personal emails, we had no way of knowing who the respondents of the survey were. Some of the respondents sent a confirmation of their attendance, while others wrote a detailed answer through mail. This was particularly interesting for us to read, contributing with more qualitative

information. To continue our stand on anonymity, none of this information is included in the thesis, nor in our evaluation of the subject.

Further, international projects itself is a potential way to meet environmental challenges. Regarding climate change and carbon footprints, working worldwide by the use of media provides a step forward in meeting such challenges. Instead of having to fly or use other carbon-heavy transportations, people are able to meet online, still providing successful results.

Conclusion

To summarize, our thesis includes every abovementioned aspect. Our thesis has an overall international aspect, including international trends. International projects are in a sense innovative, and our study was done anonymously – considering the responsibility of our respondents. Still, there are several ways we could have included more aspects to increase the level of internationality and innovativeness.

Appendix I

Reflection note - Victoria Pleym Sandnes

Our thesis is a contribution to the field of projects. International projects are used more frequently, and at the same time increases the need to understand the dynamic within the projects. The thesis focus on how social processes defined as; knowledge sharing, transfer knowledge effectiveness, familiarity and trust, affect project performance. International projects face additional challenges due to geographical distance, cultural differences and the increased complexity when considering the international aspect. Media is selected as a mediator, as well as complexity and national-culture diversity as moderators. They are added to the structural model to further investigate the impact on the relationship between social processes and project performance.

With the use of the statistical method PLS-SEM, our structural model is tested with the use of high and low order constructs, LOC being the four constructs defining social processes, and HOC being social processes affection on project performance. Our findings detect significant relationships between social processes and project performance, thereby supporting our hypothesis that social processes have a positive effect on project performance. However, we do not manage to confirm our hypotheses that complexity and national-culture diversity have a negative effect on the relationship between social processes and project performance. The same goes for the hypothesis assuming media works as a mediator between social processes and project performance, where no significant relationship was established.

International trends

Changes in the market forces companies to be able to adopt to the dynamic market. Companies are therefore in frequently need to develop new working methods in order to keep track with their competitors. Projects are a known method used to take advantage of existing knowledge and is often used to cope with the changing market. As the market expands, companies experience faded borders across countries. Companies are establishing offices in multiple countries, expanding their reach to unique resources, labor and customers, as a result of globalization. Different forms of media as communication tools opens up for the ability to increase the use of international projects, and at the same time the need for more knowledge. The use of projects is an increasing trend in the international perspective because of its ability to work across borders and collect unique knowledge. Our thesis contributes to get a better

understanding on how international projects work and what is important to pay attention to in order to succeed.

Although international projects give companies opportunities to gather expertise from different countries, there are also challenges when using projects across countries. Cultural differences and norms need to be carefully considered and respected in order for an international project to succeed. Therefore, along with the increasing use of international projects follows the increasing need of understanding each other in order to achieve good results working together in projects. Our thesis enlightens these challenges and try to find a connection on the affect cultural differences have on international projects. Based on Bjorvatns theory we try to identify a negative effect between culture differences and project performance in international projects. Even though our thesis did not manage to support the theory, it is clear that the international perspective changes the dynamic in projects and needs to be taken into considerations in order for the project to perform well.

The increasing use of international projects has, as mentioned influenced us when choosing the topic of our thesis. Since this is a topic that is still not fully investigated, the need for expanded knowledge is necessary in order to understand the dynamic in international projects, and then be able to use it as an advantage. Our thesis contributes to the field of projects, trying to understand the impact in an international context. The international use of projects opens up for opportunities using resources in new innovative ways, it is therefore important to continue doing research in this field in order to get a better understanding of the impact international projects have.

Innovation

The questions used in our survey was collected from previous research papers within the field of knowledge and projects. Because this is a field in constant change, the use of projects has therefore changed a lot since the questions was made, making them less relevant to newer projects as well as in the context of internationality. An improvement in this thesis can be to develop new questions more directed to the challenges and methods that are present in international projects today. New developed questions adjusted for newer more complex projects could give better results closer to reality.

Another improvement one could do is regarding the collection of data. The survey was sent out by email to different employees within different companies. All respondents answered anonymously, which made it impossible to check which countries that is represented in the data. In order to be able to generalize in a large scale it would be necessary to analyze the data collected, making sure multiple countries and multiple different organizations are represented in the data. Without this perspective one can only make assumptions that our findings can represent the normality. When looking at the data, another improvement would be to collect data in a larger scale, again making sure the findings represent the normality.

The suggested improvements would require longer time collecting data as well as more information from the participants. It would potentially be more successful approaching different companies by phone, to enter into an agreement with the manager that employees should spend some of their time answering the survey. Multiple answers within the same companies can strengthen the validity and reliability of the findings.

Responsibility

As mentioned, does the thesis look into how cultural differences can make an impact on project performance through social processes. Different cultures and norms can challenge projects due to the fact that some approaches can be seen unethical for some cultures and ethical for others. It is therefore important that the participants in international projects are aware of the cultural differences and try to adapt to them, making sure all participants agree in the methods that is used to complete the project.

International projects gather knowledge and expertise from different countries. By the use of different medias as communication tools can the projects be a part of reducing unnecessary traveling, taking environmental responsibility. This is not something we investigate in our thesis but can be seen as an advantage of using international projects.

Conclusion

To summarize, our thesis is both strongly affected by innovation and internationality due to the changing market and increased use of international projects. A more globalized market with faded borders will increase the cultural differences, making it important to understand and respect each other to be able to work together. It is further necessary to keep doing research in

this field due to the fact that the use of projects will continue to change and needs to be understood to be able to gain advantages from the use.