Saloni Sharma
Stian Pallin

Structural Impact on Relational Coordination and Organizational Learning: A Study of Norwegian Organizations

Master's thesis

NTNU
Norwegian University of
Science and Technology

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Abstract

Purpose: This paper aims to examine the impact of organizational structure (centralization, formalization, and specialization) on relational coordination, considering the contingent role of interdependence in this relationship. The study further examines the effect of relational coordination on organizational learning in addition to exploring the mediation effect of relational coordination in the relationship between organizational structure and organizational learning.

Design/Methodology/Approach: The study used a cross-sectional survey design and collected data from 80 public and private sector organizations in Norway. After cleaning the data, we adopted a structural equation modeling approach to test the hypotheses. We analyzed data using the partial least squares structural equation modeling technique in Smart-PLS.

Findings: The findings revealed a positive relationship between formalization and relational coordination, and a negative relationship between centralization and relational coordination, which together suggest the relevance of a hybrid structure. Moreover, we found a positive relationship between relational coordination and organizational learning and the mediation effect of relational coordination was also supported. We did not find support for the hypothesized effect of specialization and the moderating role of interdependence.

Originality/Value: The study fills an important gap in the literature by addressing how organizational structure provides a context to nurture relational coordination and how it promotes organizational learning.

Practical Implications: The findings provide important managerial implications to combine formalization and decentralization in the design of an organizational structure to create a favorable internal context for relational coordination and organizational learning to flourish.

Keywords: Organizational Structure, Relational Coordination, Organizational Learning

Sammendrag

Formål: Denne oppgaven tar sikte på å undersøke virkningen av organisasjonsstruktur (sentralisering, formalisering og spesialisering) på relasjonell koordinering, med tanke på den betingede rollen av gjensidig avhengighet i dette forholdet. Studien undersøker videre effekten av relasjonell koordinering på organisasjonslæring i tillegg til å utforske meklingseffekten av relasjonell koordinering i forholdet mellom organisasjonsstruktur og organisasjonslæring.

Design/Metodikk/Tilnærming: Studien benyttet en tverrsnittsundersøkelse og samlet inn data fra 80 offentlige og private organisasjoner i Norge. Etter å ha renset dataen, brukte vi en strukturell ligningsmodelleringsmetode for å teste hypotesene. Vi analyserte data ved hjelp av den delvise minste kvadraters strukturelle ligningsmodelleringsteknikk i Smart-PLS.

Resultater: Resultatene avdekket en positiv sammenheng mellom formalisering og relasjonell koordinering, og en negativ sammenheng mellom sentralisering og relasjonell koordinering, som sammen gir grunnlag til relevansen av en hybridstruktur. Videre fant vi en positiv sammenheng mellom relasjonell koordinering og organisatorisk læring, og meklingseffekten av relasjonell koordinasjon ble også støttet. Vi fant ikke støtte for effekten av spesialisering og den modererende rollen til gjensidig avhengighet.

Originalitet/Verdi: Studien fyller et viktig hull i litteraturen ved å ta for seg hvordan organisasjonsstruktur gir mulighet til å pleie relasjonell koordinering og hvordan den fremmer organisasjonslæring.

Praktiske implikasjoner: Funnene i oppgaven gir viktige ledelsesmessige innblikk i å kombinere formalisering og desentralisering i utformingen av en organisasjonsstruktur for å skape best grunnlag for å få relasjonell koordinering og organisatorisk læring til å blomstre.

Nøkkelord: Organisasjonsstruktur, Relasjonell koordinering, Organisasjonslæring

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Acronyms

VUCA: Volatile, Uncertain, Complex, and Ambiguous

CA: Cronbach Alpha

CR: Composite Reliability

AVE: Average Variance Extracted

SEM: Structural Equation Modeling

CENT: Centralization

FORM: Formalization

SPEC: Specialization

RELCOORD: Relational Coordination

ORGLER: Organizational Learning

Chapter 1: Introduction

1.1 Background & Problem Statement

With globalization, the advancement in information and technology is frequently obtainable. It has become more important to have effective ways for organizations to generate knowledge, exploit all the data, and improve their performance. Organizations need to continuously learn to effectively perform in fast-changing and dynamic conditions. Organizational learning is the dynamic process of knowledge creation (Real, et al., 2006), enabling organizations to understand and adapt to changes in the environment (Jiménez & Valle, 2011). However, organizational learning is difficult to realize without a proper organizational structure (Algimantas & Rimantas, 2007), making organizational structure important to determine organizational learning (Fiol & Lyles, 1985).

The organizational structure reflects the formal allocation of roles and rules, schemes of relationships and communication, decision-making process, and systems (Mintzberg, 1979) that will allow the organization to achieve its goals and objectives. Traditionally, three dimensions of organizational structure – formalization, centralization, and specialization – have been identified, which in different combinations lead to a bureaucratic, hybrid or post-bureaucratic form of organizational structure (Heckscher, 1994). The organizational structure also denotes the process in which the information and knowledge are shared within an organization, which determines the efficiency of their utilization (León & Martinez, 2011). Consequently, it mainly influences the distribution and coordination of the organization's resources, the process of relationship and communication, or the social coordination between organizational members. This suggests that organizational structure tends to have an important effect on the development of relational coordination in organizations. The quality of communication and relationships within organizations has together been referred to as relational coordination (Gittell, 2002). Moreover, in the previous literature, the role of intra-organizational communication and relationships has been empathized in the nurturance of organizational learning. This implies a chain of relationships between organizational structure, relational coordination, and organizational structure being more closely related to relational coordination and distally related to organizational learning, and

relational coordination more proximally related to organizational learning. Several studies have investigated the influence of organizational structure on organizational learning (Fiol & Lyles, 1985; Marengo, 1992; Dodgson, 1993; Von Krogh, 1998). However, these effects have not been explored with the use of relational coordination. Nevertheless, studies are done where the model includes relational coordination as a mediator (Gittell, 2002; McDermott, et al., 2019), but those studies do not use relational coordination to link organizational structure and organizational learning. This seems to be a research gap in the existing literature and needs to be addressed empirically because relational coordination is the fundamental mechanism to achieve the benefits of learning in organizations through the design of an appropriate organizational structure.

A study on organizational structure, relational coordination, and organizational learning are of particular interest in the post-covid times. In almost all countries, including Norway, the transformation of the work-culture/system in organizations, industries, and various other sectors was observed after the outbreak of the Covid-19. The on-site work of the businesses was transformed to general electronic platforms mediated by tools like Zoom and Teams as a substitution for direct coordination under conditions of co-presence for the coordination of work (Barrero, et al., 2021). The implications in the changes were caused mainly by the physical distance becoming the utmost priority, and we believe that the increment of digital work may shrink the use of teamwork or create smaller teams and increase the use of management by individual objectives. This intrigued us to find which structural arrangement will be the preferred way of organizing, and how it contributes to quality communication and relationships to foster organizational learning.

1.2 Purpose of the Study

The purpose of this study is to examine the impact of organizational structure (formalization, centralization, specialization) on relational coordination and how it in turn affects organizational learning. The study further aims to examine if interdependence between organizational units strengthens/weakens the influence of formalization, centralization, and specialization on relational coordination. Though not part of our formal theoretical model, the study will elicit responses of the survey participants about the challenges associated with post covid situation on organizing and achieving relational coordination. In addition to examining the direct effects, our purpose is to

explore the indirect effect of structure on organizational learning via relational coordination as a mediating mechanism.

1.3 Research Questions

The following research questions (RQ) are formulated on the background of the purpose of this study:

RQ 1: How does organizational structure (formalization, centralization, and specialization) affect relational coordination and organizational learning?

RQ 2: Whether and how does relational coordination act as a mediating mechanism between organizational structure and organizational learning?

RQ 3: How does interdependence play a contingent role in the structural impact on relational coordination?

1.4 Significance of the Study

1.4.1 Theoretical and Practical Significance

The study fills an important gap in the literature by addressing how organizational structure provides a context to nurture relational coordination and how in return, promotes organizational learning. These relationships have a strong theoretical rationale and have also been tested in bits and pieces empirically but have never been tested in a single model together. In this study, we bring these constructs together in a single model and empirically tested the proposed relationships by first providing a theoretical basis for the direct effects, mediation, and moderating effect.

In addition to our general theoretical contribution, the study will offer interesting insights on organizing, coordinating, and learning in Norwegian organizations.

Our study will also have important practical implications for organizations. There is an inconsistency in the literature about which structural arrangement (a post-bureaucratic or hybrid) will optimally benefit the organizations. Because of this, confusion has specifically mounted

among managers in the post covid situation about putting an appropriate structure in place to achieve effective coordination and be able to learn in the face of changing conditions. Our study is expected to provide some good advice to managers on these issues.

1.5 Definitions of Terms

a) *Organizational Structure:* A system that outlines the way particular activities are directed to achieve the objectives of an organization is referred to as an organizational structure. Mintzberg (1979) defines it as the sum of how an organization divides its labor into distinct tasks and then achieves coordination among them.

b) *Formalization:* The written rules, regulations, procedures, job descriptions, or policies typically practiced and are excepted to exercise within an organization (Mintzberg, 1979).

c) *Specialization:* It refers to breaking down tasks, and creating or assigning separate jobs to the worker specialized in that task (Pugh, et al., 1963).

d) *Centralization:* It refers to the distribution of power in an organization (Andrews & Kacmar, 2001).

e) *Bureaucratic:* It is referred to as a systematic and standardized structure (Ahmady, et al., 2016) that is hierarchical or rigid which focuses on centralized power and is effective to obtain the organizational goals (Weber, 1947).

f) *Post-bureaucratic:* It is referred to the decisions that are based on consensus and dialogue, rather than authority. Heckscher (1994) defines it as a horizontal structure with decentralized power which facilitates employee empowerment.

g) *Interdependence:* In this research, it refers to task interdependence, where an individual's work relies on others to complete the task and vice versa.

h) Relational coordination: It is described as "a mutually reinforcing process of interaction between relationships and communication carried out for the purpose of task integration" (Gittell, 2002).

i) Organizational Learning: It is defined as "the dynamic process of knowledge creation generated at the core of the organization via its individuals and teams, directed at the generation and development of the distinctive competencies that enable the organization to improve its performance and results" (Real, et al., 2006).

1.6 An Overview of the Study

This study is divided into five chapters. The first chapter provides the background of the study, including the problem statement, and provides the research questions with the significance of the study. The second chapter is divided into two major categories where the first section illustrates the theoretical background of the dependent and independent variables (organizational structures, relational coordination, organizational learning) that are presented in the model. The next category offers a detailed study on the conceptual model and the hypothesis development. Here, it indicates the relationship between the independent (organizational structure), mediator (relational coordination), moderator (interdependence), and the dependent variable (organizational learning) which presents a basis for the hypothesis development of the study. Chapter three explains the methods and data collection techniques conducted for the study. The next chapter, i.e., four, is just about the results and analysis of the quantitative research paper. The final chapter, five, delivers a detailed explanation of the findings based on the results and offers some limitations. Moreover, it also includes the theoretical and practical implications of the study, offers recommendations for future research, and ends with the conclusion.

Chapter 2: Theoretical background & Hypotheses development

This chapter will provide a theoretical background for this study. The chapter starts with the concept of organizational structure, including demonstrating the four different forms of the organizational structure. The forms of the organizations that results from the dimensions are also explained thoroughly. Secondly, the theory of relational coordination explains how the dimensions reinforce each other and, most importantly, the significance of effective coordination in an organization. The following section discusses how an organization generates knowledge and learning. Moreover, the final section includes the conceptual model of the study and the hypotheses development which illustrates the relationship between the variables.

2.1 Conceptualizing Organizational Structure

The organizational structure describes how the organization is built and shows how the actors relate to each other to carry out the organization's tasks. In an organization, everyone must have a clear understanding of where the authority is and thus the ability to make different decisions within the organization (Hauglund, 2004). The structure specifies who holds the authority, where decisions are made, and communication channels to use. This information is often given graphicly in an organizational chart (Fivelsdal & Bakka, 1998; Ottih, 2008).

Organizational structure can be defined as how the organization divides the labor into tasks and then coordinates among those tasks (Mintzberg, 1979). Ottih (2008) defines it as a framework of roles, responsibilities, authority, and communication relationships designed to accomplish the tasks and objectives of an organization. Based on Mintzberg's work, the organizational structure is the allocation of tasks and responsibilities, reporting relationships, mechanisms of linking and coordinating organizational elements, and a system to ensure effective communication and integration of efforts, which can be achieved by implementing the following four dimensions to indicate the organizational structure: Formalization, Centralization, Specialization, and Interdependence (Mintzberg, 1980).

2.1.1 Formalization

Formalization is the extent to which the system of rules and regulations for decision-making in organizations is written and explicitly articulated (Oldham & Hackman, 1981). Or, as Taggart and Mays (1987) put it, it is the use of well-defined rules and regulations to govern the behavior of individuals so that actions within the organization become standardized. Formalization is the degree rules, regulations, and standards of behavior are written in written form in the organization (Price & Mueller, 1986). This includes handbooks and standard procedure manuals. In addition, the rules need to be written down and distributed to get people informed of the practices (Pandey & Scott, 2002).

With many written rules and regulations, it will result in a high degree of formalization. It might reduce innovativeness and organizational learning when constricting employees to respond in the way the procedures tell them. The formalized structure reduces the pace of decision-making and motivation (Fredrickson, 1986; Oldham & Hackman, 1981; Pierce & Delbecq, 1977; Wally & Baum, 1994). Too many rules and regulations restrict the employees from using their knowledge and experience effectively, making them feel less motivated by limiting their possibility of being relevant in the organization (Walton, 1985).

Some studies show that formalization helps employees be more efficient, thus increasing motivation and organizational commitment (Adler & Borys, 1996). Clear rules allow employees to do their jobs with confidence and engage in quality work, which raises their self-esteem (Deming, 1986). Formalization is often confused with bureaucratic red tape (Pandey & Scott, 2002). But these are two different concepts, where red tape is unnecessary formalization with irrational and irritating rules (Bozeman, et al., 1992).

2.1.2 Centralization

Centralization refers to how the power is distributed in an organization (Andrews & Kacmar, 2001). For the employees, centralization can be divided into two types. The first type is to what degree the employees can influence the future of the organization. In other words, the employee's input to the decision-making process. The second type is how much influence an employee has over their tasks and its order (Dewar, et al., 1980; Wright, et al., 1997). High autonomy over

these two types indicates a decentralized organization. Suppose when the organization relies on few decision-makers, often executives in the head office it would indicate that the organization has a high degree of centralization.

The more traditional way to look at centralization, and the focus in this study, is to what degree the organization is centralized horizontally and vertically. Vertical decentralization informs about to what extent the decisions are delegated down the chain while, horizontal decentralization refers to how the authority flows outside these lines (Mintzberg, 1980). There is a flat hierarchy with a low degree of centralization of power in the ideal post-bureaucratic structure. The employees can influence the decision-making beyond the formal job descriptions. This, in turn, enables the organization to utilize all the employees in decision-king, thus strengthening the decisions made (Heckscher, 1994).

Hierarchy manages the interdependencies between the different subunits that are not easily solved through direct interaction (Thompson, 1967). It also helps to balance incentives within the organization with the organization's interests as a whole (Williamson, 1985). Another benefit of the hierarchy is to allow specialists to concentrate on problem-solving of the more unusual issues, while others do the routine issues (Garicano, 2000). Research by Porter & Siegel (2006) suggests that a decentralized, flat structure provides employees with greater satisfaction and a higher degree of self-actualization.

2.1.3 Interdependence

Interdependence refers to when an individual can optimize its action by input from another. There can be interdependencies between individuals or units to gain deeper insights into the problem and improve the output (Clement & Puranam, 2018). An organization with a high degree of interdependence will create the need for high-quality communication to perform optimally. Interdependence derives from a holistic understanding of what part of the organization contributes to the overall accomplishment of the organization's strategy (Heckscher, 1994). This way, mutual respect will grow between units within the organization.

The organizational theory (Thompson, 1967) suggests that interdependencies can be classified into pooled, sequential, and reciprocal. In some cases, interdependencies are choice variables,

which implies that the tasks that naturally include reciprocal interdependencies can be modified into sequential. Thompson (1967) assumes that organizational units are all goal interdependent because each unit contributes to the organization entirely. However, the technology used in production affects behavioral interdependence. Task interdependence is related to the procedures used to coordinate work. When the tasks are complicated and uncertain, Lawrence and Lorsh (1967) and Galbraith (1973) argue that task and environmental uncertainty increase coordination. While (Daft & Lengel, 1984) point at how more communication will reduce the uncertainty, thus create a better foundation for the development of relational coordination. With a low degree of uncertainty, the standard rules and procedures work well enough to complete their tasks. However, with more uncertainty, communication becomes more frequent, and coordination systems become more prominent (Lawrence & Lorsch, 1967).

Interdependence will also create equivocality that needs a richer form of communication to overcome (Daft & Lengel, 1984). Thus, that the quality of communication is an essential factor to handle the harmful effects of high interdependence.

2.1.4 Specialization

The role of specialization refers to narrowing down the tasks assigned to a particular function (Pugh, et al., 1963). Specialization reduces organizational interdependence by separating tasks and limits jurisdiction (Weber, 1958). Specialists are effective at their jobs but reduce organizational adaptability. The bureaucracy theory says that specialization is necessary to achieve maximum efficiency because of repetition and focus (Weber, 1958; Smith, 1991). If we look at the division of labor since civilization started, work specialization made humans more efficient. It generated higher quality products at a lower cost with specialized professions such as farmers, smiths, and bakers. Highly complicated activities, such as the moon landing, require elaborate division of labor, with many specialists doing specific tasks, where knowledge is built continuously during the work process. But no one can in these instances be sure exactly what needs to be done (Mintzberg, 1979).

Highly specialized jobs are less motivating, satisfying, and conductive to achieve desired outcomes (Ambrose & Kulik, 1999; Likert, 1961; McGregor, 1960) because it means less

autonomy and feedback (Hackman & Oldham, 1980). Individuals working within the same specialization share the same experience by doing the same tasks and potentially create stronger relational ties through shared goals and more respect for each other's work. But might result in weaker connections with people working in different areas of specialization (Gittell, et al., 2008) and increased fragmentation in the organization (Gouldner, 1954; Merton, 1940; Selznick, 1949).

To show that fragmentation of roles will impact how people perceive and solve the tasks given to them. Pichert and Anderson (1977) created a text with different aspects of a house. The participants were assigned a role either as a homeowner or a burglar. The same task of recalling all aspects of the house was given to both roles. However, the persons assigned the role as the burglar was more interested in the valuables, and the homeowner role focused more on the state of the house, such as a damaged ceiling. We can transfer this narrow focus to other functions within an organization where highly specialized personnel might filter out important information. Thus strong relationships are more suitable for highly specialized knowledge (Ancona & Caldwell, 1992).

2.1.5 Forms of Organizational Structure

Different combinations of the four dimensions mentioned will lead to three different organizational structural forms: Bureaucratic structure, Post-bureaucratic structure, or Hybrid structure. The bureaucratic structure has a high degree of formalization, centralization, and specialized tasks (Heckscher, 1994). Specialists tend to be more effective at their jobs. Hence, bureaucratic organizations believe that the organization will benefit from dividing the tasks and specializing to a high degree. We will describe the advantages and limitations of the different structures further in this chapter.

Digitalization enables the innovation process more than ever before as knowledge and platforms are easily accessible. However, as technology accelerates away, people require some time to adapt to the sudden changes promptly. The situation is often characterized as challenging as VUCA (Volatile, Uncertain, Complex, and Ambiguous) world (Broadbelt, 2020). The organizational environment gets increasingly dynamic and volatile for organizations with technological advancements (Castells, 2000). Digitizing coordination will include automation of the workflow

(Fischer & Senft, 2016). And thus, will give benefits in the form of reduction in time and effort. Multiple workers can access the data simultaneously, increasing transparency (Ochoa, et al., 2011). All these choices create a dynamic environment where the organization needs a more flexible structure to accommodate the changes.

A) Bureaucratic Structure

The ideal bureaucratic form is highly structured. In its foundation, a bureaucratic structure makes the people responsible only for their job, without looking at the task or organization holistically. The tasks are defined and formalized without much flexibility. Thereby the top managers need to decide what and who is best suitable to do the job. Hence, the employees will not adapt in the most effective way to achieve the organization's strategies and end goals when met with uncertainty (Heckscher, 1994).

Bureaucracy is an effective way to achieve rationality, precision, and predictability in the organization and continues to be relevant. Weber (1947) described bureaucracy as a highly rational structure based on legal domination, effective for organizations to achieve their goals. Moreover, in a stable and predictable environment, the bureaucratic structure will be a good fit for an organization (Helleriegel & Slocum, 1973). Still, it is criticized for its inability to successfully adapt to changes in the environment because of the high degree of centralization and formalization. Therefore, Weber's model has been an advantageous model for the industrial era with slow environmental changes (Bolin & Härenstam, 2008).

B) Post-bureaucratic Structure

Decentralization, low formalization, low specialization are indicators for the post-bureaucratic structure. The social structure in post-bureaucratic organizations is seen as more natural and organic, with webs of relationships among individuals, in contrast to the bureaucratic structure, where the social network relies on standardization and an artificial hierarchical role system that forces people into one way of interaction (Maravelias, 2003). The relationships in the post-bureaucratic structure consist of shared norms, values, and meanings (Bartlett & Ghoshal, 1997;

Volberda, 1998). And the workers will not feel restrained by the rules, enabling them to take the initiative and act spontaneously by a shared sense of belonging (Adler, 2001).

Organizations need the ability to change and adapt in rapidly changing environments and implement the proper organizational structure to achieve that adaptability. In contrast to the bureaucratic structure, the organic nature of the post-bureaucratic structure enables the organizations to be more flexible and give the ability to anticipate the need to adapt (Jamali, et al., 2006). Lack of formalization will increase the demand for coordination in organizations where unclear roles create confusion about who is supposed to do the routine tasks (Mintzberg, 1979). Some criticize the post-bureaucratic view not to facilitate the organizations to seek stability and predictability and thereby reap the efficiency benefits of standardization and reduce transaction costs (Leana & Barry, 2000).

C) Hybrid Structure

O'Reilly and Tushman (2004) argue that organizations need to include both perspectives of stable and unstable environments in a hybrid structure to exploit existing competencies while exploring and exploiting new opportunities. Organization structures are designed with the environment in which the organization operates in mind (Lawrence & Lorsch, 1967). Firms that operate in stable environments develop bureaucratic systems with hierarchal relations with well-defined job descriptions and roles. However, firms operating in unpredictable environments create a more organic or post-bureaucratic structure with few formalized tasks and a flat hierarchal structure (Aldrich, 1999; Sine, et al., 2006; Tushman & A., 2002). Therefore, in this structure, when the employees from the various groups combine, it provides the members with an opportunity to learn and develop skills that the organization can later utilize.

2.2 Relational Coordination

The first theorist to have proposed the relational theory of coordination was Mary Parker Follett (Gittell, 2010). She has presented her argument on coordination as the most effective, continuous process, and a primary function of an organization. Consistent with her reasoning, Thompson (1967) in his seminal work on organization later argued that effective coordination is a process of

"mutual adjustments" and exists when tasks among participants are reciprocally interdependent, once outcomes from one task feedback create new information for participants performing related tasks. Nevertheless, Thompson argued that coordination mostly occurs through coordination mechanisms like routines, scheduling, pre-planning, supervision, and standardization only because the mutual adjustment is prohibitively costly (Gittell, 2010). Moreover, he conversed that coordinating mechanisms are effective only in a low level of task interdependence and uncertainty due to their limited information processing capacity.

Since then, the nature of work has changed and has been characterized by higher levels of task interdependence and uncertainty, time constraints, expanding the importance of mutual adjustment beyond what Thompson originally foresaw, and the study of coordination as a relational process (Gittell, 2010). In recent studies, organizational scholars have responded to coordination as a fundamental relational process (Claggett & Karahanna, 2018). They all have developed relational approaches to coordination that built on Follett's concept of coordination, mutual adjustment, including (Weick & Roberts, 1994) concept of sense-making, expertise coordination (Samer & Sproull, 2000), coordination as energy-in-conversation (Quinn & Dutton, 2005), and concept of collaborative community (Heckscher, 1994). Therefore, Follett's proposition on relational coordination has sought to extend, and now in the context of a larger body of work, it offers a unique way to conceptualize the relational dynamics of coordination (Gittell, 2010).

Relational coordination is defined as "a mutually reinforcing process of interaction between relationships and communication carried out for task integration" (Gittell, 2002). The theory of relational coordination differs from the other theories by proposing three specific nature of the relationship and four dimensions of communication through which effective coordination occurs (Claggett & Karahanna, 2018). The three dimensions of relationship include *shared goals* that transcend participant's functional goals, *shared knowledge* that enables participants to understand their specific task concerning the whole work process, and *mutual respect* that enables participants to overcome their status barrier that prevent them from taking account of other's task (Gittell, 2011). The dimensions of communication include timely communication, accurate communication, frequent communication, and problem-solving communication. Together, these

three relational dimensions reinforce and are reinforced by four dimensions of communication and form the basis for coordinated collective action (Gittell, 2006).

To conclude, the theory of relational coordination identifies the two dimensions that are integral to the coordination of the work. They are conceptualized as ties between work roles (task-based relationship), rather than personal ties between discrete individuals who inhabit these work roles. The following sections describe the relationship and communication dimensions of relational coordination and then describe the ways these dimensions mutually reinforce each other.

2.2.1 Relationship Dimensions of Relational Coordination

As communication does not occur in a vacuum, the effective coordination between the participants is influenced by the quality of their relationships; shared goals, shared knowledge, and mutual trust, which are discussed below.

a) Shared Goals

Theorists like Richard Saavedra (1993) and Ruth Wageman (1995) reasoned shared goals as a central factor in the coordination of highly independent work. The higher level of shared goals among participants results in effective coordination for the work process they are engaged in. The bond is stronger among the participants with a set of shared goals for the work process, and they can directly come to compatible conclusions in responding to the new information and ideas (Gittell, 2011). Thus, the shared goals increase the quality of the generated ideas by the team members and improve productivity even when undertaking different tasks. However, the participants working in distinct functional areas often lack the shared goals (Gittell, 2011). James March and Herbert Simon (1958), in their classic work on organization, described the negative outcomes that are more likely to take place when the participants pursue their functional goals without reference to the superordinate goals of the work process, they are involved in.

b) Shared knowledge

Effective coordination is directly proportionate to the degree of shared knowledge regarding each other's tasks. The shared knowledge of everyone's tasks between the participants allows them to understand the participant that will be impacted by any uncertainty or given change and therefore

grounded in an understanding of who needs to know what, and with what urgency (Gittell, 2011). It allows accurate information, better coordination, and stronger ties between the participants in the whole work process. Due to the differences in training, experiences, socialization, and expertise, the sociological theory (Dougherty, 1992) demonstrates that the participants from different functional backgrounds often mentally perceive things differently. Referred as "thought worlds" as in theory, they are the major contributor of obstacles to effective communication that demoralize the effective coordination of work (Gittell, 2011). The "sense-making" theory of Karl Weicks (1994) proposes that the shared understanding of the participants in the work process can enhance effective coordination as they can connect participants from these distinct thought worlds.

c) Mutual Respect

Furthermore, effective coordination also depends upon the participants ensuring respect for each other in the same work process. Disrespect is bound to cause division in participants who have different roles in the work process (Gittell, 2011). The members of distinct occupational communities (a group of people involved in similar work and have a common shared of values and norms) often seem to have different status and prefer to maintain their status by actively cultivating disrespect for the work performed by others (Van & Barley, 1984). Because of this divisive relationship, the tendency of effective coordination deteriorates when the members of these distinct occupational communities are involved in a joint work process (Van & Barley, 1984). Hence, mutual respect enforces a strong bond by avoiding breakdown in the team and plays an integral role in effective coordination.

2.2.2 Communication Dimensions of Relational Coordination
a) Frequent Communication

The frequency of communication between the participants plays a fundamental role since it is executed for work coordination. The repeated interaction between the participants allows them to build a familiar relationship that can also be referred to as frequent communication. The network theory (Granovette, 1973) suggests that strong relations are defined primarily in terms of frequency while others claim that high-quality connections can exist independent of the frequency

of communication (Dutton & Heaphy, 2003). Thus, relational coordination encompasses the importance of frequent communication for coordinating highly interdependent work than just the frequency of communication.

b) Timely Communication

The procrastinated and delayed communication may cause blunders resulting in negative implications for organizational effectiveness (Gittell, 2011). Though the communication can be frequent, it might lack timeliness and be of poor quality. Thus, while coordinating highly independent work, timing can be critical. The research (Orlikowski & Yates, 1991) supports the argument on the importance of timely communication for effective performance, even though timely communication has not been well explored as essential to the coordination of highly independent work.

c) Accurate Communication

Accurate information plays a significant role in effective task performance (O'Reilly & Roberts, 1977). Referring to this reasoning, we can say that even if the information is received frequently and timely but is not accurate, it is more likely to cause an error or delay the work process of the participants to seek more accurate information. Accuracy can be facilitated by using the right resources and the right technology. The accuracy of the communication might have implications for trustworthiness and may affect the likelihood of knowledge-seeking (Levin & Cross, 2004).

d) Problem-solving Communication

The common cause of conflict is interdependence. Task interdependencies often result in an issue that requires joint problem solving therefore, effective coordination requires that the participants engage in problem-solving communication (Gittell, 2011). The Total Quality Management theory (Deming, 1986) demonstrates that blaming results in negative consequences for performances as it reduces the opportunities for problem-solving. However, existing theories (Stevenson & Gilly, 1993) support the importance of problem-solving communication in highly independent work.

2.2.3 How the Dimensions of Relational Coordination reinforce one another?

The theory of relational coordination argues that shared goals, shared knowledge, and mutual trust supports a high quality of communication and vice versa. The effective coordination of work is carried out through frequent, high-quality communication and relationships among participants. Scholars in the field of communication have found that the frequency and quality of communication influence the quality of relationships and vice versa. Theorist Theodor Newcomb, (1956) mentioned that frequent, high-quality communication is rewarding for those who engage in it and can develop trust and respect in their relations. He further states that this mutual influence between communication and relationships lies at the heart of relational coordination.

Shared goals increase participants' motivation to engage in high-quality communication and increase the likelihood that they will resolve to problem-solving communication rather than blaming when things go wrong (Gittell, 2006). In other words, it encourages participants to move beyond sub-goal optimization and to act concerning the complete work process. Shared knowledge also enables the participants to communicate with each other with greater accuracy. Participants who are not connected through the shared knowledge of the work process do not understand what others are doing, to anticipate the urgency of communicating information to them. Thus, it informs participants of the way their task and the team members specific tasks contribute to the overall work process, enabling them to act with regard for the overall work process. Furthermore, mutual respect increases the likelihood that participants will be receptive to communication from their team members in other units, irrespective of their relative status (Gittell, 2011).

Hence, this web of relationships reinforces and is reinforced by the frequency, problem-solving, accurate, and timely nature of communication, enabling participants to effectively coordinate the work process (Gittell, 2011). The low-quality relationships (functional goals, specialized knowledge, and disrespect) have an inverse impact on effective coordination as it hinders the participant's ability and undermines communication. Figure 1 illustrates how mutual reinforcement can occur in either positive or negative directions.
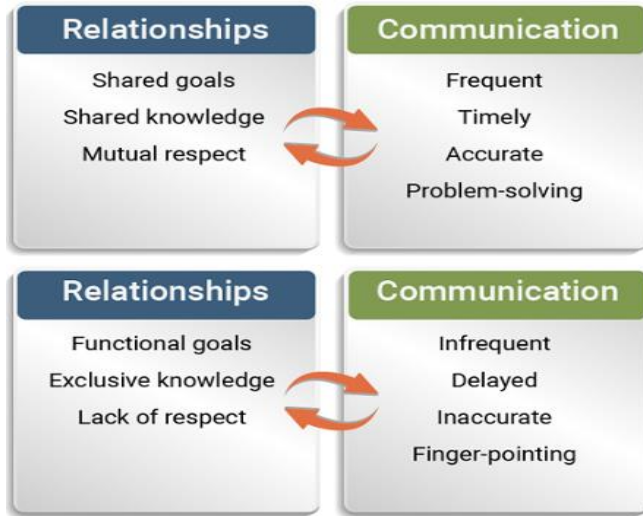
Figure 1 - **Relational Coordination as a mutually reinforcing cycle of relationships and communication.**

2.3 Organizational Learning Defined

Organizational learning is an ambiguous term and the literature on organizational learning has grown exponentially in recent years (Jiménez & Valle, 2011). Nevertheless, organizational learning enables innovation and process effectiveness which is essential for the business houses (Joshi, et al., 2010). Real (2006) defines organizational learning as "the dynamic process of knowledge creation generated at the core of the organization through its individuals and groups, directed at the generation and development of the distinctive competencies that enable the organization to improve its performance and results".

Referring to Huber (1991) organizational learning is a knowledge creation process, and it comprises of four different subprocesses. The first step is the *knowledge acquisition* that the company uses for obtaining new information and knowledge. Followed by the *knowledge distribution*; the employees of the company share information and experiences inside the firm. Third, *knowledge interpretation* where the individuals give meaning and transform information into general knowledge. Lastly, *organizational memory*; the process when an organization stores information for future usage. This process increases the knowledge created by individuals in an organized way and transforms the knowledge into part of an organization's management system

(Garcia & Maria, 2012). The process takes place through interaction within a community in which the organization creates knowledge, then expands in a constant dynamic between the tactic and the explicit (Nonaka, 1995). Therefore, organizational learning enables firms to understand and interpret the environment by helping them to adapt to the exponential and unpredictable changes in the environment (Jiménez & Valle, 2011).

The learning process ought to engage the whole organization. Organizational learning mostly takes place in the social context, and March (1991) describes it as the mutual learning of an organization and its individuals. Organizations' knowledge is embedded into their norms, rules, practices, and procedures and it accumulates such knowledge over time, through their members by learning and, simultaneously, individuals in an organization are also socialized to organizational beliefs (Marengo, 1994). Such mutual learning is considered a fundamental factor and has implications for balancing the trade-offs between exploration and exploitation in organizations (March, 1991).

Organizational learning is further classified into internal (observational) and external (experimental) learning. The knowledge created within the company through research and development and implementation of best practices is identified as internal learning whereas, the knowledge the company gains from the external environment is referred to as external learning (Fernández-Mesa, et al., 2013). Hence, organizational learning enables the development, acquisition, and transformation of new knowledge and information that enhances organizational innovation (Jiménez & Valle, 2011)). It emphasizes that, the ability to process acquired knowledge is improved when collaboration and exchange of information within the organization are encouraged. Thus, organizational learning, i.e., knowledge, can be recognized as a significant asset, which is acquired from outside and is produced from inside, stored, and exploited, for generating and developing performance levels.

2.4 Conceptual Model & Hypotheses Development

- **Conceptual Model**

The conceptual model (Fig: 2) includes the variables from the research question and the dimensions which make up these variables. The organizational structure is the independent

variable of our study which further is studied into centralization, formalization, and specialization. Relational coordination is the mediator of the model, which constitutes of quality of relationship and quality of communication.. Organizational learning is the dependent variable that is measured in our model of the study. Interdependence is the moderator which helps to show the relationship between these variables. Lastly, the control variables are listed as the demographic variables i.e., age, type, and the industry in our study. The following figure represents the conceptual model that is based on the theory presented in this chapter.
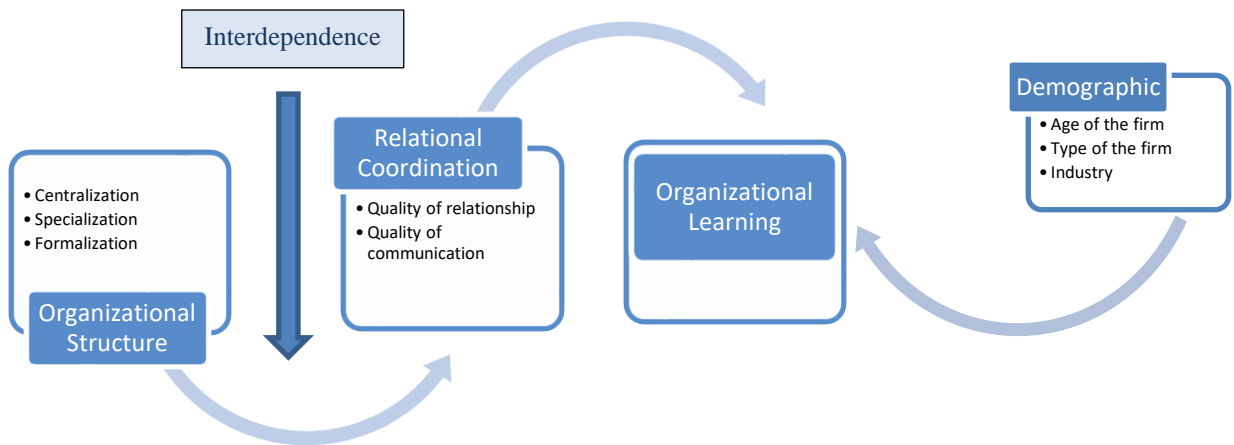
Figure 2 - Framework of the Study

- **Hypotheses Development**

The following section thoroughly demonstrates the relationship between the antecedent, mediator, moderator, and the endogenous variable of the study. Furthermore, it also highlights the theoretical background between the relationships of the dependent and independent variables, the mediator and the moderator, and illustrates the expected hypothesis from this study.

2.4.1 Organizational Structure and Relational Coordination

When looking at how relational coordination develops within an organization, we need to know how the organizational structure affects communication in the organization. The benefits of a high

degree of relational coordination by connecting employees through shared goals, shared knowledge, and mutual respect despite lack of personal ties, are influenced by the practices in the organization (Gittell, 2011). In the following sections, we will investigate how organizational structure influences relational coordination.

The bureaucratic structure is related to structured coordination, with rules and regulations to determine the information flow in the organization. On the other hand, we got the post-bureaucratic structure that relates more to unstructured coordination. The nature of the unstructured coordination mechanism is likely to give the workers points of interaction, thus giving opportunities for the development of relational coordination (Claggett & Karahanna, 2018; Gittell, 2002).

A high degree of centralization and formalization will negatively impact the relational coordination in organizations. The coordination mechanisms informal and highly centralized organizations are less appropriate for coordination than decentralization and low formality (Chen & Huang, 2007). When the procedures and rules determine what, how, and to whom the information is supposed to go through, it reduces the transaction costs by limiting the possibilities to coordinate flexibly (Grant, 1996) (Lam, 2000). Not only will centralize and formalized organizations be confined within the organization, but also when communicating with other organizations because of the control embedded in centralized systems (Chen & Huang, 2007).

In organizations with high specialization, such as patient care, the information that the involved parties need to convey is complex. Studies show it is more effective whenransmitted through strong relationships (Ancona & Caldwell, 1992; Hansen, 1999; Szulanski, 1996).

When Heckscher (1994) describes the ideal post-bureaucratic structure, the flat hierarchical nature of the post-bureaucratic structure with less formalized rules and regulations, making it easier for employees and work units to share a common goal. Instead of having a specified task in their job description, people are incentivized to work towards the company's common goals. Thereby arguing for a structure with low centralization, low formality, and low specialization will positively affect relational coordination.

H1: High degree of formalization will negatively influence relational coordination.

H2: High degree of centralization will negatively influence relational coordination.

H3: High degree of specialization will negatively influence relational coordination.

2.4.2 Influence of Relational Coordination on Organizational Learning

Although the importance of organizational routines and collaborative teamwork has been well recognized in the literature, short attention has been given to the relationship between these two factors. The present relationship examines the relationship by applying the relational coordination model to measure the quality of the teamwork so that the results can be applied to obtain efficient organizational learning.

Organizational learning itself is highly firm-specific and, the relations among different parts of the organization, as defined by its structure, play a more prominent role in driving and shaping the collective learning process (Marengo, 1992). Gittell's (2010) model of relational coordination, a coordination process that takes place through a network of relationship and communication dimensions, is proven to be a powerful driver for quality and achieving efficient outcomes in several sectors (*Referring to 2.3*).

The ability to coordinate depends on the quality of relationships based on a shared goal, shared knowledge, and mutual respect. As unique and new pieces of information and ideas get available, the stakeholders easily come to compatible solutions based on their different perspectives, which ensures that the shared goals play a critical role in the coordination of highly interdependent tasks (Gittell, 2011). The differences in the training, expertise, and socialization create obstacles to effective communication and thus can erode the effective coordination of work, which is commonly seen in the digital workspace as the participants have different knowledge backgrounds (Dougherty, 1992). Thus, shared knowledge develops a dynamic environment where everyone knows about the consequences of changes in each of their role and responsibilities (Margalina, et al., 2017). Furthermore, mutual respects generate efficient coordination as participants value their coworker contributions and consider the impact of their actions on others (Gittell, 2002). Similarly, the ability of coordination also depends upon the quality of frequent, fluent, and problem-solving communication between the employees is also important for organizational performance, which promotes organizational learning. Communication is proven to improve

relationships by the closeness developed through a consequence of repeated interaction. It thus leads to an optimization of processes with highly interdependent tasks (Gittell, 2011) and, therefore, promotes organizational learning. Together these relational and communication dimensions provide the basis for coordination in collective action to achieve greater value outcomes in the organization, where high levels of task interdependence, uncertainty, time restrictions, and tactic knowledge exist (Dougherty, 1992).

In the study of regional development and innovativeness by Lawson & Lorenz (1999) coordination in an organization is observed as an organizational learning process (collectively) which ensue an improved dynamic capability, the generation of knowledge concerning methods that can be used to improve existing competencies or to develop new ones. A high degree of differentiation of knowledge among the members of an organization increases the total amount of knowledge possessed by the organization (Marengo, 1992). However, the differentiation makes the coordination further demanding and eventually can prohibit the social exploitation of this extensive knowledge basis. In opposition, a body of organizational knowledge which is normally shared by all the members facilitates coordination but reduces the scope for decentralized experimentation, which could prove a key cause of organizational learning (Marengo, 1994). Therefore, we propose this hypothesis as:

H4: High degree of relational coordination will positively influence organizational learning.

2.4.3 Mediator Role of Relational Coordination

2.4.3.1 Organizational Structure and Organizational Learning

Organizational learning is a process of detecting and correcting errors or learning from experience (Duncan & Weiss, 1979), (Hedberg, 1981), (Levitt & March, 1988). Some researchers look at organizational learning at an individual and organizational level because of individual learning (Hedberg, 1981; Dodgson, 1993; Nicolini & Meznar, 1995). In literature, Organizational learning focuses on the continuously changing nature of organizations (Dodgson, 1993) and the processes which the organization goes through when adapting to changes in the environment to gain a

competitive advantage (Chen, 2005). This way, the organizational structure can be used to determine organizational learning in an organization (Fiol & Lyles, 1985).

Algimantas and Rimantas (2007) argue that a learning organization is impossible to realize without the proper organizational structure. As mentioned earlier in this paper, organizational structure can be defined as dividing work into tasks to get coordination (Mintzberg, 1983). Otherwise, the formal allocation of work with different roles determines the relationships and communication of the employees in a system (Zerilli, 1978). Therefore, the organizational structure determines or facilitates the organization's ability to change, adapt and learn to create or maintain a competitive advantage.

The hierarchical structure of an organization will lead to a different degree of filtering. With a highly hierarchical organization, the information will flow through a long chain of people (Ahmed, 1998), and each transfer will be filtered, resulting in distorted details along the way. That way, a centralized organizational structure inhibits organizational learning. In other words, centralized organizations are more effective in exploiting information, but decentralized organizations are better for accumulating and gaining organizational learning.

Formalization with strict rules inhibits organizational learning by restricting the communication between the members of the organization (Von Krogh, 1998), (López, et al., 2006). Rules might limit the worker's ability to adapt and find better ways to solve the tasks at hand. Other studies find that individuals will use the experience to make appropriate modifications and use new knowledge (Nonaka, 1995). Organizations with low formalization will probably learn faster but will never be as productive and use that knowledge effectively as a formalized organization (Okhuysen & Eisenhardt, 2002).

Hence, the organizational structure influences the organizations' ability to learn (Fiol & Lyles, 1985). As stated by Marengo, (1994) that the organizational structure also helps to shape the organizational learning. Therefore, the organizational structure defines the way people interact and coordinate and thereby influence organizational learning (Dodgson, 1993) and also influences how organizations acquire and integrate new knowledge into the company (León & Martinez, 2011).

2.4.3.2 Relational Coordination as a Mediator

Several studies have focused on how post-bureaucracy fosters relational coordination and how organizational structure has influenced organizational learning (Chen & Huang, 2007). But the effects of structure on organizational learning transmitted via relational coordination have been overlooked. Thus, we believe that relational coordination has the potential to enhance organizational learning, and, in this study, we present it as a mediating mechanism between organizational structure and organizational learning. Organizational structure may influence organizational learning by harnessing the forces of relational coordination.

As mentioned previously, there are several studies have investigated the influence of organizational structure on organizational learning (Fiol & Lyles, 1985; Marengo, 1992; Dodgson, 1993; Von Krogh, 1998). These study mention that the structure can determine who interact and communicate with each other, facilitating or negating synergy effects of the knowledge within the organization, thus affecting the learning inside the organization (*Referring to 2.4.3.1*). This illustrates the positive relationship between organizational structure and organizational learning but however, these effects have not been explored with relational coordination. Nevertheless, there are studies done where the model includes relational coordination as a mediator (Gittell, 2002; McDermott, et al., 2019). However, those studies do not use relational coordination to link organizational structure and organizational learning either.

In this paper, we suggest that the mediating effect of relational coordination can be explained by how organizational structure facilitates the interaction among participants (Galbraith, 1973). Therefore, is expected to improve organizational learning through their effect on relational coordination. Consequently, we will examine if relational coordination acts as a potential mediator in these relationships with the following hypotheses:

H5a: Relational coordination will mediate the relationship between formalization and organizational learning.

H5b: Relational coordination will mediate the relationship between centralization and organizational learning.

H5c: Relational coordination will mediate the relationship between specialization and organizational learning.

2.4.4 The Moderator Role of Interdependence

The definition of a team is a workgroup whose tasks are interdependent (Hackman, 1987). Interdependence in organization design studies the consequences of the division of labor and the methods to build effective organizational structures. By nature, an organization comprises of employees i.e., individual workers, teams, or business units and departments to function, and thus are bound to each other by interdependence.

Accordingly, the interdependence among the employees lies in the three different characteristics of their work that are (Thompson, 1967), task interdependence, goal interdependence, and knowledge interdependence. Thompson (1967) argues that task interdependency is a major factor while selecting coordination mechanisms; the greater the interdependency, the more horizontal coordination is expected. Likewise, the dimension of technology also refers to interdependency. The technology interdependency parallels knowledge complexity in terms of dependent knowledge because (technology) interdependency entails knowledge dependency (Willem & Buelens, 2009). Moreover, the organizational theory explains that sharing information and ideas across its units is a function of the interdependency between the units (Chen & Huang, 2007). This can be extended to knowledge sharing, i.e., a higher need for knowledge sharing between units exists when these units are interdependent. Therefore, the greater interdependency between units requires more decentralized and informal coordination to share knowledge between units.

Supervision of employees is one way of aligning their actions with the goals of the organization. But in highly uncertain or interdependent environments, supervision is argued to be ineffective (Hackman & Oldham, 1980). Smaller spans of control are related to a higher degree of relational coordination through more frequent communication, stronger shared goals, shared knowledge, and mutual respect (Gittell, 2000). Ouchi (1979) argued that participants in highly interdependent processes respond better to shared goals, and supervision is hurting in highly interdependent processes. Empirical analyses by (Beekun, 1989) and (Cohen, et al., 1996) also support this view that supervision harms interdependent processes. Studies have shown that the use of interdependent rewards by shifting away from personal rewards improves performance where the work is highly interdependent (Wageman & Baker, 1997).

2.4.4.1 Interdependnce and its efects on structural dimensions

The impact of coordination on knowledge sharing depends on the nature of the coordination mechanisms applied which is related to the other structure dimensions (centralization, formalization, and specialization). Organizations which are successful in knowledge sharing can select the best combination of coordination mechanisms, including a combination of centralized and decentralized coordination (Nonaka, et al., 2006), depending on the precise intensity of interdependency, unit differences, and knowledge complexity in the cooperative affairs between units (Willem & Buelens, 2009).

Centralization and formalization are empirically examined to be negatively related to knowledge sharing than coordination mechanisms based on decentralization and formalization (Cheng, 1983). As centralization and formalization are found in the formal hierarchical coordination and systems; they formally determine the level of information needed to be exchanged (Chen & Huang, 2007). Such coordination has minimal costs and limited possibilities, which yields a controlled environment and reduces flexibility for enhancing knowledge sharing (Grant, 1996; Lam, 2000). Moreover, the decisions on sharing the specialized knowledge are only effective if the centralized decision-makers know about the knowledge held individually (Chen & Huang, 2007), this generates an atmosphere of fear, stress, distrust, or internal competition and shrinks effective collaboration (Willem & Buelens, 2009).

The horizontal coordination or decentralized consisting of teams, mutual adjustments, and networking (less formal) are likely to create flexible coordination during task execution and a high level of integration (Willem & Buelens, 2009). Teams can be formed whenever there is a need for knowledge sharing. Thus mutual adjustments can always solve the knowledge sharing problem resulting in horizontal coordination in more communication and knowledge sharing among units. Informal coordination (informal and decentralized) can also have a major impact on knowledge sharing as it is based on trust and mutual or voluntary cooperation (Mintzberg, 1983). As followed, the informal character of informal coordination creates a high willingness for cooperation and has a positive effect on knowledge sharing.

Knowledge management literature also supports the argument of specialized knowledge on knowledge sharing (Willem & Buelens, 2009). As specialization causes the development of specific expertise uniquely held by an individual or team (Mintzberg, 1980), the organization as a

dispersed knowledge system has the organizational task to utilize this dispersed knowledge (Tsoukas, 1996). The other concepts found in organizational literature closely related to specialization are associated with the character of knowledge and the difficulty of sharing dispersed and specialized knowledge between individuals or teams. In other words, it refers to the knowledge complexity resulting from specialization (Willem & Buelens, 2009). The complexity of the technology increases in terms of low analyzability with the knowledge complexity required for this technology, thus, creating difficulties to integrate units and the requirement for complex integration mechanisms (Mintzberg, 1979). Such complex integration mechanisms are inter-unit horizontal and informal coordination for the sharing of knowledge between teams.

The level of coordination represents how the members of an organization perform under their roles in the system; the required level of coordination for organizational functioning will be greater for high interdependence organizations than for low interdependence organizations (Cheng, 1983). The system theory (Bertalanffy, 1968) discusses that the summative composition rule governs the organizations with lower interdependence, i.e., the whole is an additive or collective outcome of its parts. Here, the system outcome signifies a summation of the organization members' contributions. In contrast, high interdependence is governed by a constitutive composition rule, i.e., the whole is the super-additive or collective outcome of the parts (Bertalanffy, 1968), where it signifies a union of the members' contributors. Hence, the impact of coordination will be greater in high interdependence organizations than in organizations with low interdependence. As a result, a super additive outcome is more prominent than an additive one, allowing a higher impact of coordination in an organization (Cheng, 1983).

Interdependence is one of the structural variables that influence team performance the most (Saavedra, et al., 1993). And when interdependence is high, there are more incentives to cooperate towards a common goal. In that way, interdependence unifies individuals, teams, and even organizations (Gulati & Sytch, 2007; Gundlach & Cadotte, 1994). As mentioned earlier, a high degree of interdependence will help to improve relational coordination by creating the need for communication. To test our assumptions that interdependence as a moderator in our model, our final hypotheses are the following:

H6a: Low degree of formalization will have a stronger relationship with relational coordination when interdependence is high.

H6b: Low degree of centralization will have a stronger relationship with relational coordination when interdependence is high.

Chapter 3: Methodology

Like every other research, this research is also based on philosophical theories, approaches, and paradigms that set the framework for data collection and analysis. In this chapter, the description of the first part is related to the research philosophy chosen for the study. Additionally, the sample of the study and the design of the questionnaires are reviewed. Lastly, the chapter comprises the measurement of constructs followed by the ethical considerations while conducting the study.

3.1 Research Design and Approach

The studies in natural and social sciences are informed by research paradigms, either explicitly or implicitly, when they are intended to generate new knowledge (Song & Shen, 2019). A research paradigm can be defined as a general philosophical orientation about the world and the nature of the research that a researcher brings to a study (Creswell, 2003). The research paradigm consists of qualitative, quantitative, and mixed methods. A quantitative approach has emerged from the positivist paradigm, while a constructive paradigm leads to embracing qualitative study. The positivist paradigm places considerable emphasis on rationality, objectivity, prediction, and control (Creswell, 2003). Quantitative studies particularly benefit in studying large groups of people and generalizing from the sample being study to broader groups beyond that sample while, the qualitative approach is based on attaining deeper understandings about a specific group or sample but at the expense of generalizability (Swanson & Holton, 2009). In contrast, a mixed-method is a process of mixing quantitative and qualitative data in a single or a series of studies according to the research problem (Creswell, 2003).

Quantitative research is driven by numerical data collection that is subjected to statistical analysis. Thus, it requires control to identify and limit the problem and attend to limit the effect of outside variables that are not the focus of the studies. Furthermore, control, instrument, and statistical analyses are used to ensure that the research findings accurately reflect reality and help to generalize the findings (Creswell, 2003). Critics argue that the focus of quantitative research is concise and reductionists meaning that the whole cannot be studied rather is broken down into parts so that it can be examined unlike, qualitative study, which is broad but not reductionist

because of the intent being to give meaning to the whole (Polit & Beck, 2008). This study aims to test the hypothesis and generalize the findings after analyzing the collected data. Since the objective of this study is to test theory for broad generalizations to numerous audiences, rigorous application of the quantitative methodology is required and preferred. Therefore, this study is only limited to a quantitative study as the purpose is to test the relationship among dependent and independent variables and assess cause and effect for intervention effectiveness.

Even though the research should drive the design, sometimes, the progression of the research helps determine the most appropriate design. The two different types of research design include cross-sectional studies and longitudinal studies. The cross-sectional survey is a descriptive approach and supports providing an overview of behavior, attitudes, and things happening at one specific point in time (Levin, 2006). Although, longitudinal study like a cross-sectional one, is observational cross-sectional studies can be done more swiftly. However, in a longitudinal study, researchers conduct several observations of the same subjects over a period, sometimes lasting many years, because the data is repeatedly assembled from the same sample and might follow changes in participants over time (Levin, 2006). In contrast, cross-sectional studies take less time to conduct, and the sample is usually taken from the whole population. As a result, it allows estimating the prevalence of the outcome of interest (Levin, 2006). Therefore, this research design is exploratory, and a cross-sectional study is a well-suited design for this research. Given the time and resource constraints, we proposed the quantitative study for the master's dissertation and implemented simple probability sampling through online structured questionnaires for the data collection and analysis.

3.2 Population and Sample

The population selected for this study are the public and private organizations registered in Norway, and all are retrieved from the internet. 125 firms within various sectors were screened and selected among the others. The public organization includes only municipalities whereas, the private organizations were randomly selected as per the researcher's interest in the largest Norwegian firms. The population includes organizations from twelve different industries (for instance, maritime, manufacturing, information technology, oil, etc.) which are mainly ranked as major industries in Norway according to SSB (Statistics Central Bureau). The contact information

and the designation of the employees are all retrieved from the official websites of the organizations. For some large enterprises, the employees within the same organizations but responsible for different departments were approached to have a clear insight into the study.

It is necessary to find some way to reduce the number of participants included in the survey without biasing the findings in any way (Mathers, et al., 2009). Therefore, out of various sampling techniques, probability sampling is used as a method in achieving this. Probability (random) sampling is mainly used in a quantitative study and consists of four parts: simple random sample, systematic sample, stratified sample, and cluster sample (Mathers, et al., 2009). The study is based on simple random sampling by which was conducted by distributing the survey to all the firms in the targeted population. To provide an equal opportunity for the participants, all the organizations in the targeted population were delivered with a piece of exact information to ensure that the data obtained from the survey reflects the current situation for the entire population of interest. Thus, the chosen sampling method allows precise estimation of population characteristics and provides detailed information for addressing the research problem.

3.3 Questionnaire Design

The designed questionnaire is directed to the managerial level employees within the organization to acquire reliable and experienced responses. The questionnaire for this research begins with a short description of the study's objective, including an appreciation for their participation. Similarly, the contributors are also informed about the academic use of the data. The email addresses of the researchers are enclosed in the descriptions to make the respondents clearify if they have any questions. The questionnaire is further divided into three parts. Part one comprises questions on the demographic information of the organization. The second part of the questions measures the perception of the employees concerning the characteristics of the organization they are associated with. It further consists of four sub-parts i.e., the type of structure, the quality of relationships, the quality of communication, and organizational learning. The last part is related to the employee's experiences about the impact of the Covid-19 pandemic on organizational structure. The questionnaire contains a total of 45 questions that allow the respondents to rate on a seven-point Likert Scale, ranging from 1 (Strongly Disagree) to 7 (Strongly Agree).
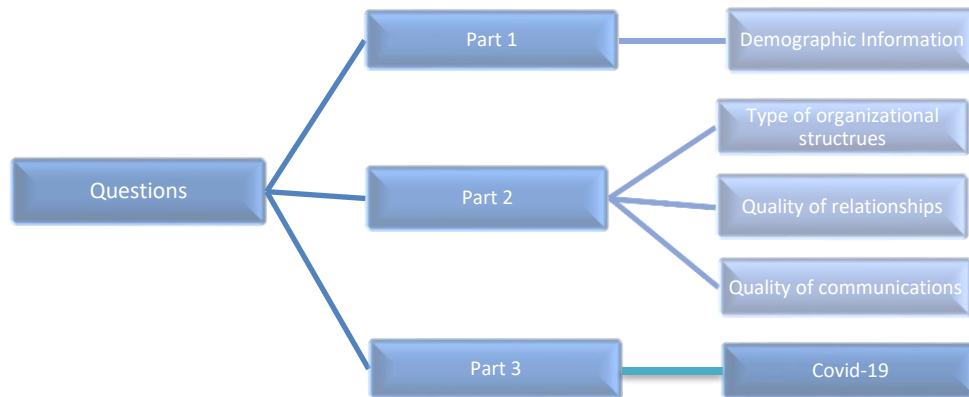
Figure 3 – The division of questionnaire

3.4 Data Collection

A survey is a type of research design, and in contrast, an interview (face-to-face and telephone) or a postal questionnaire is a method of data collection (Mathers, et al., 2009). Questionnaires are written surveys that are composed of items that address the goals of the study whereas, interviews may share some features of the questionnaire however, it is also possible to ask further explanations on the reactions of the respondents that cannot be obtained from a questionnaire. Telephone surveys are conducted through telephone from a pre-set item where the researcher has the flexibility to probe respondents' answers for elaboration (Clifford, et al., 2010).

Given the time constraints and length of the questionnaire, the online survey was preferred. Online surveys are a form of a written survey and are designed as web pages that are located on a host site (Clifford, et al., 2010). This online survey was conducted to assess the employees' attitudes and perceptions regarding the widely dispersed firms within Norway. The respondents were invited to participate in the study through e-mail. The questionnaire was constructed using Nettskjema, and the respondents were reached out through e-mail based on the targeted organization and the potential respondents within our sampling frame. Unlike other methods to reach the targeted respondents, the online surveys are fast to conduct and tabulate plus hassle-free to administer (Mathers, et al., 2009). Furthermore, the software assures the confidentiality of the participants and avoids interviewer bias and distortion, allowing the researchers to achieve a much higher response rate than would be possible with a postal or telephone survey.

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3.5 Measurement of Constructs

In this research, we have used the pre-existing scales that are employed in most empirical investigations, for the study to yield beneficial results. To identify the suitable validated scales, quite a few works of literature that would be appropriate for measuring the constructs in the present study were examined. Thus, the retrieved measuring instrument satisfies the two conditions of validity and reliability. Although the concepts of validity and reliability seem relatively similar, they signify distinct attributes of the measuring instruments. Reliability defines the consistency of a measure and validity about the accuracy of the measure (2012). It is recommended to test both the Reliability and Validity of the measuring instrument that the researchers intend to apply (Sürücü & Maşlakçı, 2020) cause its accurate to interpret the research findings when the analyses are valid. The earlier validated scales to measure constructs in the study are further explained below.

3.5.1 Demographic Information

This first section of the questionnaire comprises three sub-multiple-choice questions that measure the basic information about the organization. Together, they provide a picture of the organization in terms of age (in years) and type of the organization, including the industry they are associated with.

Age	Type	Industry
•0-3 •3-5 •5-10 •10+	•Public •Private	•Administration •Manufacturing •Shipping •Information Technology •Healthcare

Figure 4 - Demographic Information

3.5.2 Organizational Structure

Organizational Structure is operationalized with four dimensions that include, Formalization, Centralization, Specialization, and Interdependence. The six scales of formalization are adapted

from Willem & Buelens (2009) excluding one (Question no. 5) from Lambert (2007) which measures the extent to which the organizational environment is governed by rules and regulations. The scales of centralization help in the evaluation of the degree of hierarchical authority within the work unit. Here, the five scales are applied from Willem & Buelens (2009) and the other two (Question no. 5 & 6) are from Dewar, et al (1980). Likewise, to measure specialization, the three scales are obtained from Daugherty (2014) that help to analyze the expertise of the employees in their given responsibility. The four scales to measure interdependence were retrieved from Willem & Buelens (2009). All the scales are constructed in terms of organizational setting, and the response ratings are based on a seven-point Likert scale ranging from 1(Strongly Disagree) to 7(Strongly Agree). These scales measure the degree of active involvement and communication between organizational members in the development, dissemination, and implementation of organizational goals.

Formalization	Centralization	Specialization	Interdependence
• Information is mainly held in and exchanged through many reports and formal documents. • We have clear goals for our daily work performance. • In general, our work is subject to innumerable rules. • The information that is required to do my job is laid down in procedures, goals and rules. • I enjoy job flexibility, without working procedures. (RC) • We coordinate the activities with the other unit informally via personal contacts. (RC) • Cooperation with the other unit is based on personal contacts in that unit. (RC)	• Our work methods follow from the decisions of our supervisors. • Our direct supervisors decide how we should execute our tasks. • Decisions of our supervisors determine how we work. • Our bosses have large impact on our way of working. • I can take some actions without a supervisor's permission. (RC) • I am frequently asked about my inputs on the adoption of new programs at this organization. (RC) • We confer directly with our personal contacts without consulting our supervisors.	• Our firm has many "specialists" employees who perform narrowly defined sets of activities. • Most of our firm's employees are "generalists" who perform a wide variety of tasks. (RC) • In this organization, we expect our employees to be experts only in their areas of responsibility.	• The members of your unit depend on the others unit for doing their respective jobs. • The members of your unit need to rely on the other units to obtain the information and materials needed to their task. • To accomplish your team/unit objectives you need services, support, and resources from the other units. • After your unit members finish their part of the task, you need to rely on the other units to perform the next steps in the process before the total task or service is completed.

Figure 5 – Measured Scales for Organizational Structure

3.5.3 Relational Coordination

Relational Coordination is measured through two different dimensions, the quality of relationship and the quality of communication. The eight scales that are measured in the quality of relationships are developed by, Carmeli & Gittell (2008) on their study of 'High-quality relationships, psychological safety, and learning from failures in work organizations'. The scales in this study measure the shared vision, shared goals, and mutual trust within the work units. The

participants rank their relationships among the team members within the organization based on a seven-point Likert scale ranging from 1(Strongly Disagree) to 7(Strongly Agree).

Additionally, the scales on the quality of communication are retrieved from Willem & Buelens (2009) and it measures the level of exchange of information between the employees in an organization based on time, accuracy, and frequency. The responses are ranked on a seven-point Likert scale ranging from 1(Strongly Disagree) to 7(Strongly Agree).

Quality of communication; Willem & Buelens (2009)	Quality of relationships; Carmeli & Gittell (2008)
• We've frequent inter-departmental communications. • There is timely communication between our work units. • There is an accurate exchange of information between work units in this organization.	• In this org, work units share a common vision, • In this org, work units act toward common goals • Employees in this organizational units know what tasks their co-workers in other units deal with. • In this org, we share with one another the subjects we work on. • Sharing with one another in the context of work enables us to better understand the needs of each other. • Sharing with one another about our work issues enables us to better understand how our actions impact other co-workers. • There is a great deal of respect between one another at work. • When someone expresses her/his different opinion, we respect it.

Figure 6 – Measured Scales for Relational Coordination

3.5.4 Organizational Learning

The four scales used for Organizational Learning in this study were developed by, García-Morales (2012). The scales help to measures the importance of learning outcomes and the learning capabilities of an organization to achieve the team or organizational goals. The response ratings are based on a seven-point Likert scale ranging from 1(Strongly Disagree) to 7(Strongly Agree).

Organizational learning; García-Morales (2012)

- Our organization acquires and shares new and relevant information across the units that is important for organization's performance.
- The members of the organization acquire some critical capabilities and skills that enhance the organizational performance.
- Organizational improvements have been influenced fundamentally by new knowledge entering the organization.
- The organization is a learning organization.

Figure 7 – Measured Scales for Organizational Learning

3.5.5 Covid-19

As Covid has drastically changed the working environment of the organizations from physical to digital, we felt the importance of mentioning it in our study for an exploratory basis to obtain different perspectives from the employees regarding their working conditions. This additional information is excluded from the conceptual model, and the questions designed are based on the researcher's interest in the subject matter. Therefore, it is collected solely to measure the positive/negative effects of the pandemic on the organizational structure and how it can help promote organizational learning. The response ratings are based on a seven-point Likert scale ranging from 1(Strongly Disagree) to 7(Strongly Agree).

Covid-19

- I would like to continue with home office after the pandemic.
- I have more freedom in decision making while I choose to work from home.
- I feel less productive when working at home.
- I find it hard to collaborate in larger teams while working from home.
- I find it easier to develop relationships among my teammates while working in digital space.
- I prefer teamwork digitally rather than physically.
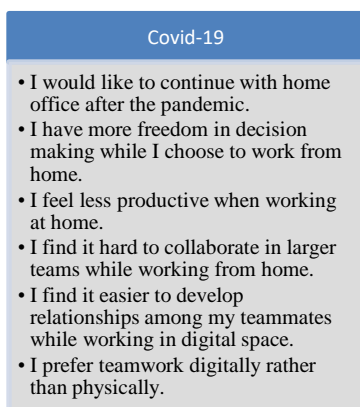
Figure 8 - Self-constructed Questions for the Covid-19 Situation

3.6 Ethical Consideration

The present study offers the anonymity of the respondents. To ensure a high degree of security and privacy, Nettskjema is used as a tool for designing and a source of data collection. The questions are designed in such a way that it does not seek out any personal information of the individual associated with the organization. Moreover, the respondents also cannot be identified from their surveys. For security reasons, we used Blind Copy Carbon (BCC) while sending out the surveys so that those addressed are invisible to the email recipients. The questionnaire also comprises a description that mentions that the supplied information will be confidential and that the participants will remain anonymous while analyzing and reporting data. Additionally, the follow-up emails also state that the researchers are not tracking the emails of the respondents.

Chapter 4. Results and Data Analysis

4.1 Introduction

This chapter will present the results of the cross-sectional e-survey. The statistical software packages like SPSS[1] (Statistical Package for the Social Sciences) and Smart-PLS[2] are considered for the confirmatory purpose of research instruments, which allows the researchers to test the cause-effect relationship of the variables simultaneously through the scales used in this research.

The data could be directly exported from nettskjema.no to SPSS for data cleaning, screening, and further analysis. Descriptive statistics were used to look for skewness, means, kurtosis, and standard deviation in SPSS. The data then got transferred into Smart-PLS for further analysis of the measurement and the structural model.

SPSS[1]: This statistical software undertakes both comparison and correlational statistical tests in the context of univariate, bivariate, and multivariate analysis for both the parametric and non-parametric statistical techniques.

Smart-PLS[2]: This software examines causal and effect relationships between several independent and dependent variables with priority to exploring the theories.

4.2 Variables

This quantitative study used an online survey based on already validated scales. The questions were adapted from previous research and translated into Norwegian to fit the target audience to make it easier to understand the questions and get more respondents. The questionnaire included 45 questions where three asked for basic company information, 36 to explore the model and the main objective of the study, and 6 to ask for how the work methods have changed during the Covid-19 pandemic.

4.2.1 Categorical Variables

The control variables include organizational measures. This study focuses on how the organizations are structured and how that affects organizational learning. This is not about how the individual respondent behaves. Therefore, we used categorical values as sectors to determine if the organization is public or private, organizational age, and industry. The reason behind using

organization age as a control variable is because age affects performance and organizational learning. The age enables the necessary time to develop and consolidate routines, reducing the efforts of organizational learning (Jiménez & Valle, 2011; Sørensen Jesper B, 2000).

4.2.2 Continuous Variables

Continuous variables like formalization, centralization, specialization, interdependence, relational coordination (quality of relationship and communication), organizational learning, and covid-19 were selected to identify the primary constructs used in the study.

4.3 Data Screening and cleaning

Before any analysis, we need to check the data for obvious errors and correct the dataset accordingly. First, we used frequency analysis to check the dataset for its maximum and minimum values to see if there were within the survey parameters and not any unexpected values. From the 80 respondents, we did not any reason to delete anyone from the sample. The missing data were replaced by means to negate the impact on the analysis. Some of the questions were asked negatively, and we reversed the scale for those questions. In the survey, it was only possible to give answers of 1 to 7 for the Likert scale answers. Therefore, a few of the variables which had the value 0 instead of "missing" were deleted to show as missing values. There were not many unanswered questions, and of the 80 respondents, everyone answered the last four questions hence they all made it through the whole questionnaire.

We used Harman's single factor method to counter the potential risk of common method variance (CMV) (Harman, 1976). This was done in SPSS by adding all the latent variables into one common factor. The results of the exploratory factor analysis resulted in a total variance of a single factor at 18.8%. For the CMV to be an issue, it needs to account for more than 50% of the total variance (Henseler, et al., 2015).

Variance inflation factor (VIF) values made in Smart-PLS give no values higher than the guideline of 5 (Menard, 1995) thus, the multicollinearity is not going to impact the analysis.

4.4 Frequency Analysis

By using frequency tables made with SPSS we can examine the different responses in the categorical variables.

Table 1 - Characteristics of Respondent Organizations - Sector, Organizational Age, and Industry

Continuous Variable	Answer	Frequency	Percent
Sector	Public	29	37 %
	Private	50	63 %
Organizational Age	0-3 years	6	8 %
	3-5 years	1	1 %
	5-10 years	4	5 %
	Older than 10 years	69	86 %
Industry	Finance	9	11 %
	Maritime	20	25 %
	IT	8	10 %
	Public Services	27	34 %
	Other	16	20 %

The table shows that 37% of the respondents work in the public sector, compared to 31,5% on average in Norway in 2016 (SSB, 2016). The organizational age shows few young organizations with little to no experience in the sample, with 86% of the respondents in the "more than 10 years" bracket. The sector classification shows a relatively equal spread between the different groups.

4.5 Descriptive Analysis

The descriptive will help to exclude variables by looking at skewness (symmetry) and kurtosis (peakedness) or, in other words, the distribution of scores (Pallant, 2016). The Likert scale ranged from 1 to 7 with a mean from 2,16 to 6,1. The high kurtosis of variable "qualcom_1" excluded it from further analysis. The kurtosis should be between -1 and 1, but values ranging from -2 to 2 can, in some cases, be accepted as well (Pallant, 2016). For cent_5 and cent_7 with somewhat

high kurtosis, the 5% trimmed mean was investigated to see if those need to be excluded as well. There was little difference between the mean and trimmed mean (0,47 for cent_5 and 0,23 for cent_7), and they will therefore be included in the further analysis. All the questions for the variables can be found in appendix 2.

Table 2 - Descriptive Statistics for Continuous Variables

Variable	Mean	Std. Deviation	Skewness	Kurtosis
form_1	4,83	1,667	-0,304	-1,127
form_2	5,35	1,459	-0,736	-0,045
form_3	5,01	1,703	-0,509	-0,877
form_4	4,15	1,718	0,038	-0,945
form_5	4,43	1,465	-0,437	-0,289
form_6	4,96	1,564	-0,760	0,348
form_7	4,37	1,469	-0,441	-0,428
cent_1	3,55	1,349	0,430	0,084
cent_2	3,31	1,346	0,363	-0,403
cent_3	3,96	1,400	0,352	-0,400
cent_4	3,86	1,348	0,193	-0,316
cent_5	5,65	1,397	-1,546	2,700
cent_6	5,31	1,346	-0,850	0,483
cent_7	5,94	1,315	-1,559	2,382
spec_1	5,43	1,551	-1,079	0,686
spec_2	4,24	1,539	-0,115	-0,697
spec_3	3,43	1,623	0,414	-0,488
inter_1	4,91	1,642	-0,621	-0,433
inter_2	4,91	1,416	-0,557	-0,217
inter_3	5,29	1,503	-0,672	-0,147
inter_4	4,31	1,851	-0,217	-0,909
qualcom_1	5,95	1,157	-1,660	4,229
qualcom_2	4,55	1,311	-0,077	-0,198
qualcom_3	4,06	1,274	0,146	-0,168
qualrel_1	5,26	1,490	-0,677	-0,423

qualrel_2	5,48	1,367	-1,025	0,660
qualrel_3	4,73	1,423	0,043	-0,973
qualrel_4	5,18	1,337	-0,333	-0,875
qualrel_5	6,00	1,086	-1,047	1,021
qualrel_6	6,10	0,908	-0,825	0,434
qualrel_7	5,91	1,112	-1,143	1,362
qualrel_8	5,81	1,032	-1,028	1,546
orglear_1	5,14	1,290	-0,480	-0,072
orglear_2	5,36	1,161	-0,553	0,011
orglear_3	5,01	1,297	-0,487	0,261
orglear_4	5,52	1,431	-1,063	0,647
covid_1	3,56	1,705	-0,055	-0,982
covid_2	3,55	1,633	0,154	-0,797
covid_3	3,69	1,893	0,327	-1,075
covid_4	4,90	1,650	-0,633	-0,520
covid_5	2,16	1,096	0,911	0,838
covid_6	2,64	1,528	0,835	0,210

4.6 Measures Validation

The validity of the scale determines if it measures what it is supposed to. In this study, we used tested scales for the questionnaire and thereby continued to test the construct validity with Smart-PLS to check factor loadings. This is where we are testing the scale against other related and unrelated constructs (Steiner & Norman, 2015). PLS is particularly useful when the sample size is small and allows less strict assumptions of the data distribution (Chin & Newsted, 1999). PLS can also deal with complex models with many constructs and relationships. (Barclay, et al., 1995; Hair, et al., 2014). The validity of the scale determines if it measures what it is supposed to.

4.6.1 Convergent Validity

Firstly, we looked at convergent validity to see in what extent two measures of the same concept correlate. From running the PLS algorithm with the initial model we got low loadings on some of

the items: form_5_rev = 0,190; form_6_rev = -0,272; form_7_rev = -0,066; cent_2 = 0,102; cent_3 = 0,042; cent_4 = 0,066; cent_7_rev = 0,151; qualrel_5 = 0,505; qualrel_6 = 0,473. These got excluded from the model. We were relatively strict on the quality of relation items because we already got enough items there to continue. In social sciences the preferred cut off value is about 0,5 (Hair, et al., 2014). Form_1 had a loading close to the cut off with 0,484. After running a bootstrapping and looking at the p-value of 0,016 indicating a significant item we decided to keep it. The p-value should be less than 0,05 to be significant.

The items mentioned in the formalization construct with low loading did not seem to be significant, with p-values from 0,307 to 0,800. The same went for centralization, with p-values ranging from 0,538 to 0,919. The two items in quality of relation with low loadings showed to be significant with p-values of 0,000 and 0,001.

4.6.2 Reliability Analysis

In this chapter, we are going to discuss more the reliability of the data. Because we used already tested scales in this study, we will not analyze to what degree the scales are free from random errors (Pallant, 2016). Although, we are going to look at the internal consistency and how the scales are measuring the underlying attributes. This will be done by analyzing the Cronbach's alpha (CA) values we got from Smart-PLS (Pallant, 2016). The CA will show values between 0 and 1. It is recommended to have a CO larger than 0,7, but when there are fewer than ten items on the scale, the Cronbach's alpha values can be low, which is also what our analysis showed. To investigate further, we also look at the Composite reliability (CR) to assess the reliability of the constructs. The CR values are all higher than 0,7, and we can continue with the analysis with the dataset.

Table 3 - The Primary Constructs, Items, Loading Values, Cronbach Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE)

Construct	Indicator	Loading	CA	CR	AVE
Interdependence	inter_1	0,700	0,845	0,889	0,669
	inter_2	0,845			
	inter_3	0,898			

	inter_4	0,840			
Formalization	form_1	0,484	0,763	0,801	0,513
	form_2	0,883			
	form_3	0,634			
	form_4	0,786			
Centralization	cent_1	0,604	0,592	0,757	0,522
	cent_5_rev	0,632			
	cent_6_rev	0,915			
Specialization	spec_1	0,867	0,601	0,786	0,554
	spec_2_rev	0,701			
	spec_3	0,636			
Quality of communication	qualcom_1	0,877	0,666	0,817	0,600
	qualcom_2	0,563			
	qualcom_3	0,807			
Quality of relation	qualrel_1	0,788	0,867	0,900	0,600
	qualrel_2	0,718			
	qualrel_3	0,774			
	qualrel_4	0,824			
	qualrel_7	0,767			
	qualrel_8	0,775			
Relational Coordination	qualcom_1	0,677	0,871	0,899	0,501
	qualcom_2	0,505			
	qualcom_3	0,673			
	qualrel_1	0,876			
	qualrel_2	0,767			
	qualrel_3	0,727			
	qualrel_4	0,768			
	qualrel_7	0,641			
	qualrel_8	0,677			
Organizational learning	orglear_1	0,835	0,879	0,916	0,733
	orglear_2	0,898			
	orglear_3	0,824			
	orglear_4	0,866			

4.6.3 Discriminant Validity

To determine if the constructs are different, we use Average Variance Extracted (AVE) to indicate the convergence for the variances of the constructs. The AVE should be greater than 0,5 to assume discriminant validity for the constructs (Hair, et al., 2014). Despite having the formalization construct close to the cut-off value of 0,5. We did not get any constructs with values lower than 0,5. To confirm the findings, we look at the square root of AVE in the table below to ensure the discriminant validity. The square root of AVE, highlighted in bold text, should be higher than the other construct variables. The missing values for RELCOORD under QCOM and QREL are because the two constructs use the same variables. Thus, this analysis makes no sense to discuss further.

Table 4 - Discriminant Validity Coefficients

	CENT	FORM	INTER	ORGLER	QCOM	QREL	RELCOORD	SPEC
CENT	**0,723**							
FORM	-0,239	**0,716**						
INTER	-0,095	0,435	**0,818**					
ORGLER	-0,555	0,468	0,156	**0,856**				
QCOM	-0,262	0,491	0,394	0,525	**0,775**			
QREL	-0,445	0,495	0,130	0,739	0,625	**0,775**		
RELCOORD	-0,435	0,541	0,232	0,743			**0,708**	
SPEC	-0,225	0,535	0,352	0,342	0,463	0,37	0,439	**0,744**

4.7 Structural Model Estimation

Bootstrap analysis in Smart-PLS was used to find the path coefficients and to what degree they are significant. To test our hypothesis, we need to look at the relationships between different constructs or latent variables. We will, in this chapter, use Structural Equation Modeling (SEM) to simultaneously explore relationships between different constructs and variables while accounting for measurement error.

4.7.1 Endogenous Variables

R squared indicates to what extent the structural variables explain the variance. The goodness of the model is determined by the strength of the path and the combined predictiveness of its exogenous constructs (Chin, 1998). An R squared value of 1 indicates a perfect fit and would be suspicious and undoubtedly wrong for this type of study.

Table 5 - R-Square Values

Endogenous Variables	R Square	R Square Adjusted
Organizational Learning	0,551	0,546
Realational Coordination	0,421	0,645

The organizational structure variables explain 55,1 percent of the variance in organizational learning ($R^2 = 0,551$), 42,1 percent of relational coordination ($R^2 = 0,421$).
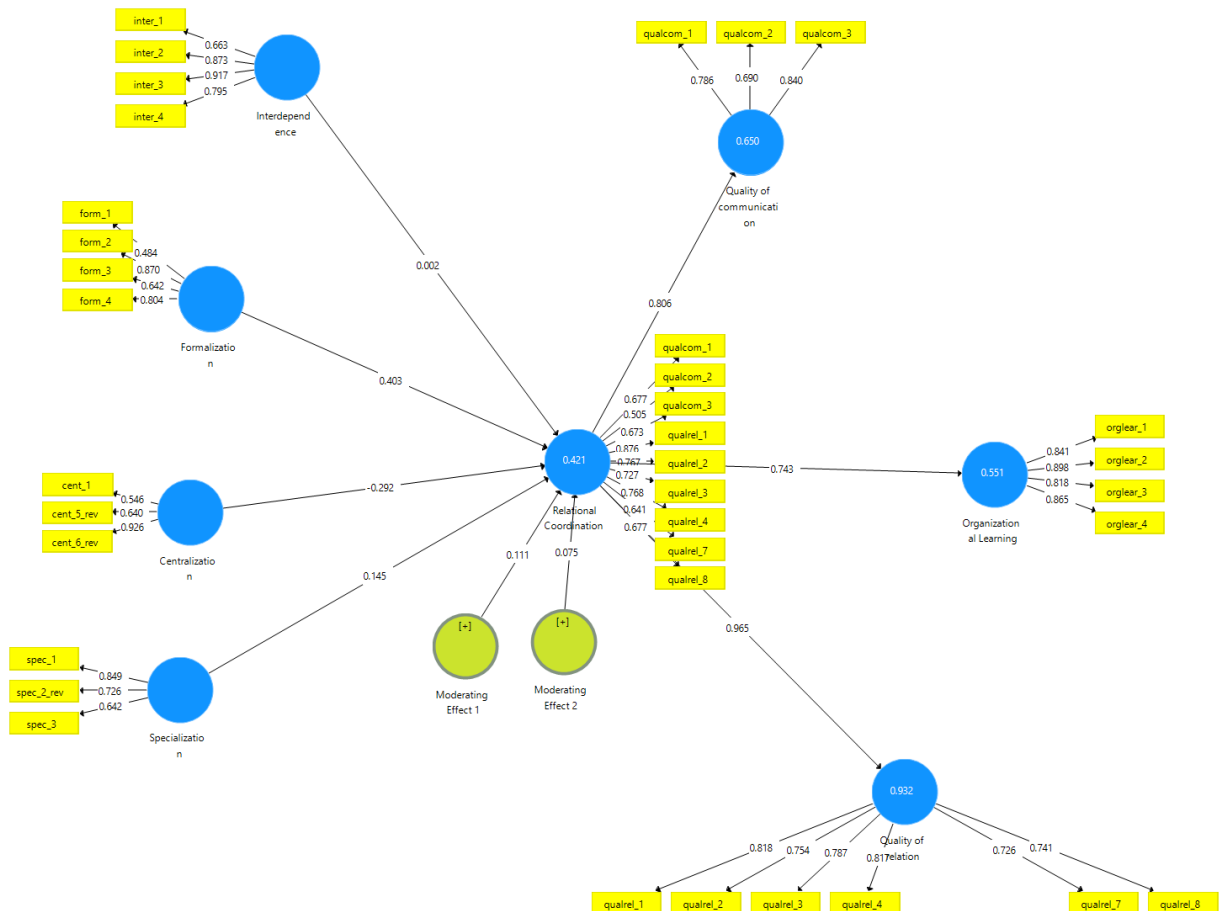
4.7.2 Direct Effects - Path Assessment

Table 6 - Direct Effects - Path Coefficients, Effect Size, Variance, and Confidence Intervals

Relationship	β-values	t-values	Effect Size	p-values	VIF	5,00 %	95,00 %
Centralization	-0,292	2,984	0,129	0,003	1,136	-0,440	-0,121
Formalization	0,403	4,106	0,147	0,000	1,648	0,246	0,570
Interdependence	0,002	0,015	0,001	0,988	1,344	-0,141	0,208
Moderating Effect 1 -> Relational Coordination	0,111	0,838	0,003	0,402	1,191	-0,086	0,331
Moderating Effect 2 -> Relational Coordination	0,075	0,718	0,004	0,473	1,101	-0,112	0,229
Relation Coordination on Organizational Learning	0,743	11,929		0,000		0,630	0,834
Specialization	0,145	1,234	0,012	0,217	1,562	-0,045	0,331

When looking at the direct effects we can clearly see a significant relation between formalization and relational coordination ($\beta = 0,403$, $p = 0,000$). Specialization shows no impact on relational coordination. Relation coordination show a significant impact on organizational learning ($\beta = 0,743$, $p = 0,000$). There was no significant impact on the dependent variables among the categorical variables, and we could not use any of them as a control variable. By running the model with or without the independent variables and no significant change in the beta-values. Among the categorical variables, we did not get any significant impact on age, industry, or sector.

4.7.3 Indirect Effects - Path Assessment

In addition to the direct effects of the relationships in the model, we also explore the indirect relationships of formalization and specialization on relational coordination. In other words, the mediation effect of relational coordination. Our results show a significant indirect effect for formalization and centralization. A significant indirect effect with a t-value > 1,96 and p < 0,05 indicate a mediation effect (Zhao, et al., 2010). And this supports the hypothesis for relational coordination as a mediator between formalization and organizational learning, together with

centralization and organizational learning. However, it does not give sufficient evidence to accept a mediating effect of relational coordination for specialization on organizational learning.

Table 7 - Indirect Effects - t-values, Confidence Intervals, and p-values

Association	β-values	t-values	p-values	5.0%	95.0%
FORM -> RELCOORD -> ORGLER	0,299	3,582	0,000	0,170	0,441
CENT -> RELCOORD -> ORGLER	-0,217	2,775	0,006	-0,341	-0,087
SPEC -> RELCOORD -> ORGLER	0,108	1,225	0,221	-0,035	0,245

To confirm the mediating effect of relational coordination, we conducted a Sobel test. The beta values and standard deviation results were extracted from Smart-PLS. By using an online calculator (Soper, 2021), we then got the Sobel test statistic and two-tailed probability as presented in table 8.

Table 8 - Sobel test – Beta values and Standard deviation, Sobel Test Statistic and Two-tailed probability.

	Formalization	Centralization	Specialization	
Beta values				
Direct no mediating effect	0,144	-0,256	0,023	
Direct with mediating effect	0,357	-0,436	0,050	
Structure -> Relcoord	0,403	-0,292	0,145	
Relcord -> Org lear				0,743
Standard deviation				
Structure -> Relcoord	0,163	0,134	0,112	
Relcord -> Org lear				0,087
Sobel test statistic	**2,37487561**	**-2,11145466**	**1,28001862**	
Two-tailed probability	**0,01755486**	**0,03473325**	**0,20053859**	

The Sobel test statistic should have an absolute value greater than 1,96. Centralization and formalization achieve this, but not specialization. The two-tailed probability should show values less than 0,5 to be significant. As with the Sobel test, formalization and centralization show significant values but not specialization. If we compare the beta-values, we see an increase when including the mediator for all formalization, centralization, and specialization. In conclusion, this analysis shows that relational coordination has a mediating effect on organizational learning for formalization and centralization.

4.7.4   Moderation Effect – Path Assessment

For the hypothesis testing of the moderating effect of interdependence on organizational structure concerning relational coordination, the results of PLS bootstrapping show no significant connection and low beta values ($\beta < 0,120$, $p > 0,05$). Specialization was excluded from this analysis when it did not establish substantial relationships within the model. These findings are confirmed by the change from negative to positive value between the confidence intervals.

Table 9 - Moderating Effect - Path Coefficients, Effect Size, and Variance

Moderating Variable	β-values	t-values	p-values	VIF	5,00 %	95,00 %
Centralization	0,111	0,838	0,402	1,000	-0,086	0,331
Formalization	0,075	0,718	0,473	1,000	-0,112	0,229

4.8 Testing Research Hypotheses

Based on the structural estimation in Smart-PLS, we will present the results together with the hypotheses.

4.8.1 Hypothesis 1

The first hypothesis about how formalization influence relational coordination the path effects show that there is positive relationship between formalization and relational coordination. A p-value of 0,000 indicates that there is a positive relationship between a high degree of formalization and relational coordination. Thus, the hypothesis is significant in the reverse direction.

4.8.2 Hypothesis 2

The second hypothesis about how centralization influence relational coordination show a negative relation between high degree of formalization and relational coordination. P-value of 0,003 indicates sufficient evidence to accept the hypothesis.

4.8.3 Hypothesis 3

The third hypothesis is how specialization influences relational coordination. The beta-value show a weak relation, but the p-value of 0,217 indicates that the findings are not significant. Therefore, Hypothesis 3 is not accepted.

4.8.4 Hypothesis 4

The fourth hypothesis state a positive relationship between relational coordination and organizational learning. The path assessment shows a high strong relationship between relational coordination and organizational learning. And with a p-value of 0,000, provide enough evidence to accept the hypothesis.

4.8.5 Hypothesis 5

5a is testing the mediating effect of relational coordination between formalization and organizational learning. Table 7 of indirect effects indicate t-value greater than 1,96 and a p-value of 0,000 < 0,05. Secondly, the confidence interval does not straddle zero in between, thus confirming the mediation effect. This evidence is enough to support hypothesis 4a.

5b is about the mediating effect of relational coordination between centralization and organizational learning. Both the t-value and the p-value indicate a significant effect (Table 7). Together with the confidence intervals, we can also accept this hypothesis.

5c is testing whether there is a mediating effect of relational coordination between specialization and organizational learning. Contrary to the previous parts of hypothesis 5, table 7 indicates no significant relationship. We cannot accept this hypothesis with a low beta value, a t-value less than 1,96, p-value > 0,05 and a shift from negative to positive numbers in the confidence intervals.

4.8.6 Hypothesis 6

Hypothesis 6a is about whether interdependence will affect the relationship between formalization and relational coordination. Hypothesis 6b is about whether interdependence will affect the relationship between centralization and relational coordination.

Both these moderating variables show weak loadings and are deemed as insignificant with p-values > 0,4. We were thereby rejecting the hypotheses.

Table 10 - Summary Hypothesis Testing

Hypotheses	Result
H1: High degree of formalization will negatively influence relational coordination.	Not Supported *The relationship was significant but in the reverse direction.*
H2: High degree of centralization will negatively influence relational coordination.	Accepted
H3: High degree of specialization will negatively influence relational coordination.	Not Supported
H4: High degree of relational coordination will positively influence organizational learning.	Accepted
H5a: Relational coordination will mediate the relationship between formalization and organizational learning.	Accepted
H5b: Relational coordination will mediate the relationship between centralization and organizational learning.	Accepted
H5c: Relational coordination will mediate the relationship between specialization and organizational learning.	Not Supported
H6a: Low degree of formalization will have a stronger relationship with relational coordination when interdependence is high.	Not Supported
H6b: Low degree of centralization will have a stronger relationship with relational coordination when interdependence is high.	Not Supported

4.9 Additional Analysis

After testing the research questions and hypothesis and finding that relational coordination might have a mediating effect, as the questionnaire enabled us to divide relational coordination into two dimensions, we wanted to explore the different dimensions of relational coordination further. And to address our curiosity, we will do a simple analysis explaining how people responded to a post-pandemic situation when working from home.

4.9.1 Dimensions of Relational Coordination

The following analysis is done by slightly changing the model in SmartPLS to look for a relationship between the different structural variables and the two dimensions of relational coordination. The structural variables are centralization, formalization, and specialization. The relational dimensions are quality of communication and quality of relationship, as shown in table 11. In this part, we got significant values for the relationship between formalization (p-value = 0,016 > 0,05) and specialization (p-value = 0,045 > 0,05) on quality of communication. Looking at the confidence intervals confirms the significance level. Though the beta values show a weak link, we can see an indication of a relationship here.

Table 11 - Analysis of Quality of Communication and Quality of Relationship

Relationship	β-values	t-values	Effect Size	p-values	VIF	5,00 %	95,00 %	
CENT -> QUALCOM	-0,314	0,979	0,127	0,328	1,350	-0,457	0,420	
FORM -> QUALCOM	0,283	2,417	0,089	0,016	1,579	0,125	0,500	Significant
SPEC -> QUALCOM	0,213	2,012	0,053	0,045	1,491	0,036	0,380	Significant
CENT -> QUALREL	-0,284	1,006	0,088	0,315	1,350	-0,538	0,302	
FORM -> QUALREL	0,323	2,643	0,097	0,008	1,579	0,171	0,539	Significant
SPEC -> QUALREL	0,076	0,628	0,006	0,530	1,491	-0,103	0,296	
QUALCOM -> ORGLEAR	0,183	2,643	0,049	0,104	1,628	-0,001	0,373	
QUALREL -> ORGLEAR	0,634	1,628	0,587	0,000	1,628	0,475	0,779	Significant

For the quality of relationship, we only found significant levels for formalization. With a p-value of 0,008. Centralization and specialization show no significant impact on the quality of relationship. Lastly, we also analyzed how both relational coordination dimensions relate to organizational learning. Where quality of communication had not a significant effect with a p-value of 0,104. But the quality of relationships had a relatively high loading with a beta-value of 0,634 and a significant relationship (p-value = 0,000 > 0,05).

4.9.2 The impact of Covid-19 in an organization

To investigate the effects of the post-pandemic situation and the respondent's opinions, we present the answer based on the seven-point Likert Scale, ranging from 1 (Strongly Disagree) to 7 (Strongly Agree) represented by the value in table 12. All the questions can be found in appendix 1 (Norwegian) and 2 (English).

Table 12 - Answers from Covid-19 Questions.

Value	covid_1	covid_2	covid_3	covid_4	covid_5	covid_6
1	18 %	12 %	11 %	3 %	33 %	29 %
2	13 %	19 %	24 %	10 %	34 %	26 %
3	14 %	18 %	15 %	9 %	23 %	15 %
4	25 %	21 %	19 %	13 %	9 %	20 %
5	18 %	19 %	8 %	23 %	1 %	5 %
6	11 %	8 %	14 %	28 %	1 %	3 %
7	3 %	4 %	10 %	16 %	0 %	3 %

From table 12 we immediately see that the answers for question 5 and 6 are top-heavy, meaning a generally low opinion the questions. This effect is also presented in the diagram below (figure 9). This makes it easier to see the trend for covid_5 (I find it easier to develop relationships among my teammates while working in digital space) and covid_6 (I prefer teamwork digitally rather than physically), but also a trend towards agree for covid_4 (I find it hard to collaborate in larger teams while working from home).
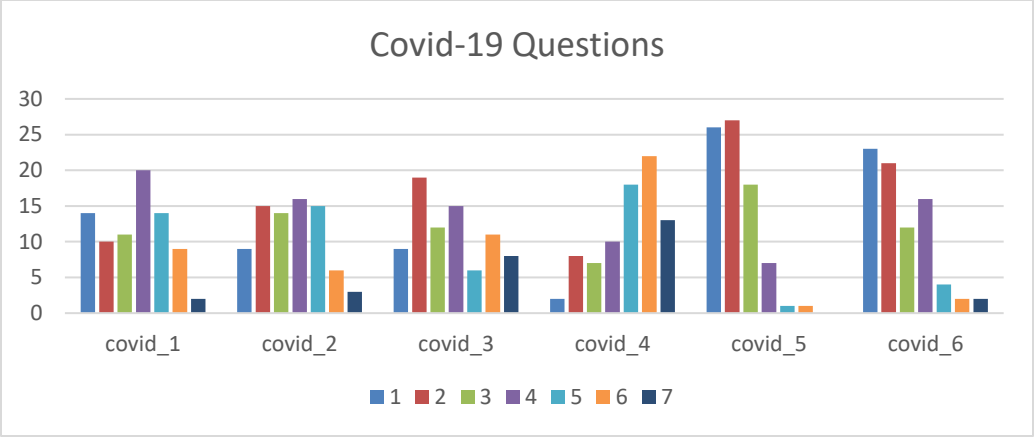
Figure 9 - Diagram Based on Table 12 (Covid Questions)

Chapter 5: Discussion & Implications

This study aimed to explore the role of relational coordination on organizational learning, and how organizational structure affects relational coordination, based on 80 respondents from different public and private organizations located in Norway.

The results of the study showed us that we could only accept four of our hypotheses. First, a high degree of formalization and was linked to increased relational coordination. Second, that a high degree of centralization will negatively influence relational coordination. Third, a high degree of relational coordination will positively influence organizational learning. The last two include the mediation effect of relational coordination on centralization and formalization. However, interdependence did not show significant relation to accept it as a moderating effect on relational coordination in this study. This chapter presents an interpretation of our findings. First, it discusses the effects of organizational structure (formalization, centralization, and specialization) on relational coordination, followed by the influence of relational coordination on organizational learning, and relational coordination as a mediator, as well as the moderator role of interdependence. As a contribution to the study, additional analysis based on the findings has also been introduced. The chapter also discloses the theoretical and practical implications of the findings and outlines the limitation of the study, including future research avenues with a conclusion at the end.

5.1 Discussion

Focus on organizational learning is essential for organizations to survive in a highly competitive and rapidly changing environment (Dodgson, 1993). Thus, the organizations need to know how to structure their organizations to facilitate innovation and organizational learning. In this thesis, we have investigated the relationship between organizational structure and organizational learning through relational coordination in the Norwegian context.

We did not find any significant relationship for the few demographic control variables in our analysis. Suggesting there is not a relationship between organizational learning and sector, age, or

industry. The age parameters got skewed because we used a too narrow age interval, and most of the respondents ended up in one category, making it hard to use in the analysis. Below we offer an interpretation based on our hypothesis which also explains our research questions (1.3).

5.1.1 The Effects of Organizational Structure on Relational Coordination

The following findings are based on Research Question 1 and are sub-divided into three sections which also interpret the results of our hypotheses H1, H2, and H3.

A) *Formalization*

The results of the quantitative analysis indicate a positive relationship between high formality and relational coordination (H1). These findings contradict our hypothesis and other studies that high formalization will negatively influence relational coordination. Forcing people to coordinate in a particular way (Maravelias, 2003) will reduce flexibility (Bidault & Cummings, 1994). People will then be less incentivized to discuss and consider alternative ways to do their jobs (Robbins & Decenzo, 2001). It should be noted that this way, it will also be harder to develop strong relationships to improve relational coordination (Chen & Huang, 2007). In a democratic Norwegian society, rules and regulations are something that not only originates from or within the organization but are also imposed by the government and adds to bureaucracy. Without further studies, we cannot say that the respondents have more or fewer statutory rules than usual.

While many formalized rules in the organization hamper its adaptability (Jamali, et al., 2006)and can reduce task ambiguity. The regulations and task descriptions in an organization are formed by knowing the best practice to solve a particular problem. This way, the rules function to write down and distribute the knowledge within the organization. Giving the employees enough freedom to modify these regulations, we argue that it is easier to change routines to the task with relations than starting from scratch. Also, the relations gained by being forced to coordinate with someone on a task might build relations between people who don't have personal reasons to interact (Mintzberg, 1979). This way, it is easier to exploit the knowledge by creating an effective, streamlined organization.

However, as formalization represents rules in an organization, it is also considered to attain a standardized behavior that can lead to product/service quality with efficient operations (Galbraith, 1973). Based on the case study of the construction company (Villagarcia, 2011), the benefits of formalization will only be accomplished if the top management is committed and is convinced of its results, plus if the organizational design is based on a system approach. A system approach includes a process of rules, formalized flows, implementation plan, controls, and feedback. Formalization reduces the need to process information. As Galbraith (1973) states, more information and knowledge are transferred even with a similar number of symbols. Besides, formalization also expands the capacity to process information as it loosens up the higher hierarchies as the lower hierarchies can make their own decisions supported by the rules in the organization (Villagarcia, 2011).

Burton and Obel (1995) further mention that a high degree of formalization is an appropriate choice when the flow of information must be prudently designed to ensure correct information when required to reduce the impact of uncertainty in decision-making. Thus, the rules are especially important in an organization, and with formalization, it is easier to manage information as it soothes the coordination and control among the members (Villagarcia, 2011). For instance, based on the study, Norway has medium score on uncertainty avoidance (Warner, 2012). The agendas are often distributed before business meetings and other events including seminars, and social gatherings, to ensure a sense of order. It is because the ethos of sticking to agreed time as per the rules is highly important in the Norwegian culture to maintain a good balance between working and private life.

Additionally, formalization facilitates the employees to be engaged in quality work, which will increase their self-esteem (Deming, 1986). But contrary to this wider support for low formalization for its organizational benefits, our study shows formalization to have a beneficial effect on relational coordination, which is also in line with a substantial amount of literature that asserts formalization to have a positive impact on variety of organizational outcomes.

B) Centralization

One part of the post-bureaucratic organizational structure is low centralization. The results showed a negative effect on relational coordination with a high degree of centralization (H2). The results matched our expectations based on literature and previous studies. The studies show that, many employees do not appreciate the highly centralized work environments that significantly restrict their actions and responses (Lambert, et al., 2006). The Norwegian culture is characterized by flat structure (Warner, 2012) where organizational members are interested to be involved or want an active part in the decision-making process or in the decisions that affect them. There includes a supportive working environment to enhance the employee's work-life balance. With a high degree of centralization, there will be longer communication paths, with more distance between the decision-maker and the person doing the tasks. The distance, both physical and related to power, will make it slower and more challenging, if not impossible, to create a dialogue to discuss how to solve a problem (Fiol & Lyles, 1985).

Decentralization generates much participation among and of the employees, who acquire a fundamental relevance (Fiol & Lyles, 1985). That is because the organization tries to retain its potential employees with the ability and capacity to generate knowledge and organizational learning. Likewise, in an organization with low centralization, there will be higher social interaction (Chen & Huang, 2007) and fewer restrictions for whom people coordinate with contributing to the development of possible relations (Fiol & Lyles, 1985) and increasing the quality of communication. Similarly, a high degree of autonomy is observed in Norwegian work culture in both what employees do and how they do it. Thus, we agrue that, the structure helps departments coordinate and enables synergy effects for relational coordination when more than one department can work on the same issues.

Our findings from centralization also supports the argument of Fiol and Lyles (1985) that, decentralization allows changes in the behavior, beliefs, and actions of the individual. In the context of Norway, the decision is consensus-driven (Warner, 2012) which allows the organizational team members to build trust and create ownership and commitment to the tasks. It provides opportunities for the employees to learn from their co-workers that help to widen the employee's vision and mission of the organization, thereby increasing relational coordination. Furthermore, to facilitate the social interaction between the members, knowledge workers who

have wider skills, experience or expertise, would require greater autonomy and self-regulation (León & Martinez, 2011) from which we conclude that, a low degree of centralization is highly recommended in an organization.

C) Specialization

We did not get any significant results to accept our hypothesis that a low degree of specialization will impact relational coordination, as shown in table 6 (H3). Specialization is recognized to increase fragmentation and undermine coordination between functions (Gouldner, 1954; Merton, 1940; Selznick, 1949), consistent with our hypothesis. When specialization goes too far, the actors will be too focused on their tasks and expertise (Pichert & Anderson, 1977), reducing shared goals, mutual respect, and shared knowledge.

We believe this to be true for relational coordination between different functions or centers of expertise. But our findings might indicate that there also are other effects in play. And we suggest, as Gittel, et al. (2008), that reduced relational coordination of high specialization between functions is counteracted by increased relational coordination within the same field due to a better understanding of the work. Complex knowledge of highly specialized individuals is shared more effectively through strong relationships (Ancona & Caldwell, 1992; Hansen, 1999; Szulanski, 1996), which implies that it should be increased quality of relational coordination within these specialized units.

In the context of the feminine Norwegian organizational culture, we might expect somewhat different results than more masculine cultures (Sørnes, et al., 2004). However, its rare to come by heated arguments or strong disagreement in the interdependent society it is in Norway (Warner, 2012). Therefore, by not investigating the differences between the specialized units and the organization, we got no clear indication of the effects of specialization in this study.

5.1.2 The influence of Relational Coordination on Organizational Learning

As suggested by the theory, the quantitative analysis in the study also resulted in a positive relationship between relational coordination and organizational learning (H4). As described

above, relational coordination is theorized to support organizational learning. The hypothesis has also been tested in other studies and findings have been largely supportive. For instance, the findings on relational coordination and organizational learning discovered that the quality of relationships; shared goals, shared knowledge, and mutual respect were strongly associated with the capacity to learn from the failures in software, electronics, and finance corporations (Carmeli & Gittell, 2008). We can also support this statement in the Norwegian context, where there exists a high degree of trust among employees that every individual contributes to the common goals and objectives of the organization.

The higher the coordination among the members of the organizations, the higher and positive the environment, and the outcome will be. At the same time, relational coordination enables organizations to increase efficiency by helping them to manage interdependence among their tasks. Additionally, it is also observed that the shared knowledge, goals, and trust in the organization helps in producing positive outcomes for the employees who experience it from their colleagues (Gittell, et al., 2021). For instance, in the feminine society of Norway, interaction through dialog and growing insights are valued to encourage the self-development of the employees in an organization (Sørnes, et al., 2004). Moreover, when there is frequent communication across organizational boundaries and when the organizational members are engaged in problem-solving and timely communication, we argue that they can create and implement opportunities to identify those results and encourage organizational learning.

The low-quality relationships are expected to have the opposite effect, undermining the quality of communications and hampering the employee's ability to coordinate efficiently. As theory recommends, employees with high-quality relationships at work can gain access to the resources they require to successfully achieve their task while enhancing their well-being through the intrinsic benefits of high-quality relationships at work (Dutton & Heaphy, 2003). Therefore, as expected from the hypothesis and our findings, we conclude that relational coordination drives outcomes such as superior quality, higher efficiency, and promotes worker well-being, increasing the potential of organizational learning (Dutton & Heaphy, 2003).

5.1.3 The mediating role of Relational Coordination

From an organization's point of view, the basic concern of relational coordination is how it coordinates within different functions or departments (Gittell, 2000). The distinctive point about relational coordination is how the dimensions are combined in a package capable of aiding our understanding in the nature of the effects of coordination of the work and thus, enabling organizational learning. The results of our quantitative analysis in the mediator role of Relational Coordination indicate three different results from the study (H5a, H5b, H5c).

First, it demonstrates that relational coordination will mediate a strong relationship between formalization and organizational learning. This significant relationship suggests that a set of formalized practices may foster strong relational coordination by enabling organizational learning. Formalization allows a clear guideline of individuals' tasks activities and their performance expectations by providing enough knowledge about one's potential or personal effectiveness (Mustafa, et al., 2019). We support this statement because a lack of such structure may create a situation for the employees to concur on their roles and responsibilities. With the formal structure, employees can always turn to procedure guidelines whenever there is a problem or chaos in an organization. Furthermore, we also argue that the formalized structure allows employees across the departments or the same sector to communicate and share information/resources easily. In this way, not only the members but the divisional structure can also coordinate effectively by having common shared goals and knowledge.

Second, the study also resulted in a positive relationship between centralization and organizational learning when relational coordination plays a mediating role. It implies that creating a participative environment for the employees and an inclusive decision-making process is important to the occurrence of organizational learning. The study shows that people in Norway show the same level of respect and attitude and are provided with equal rights despite the differences in their designation (Warner, 2012). By providing enough opportunities to the employees to perform their work without any intervention in hierarchy and control would create a good work setting (Mustafa, et al., 2019) to build shared goals, shared knowledge, and mutual respect and will empower organizational learning. For instance, the national culture in Norway is characterized by a low power distance (Warner, 2012), implying that the power is decentralized, and employers rely on the experience of the organizational members. The mutual trust among

them facilitates participative communication and thus enables the organization to generate learning and knowledge.

Lastly, our study showed no significant results that relational coordination would mediate the relationship between specialization and organizational learning. Where a low degree of specialization requires employees to carry out many different and varied tasks, implying that the workers will learn and improve different skills. A high degree of specialization where people do a small amount of non-varied tasks may create difficulty for the organization members to improve their range of perspectives reducing their possibility of acquiring added knowledge. In this case, the organization's overall goal is to enhance work productivity further and reduce the expertise required, directly affecting the individuals and their positive learning capacity, thus negatively impacting organizational learning (León & Martinez, 2011)

5.1.4 Interdependence as a moderator

We looked at how interdependence might have a moderating effect on centralization and formalization to understand the organizational structure's impact better (H6a, H6b). Specialization was excluded in this analysis because it did not show any significant effect on the model. We hypothesized that the relationship between the structural variables of formalization and centralization is moderated by task interdependence. We suggested that a higher degree of interdependence would increase the need for communication to clarify information because of uncertainty (Daft & Lengel, 1984). Thus, it would improve relational coordination when more opportunities to communicate and develop stronger relationships (Heckscher, 1994). Based on low loadings and high p-values shown in table 8, our study found that interdependence does not moderate the effects on relational coordination by centralization and formalization in organizations. This contradicts our assumptions about how the influence of high interdependence would increase the structural impact on relational coordination. Other studies (Gulati & Sytch, 2007; Gundlach & Cadotte, 1994; Saavedra, et al., 1993) found interdependence to be a moderating variable.

When task interdependence is low, people can do their work relatively autonomously with little regard for other participants in the process (Gittell, et al., 2008). Formalization changes this

statement by how the rules and regulations are created based on the best practices of different people ((Fernández-Mesa, et al., 2013). We argue that in the Norwegian context, where a hybrid structure seems to be the best fit to improve organizational learning through strong relational coordination, the benefits of formalization help to negate the positive effects, as we see in other studies. Formalization reduces uncertainty and brings some structure to how the coordination work in the organization. Thereby lessen the importance of interdependence as a moderator.

Low centralization will also help keep people interested in each other's work and increase relational coordination without the need for task interdependence to incentivize more high-quality communication within the organizations. The contingency theory recommends that the need for relational coordination will be higher in the work settings where there is a high degree of interdependence in the work process; especially when the processes are time-constrained and uncertain (Gittell, 2000). In Norway, many meetings with a high degree of diplomatic decision-making are the norm, making everyone at least partially responsible and invested in the decisions. In summary, we suggest that interdependence is still important, but the hybrid structure and Norwegian context will reduce the importance of interdependence as a moderator.

5.2 Additional Analysis

5.2.1 Dimensions of Relational Coordination

As mentioned earlier, relational coordination is divided into two dimensions, the quality of relationships and the quality of communication. To further explore the effects of relational coordination, we analyzed how the two dimensions influence organizational learning and the influence of structure on the two dimensions (Carmeli & Gittell, 2008). We have already established the link between relational coordination and organizational learning. In this additional analysis, we found that communication has no significant relationship with organizational learning by itself, which means that communication becomes important for organizational learning when combined with quality relationships. The synergy effects between these dimensions increase the loading of relational coordination to organizational learning when put together, confirming what Newcomb (1956) says about mutual influence between communication and

relationships. And how the web of relationships is reinforced by the frequency, problem-solving, accurate and timely nature of communication (Gittell, 2011).

5.2.2 The impact of Covid-19 in an organization

Even though the office-centric or 9-5 have been believed to be the best thing for the organizations, now we see that because of the Covid-19 pandemic, the employees and the companies have embraced the new change as an opportunity to grow. For example, Nike embraced modern technologies and worked together in teams to allow more stock to be traded online than ever before. As employees in almost every sector were forced to work from home, we expect a difference in productivity, building relationships and communications for which we were intrigued to conduct an additional study from our questionnaire.

Due to Covid, the balance of power in teams and organizations has also been noticed, as for some leaders it has created an opportunity to get things quickly without having to consult or collaborate. Major studies show that it has led to bruised relationship and weaken the collaboration and communication among the teams (Edmondson, 2021). Consistent with the reasoning, our study shows most of the respondents (table 12) strongly disagreed to easily develop relationships while working from home (covid_5), while most respondents agreed or strongly agreed on finding it hard to collaborate in larger teams while working from home (covid_4) including that they don't prefer teamwork digitally (covid_6).

Several studies have presented changes in productivity while working from home on both individuals and firms during Covid-19 shutdown. Based on the study (Barrero, et al., 2021), in the U.S, most respondents who have practiced working from home reported higher productivity than expected before the start of the pandemic. In our study, when we asked if they wanted to continue with the home office after the pandemic, we did not get any definitive answer. Indicating an indifferent attitude and possibly that the home office should be used more after the pandemic, but not exclusively. The home office works best for relatively independent tasks when knowledge is codified and can be communicated from a distance. For some organizations, the work is conducive to a combination of digital and in-office. Edmondson (2021) argues that the hybrid approach may not work if the employee has a choice to come in when they want to, and thus, it

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must be structured so that all the employees are together in predictable ways for the parts of the work that present the most interdependence.

However, even if the situation reverts to normal, the pandemic is likely to leave a permanent mark (maybe both i.e., positive or negative) on organizational structure as for the changes in the economic fundamentals; technology, scarcity, or preferences may not bounce back to pre-disruption level (Foss, 2020). He further argues that the organizations can decide on the intensity they use technology interdependency pairs because the pandemic makes reciprocal interdependencies tougher to organize due to required direct and physical interactions. Consequently, the organizations may have to pre-plan about the task execution as there will be fewer prospects for real-time coordination and interaction resulting in the task interdependencies shift towards the pooled or sequential category (Foss, 2020). Also, the organization's permanent traces may include specialization, bundling, or sequencing of tasks. Thus, our study may contribute to the organizations in finding an effective approach to deal with Covid-19 by reducing disruptions in communications or breakdown in teams by enabling them to attain effective measures in their structure to increase relational coordination and further create organizational learning. Doing so will support the organizations in developing the employee productivity and improve the performance level. Additionally, it supports task sequences so that highly interdependent tasks will tend to become more concentrated in technological and organizational units, which will compel organizations to focus on the work activities. Thus, the growth of digitalization created through covid may reinforce these tendencies (Lee, 2020).

5.3 Theoretical and Practical Implications

5.3.1 Theoretical implications of the Study

This study contributes to better insight into and understanding of how the organizational structure will influence organizational learning via fostering relational coordination. Our results confirm the theoretical connections between organizational structure, relational coordination, and organizational learning.

The study fulfills the gap for research on organizational learning by incorporating relational coordination in reaping the benefits of putting an appropriate structure in place to enhance their capacity to learn. The relational coordination has never been tested regarding the predictive effects on organizational learning and its role in connecting other organizational variable such as structure before, so it further helps the existing literature to identify the importance of relational coordination in a structure of an organization. Secondly, we found contradicting results on formalization as influencing negatively on relational coordination. Similarly, the results on high centralization supported the existing literature which says it negatively affects relational coordination. Our results showed no significant effect of specialization, making the interpretation limited. The relational coordination as a mediator enabled a positive relationship between a) formalization and organizational learning, b) centralization and organizational learning. Additionally, contrary to the expectations, we didn't find any moderating role of interdependence on the organizational structure and relational coordination.

Initially, we assumed a post-bureaucratic structure would result in a high degree of relational coordination and organizational learning. Our study suggests that a hybrid structure with low centralization and high formalization will result in a high degree of relational coordination. And thus give a better fit for organizational learning in a Norwegian context. Which confirms O'Reilly and Tushman's (2004) argument that organizations need to include both perspectives to accommodate both efficiencies gained by structure and the adaptability of the post-bureaucratic structure (Leana & Barry, 2000).

5.3.2 Practical implications of the Study

This study can give Norwegian organizations a better understanding of how the organizational structure will influence organizational learning through a high degree of relational coordination at a managerial level. For organizations who want to improve their organizational learning, this study shows how the organizational structure can influence organizational learning through relational coordination. In other words, organizational learning can be enhanced by facilitating the development of relational coordination by how the organization is structured.

One of the key findings in our study shows that low centralization will positively impact relational coordination. Sharing specialized information between workers requires the centralized decision-maker to know what information the individual holds (Bogenrieder & Nooteboom, 2004). Thus, sharing this type of information should be delegated to the owner of that knowledge (Jensen & Meckling, 1992). With formalization done right, and avoiding red tape, it will increase relational coordination and organizational learning. Thereby shows that a hybrid structure with decentralization and formalization should not be overlooked by managers when deciding on organizational structure (O'Reilly & Tushman, 2004).

In a rapidly transforming environment, existing knowledge must be updated continuously (Sørensen Jesper B, 2000). But the knowledge also needs to be generalizable and distributed within the organization. Therefore, organizations must adopt structures that allow them to create and transfer more knowledge (Koohborfardhaghighi, et al., 2016). Created knowledge also needs to be exploited to generate added value for the organizations (March, 1991). Thus, we argue that, on the one hand, the flexibility of a hybrid structure facilitates both the creation and distribution of knowledge. While on the other hand, the structure enables more effective exploitation of this knowledge.

While digital media can reduce the effects of physical distance, enabling experts from different regions to interact (Stone & Deadrick, 2015). It can also be less engaging and limit opportunities to get feedback, thus reduce overall productivity (Stone-Romero, et al., 2003). From our additional questions regarding the Covid situation, we see that the respondents do not find it easier to develop personal relationships through digital media. They prefer physical meetings over digital for teamwork. Managers should address this and limit the use of digital media when working in teams because it will benefit the organization in the long run. During the pandemic, personal contact should be limited, and this study suggests that working in the office, but with reduced personal interaction, will reduce the efficiency just as much as working from home. While digital media can mitigate the effects of physical distance, enabling experts from different regions to interact (Stone & Deadrick, 2015). It can also be less engaging and limit opportunities to get feedback, thus reduce overall productivity (Stone-Romero, et al., 2003). From our additional questions regarding the Covid situation, we see that the respondents do not find it easier to develop personal relationships through digital media, and they prefer physical meetings over

digital for teamwork. Though home office might be something that would benefit the organizations if it were limited to more individual and less interdependent tasks.

5.4 Limitations and directions for future research

5.4.1 Limitations of the Study

Although the current study provides an important step in clarifying how organizational employees fit into, and affect, relational coordination and encourages organizational learning, it has several other limitations. Thus, despite the value of our study, our findings should be interpreted with caution for the following reasons:

Firstly, this study is restricted to a specific country and therefore does not support the generalization of the results to other countries on an international basis. Due to time and resource constraints, the researcher couldn't assess the data from different countries. The quantitative research methodology generally requires a large sample size (Creswell, 2003), and this study used a limited sample size of 80 public and private organizations operating within Norway, which also caused a challenging statistical analysis. However, a larger sample size could have provided the researcher with more in-depth knowledge or robust results, even though bootstrapping was applied to enhance the robustness of the test.

Second, most of the time, researchers face problems in controlling the environment where the respondents provide answers to the questions in the survey (Creswell, 2003). For example, in this study, the responses regarding digital workspace depend on a particular time, which again is dependent on the conditions occurring during that time frame, i.e., Covid-19, February 2021.

Furthermore, relying on the quantitative data led to noteworthy results, but it also delivered limited outcomes outlined in the research. To avoid bias and ensure anonymity, this research was based on a structured questionnaire with closed-ended questions, which may have restricted respondents with limited responses based on the selection made by the researcher. In contrast, the one-to-one interviews would likely have provided complimentary insights to determine the actual perspective and participants' behavior.

5.4.2 Future Research Avenues

The limitations presented above can be seen as an opportunity for further research. In addition, the researcher may wish to pursue further studies into five different dimensions. First, for research into relational coordination, future research can be undertaken into broader frameworks to illustrate a comprehensive type of practices promoting the development of relational coordination. For example, not just in terms of organizational structure and organizational learning, but also regarding the attributes and attitudes of individual employees. Second, like organizational structure, 'coordination mechanisms', can also be included as another antecedent of relational coordination which could be examined in future research to show the relationship or to enhance organizational learning. Third, since strengthing the relational coordination ensures the positive outcome in the organizations, the future research may also study in-depth about the dimensions of the coordination (technological, behavioral, organizational systems) that may add to challenge the opportunities of inter-organizational coordination. Additionally, the findings for the hybrid are only studied from the surface level, thus, future research may include the forms of organization (bureaucratic, post-bureaucratic, and hybrid) to construct a model to benefit the study on the relational coordination. Finally, the measures, we recommend from the covid-19 are based on the experiences collected through the online surveys from the employees in February 2021. We recognize that the crisis is continuing and uncertain, thus we are aware of several changes in the strategies that might be considered necessary to adjust over time. Therefore, systematic research is required to further examine the feasibility of implementing the measures in the organization.

5.5 Conclusion

This study provides the preliminary but an in-depth understanding of the relationship between organizational structure, relational coordination and organizational learning with some interesting insights on the Norwegian organizations. For that reason, this research focuses on how organizational structure fosters relational coordination to achieve learning benefits in organizations. Our findings indicate that the organizational structures that are highly formalized and less centralized, are more likely to develop positive relational coordination through shared goals, shared knowledge, mutual respect, and communication to facilitate organizational learning. This means that a hybrid structure is best suited for the organization because it allows efficient use

of its resources, expertise, and organizational flexibility, thereby formulating healthy social interaction and participative communication to foster organizational learning. Second, the high degree of relational coordination positively influences the organizational learning, in addition to transmitting the effect of formalization and low centralization on organizational learning. Thus, the new methodology, using the model, would support future empirical research from a broader perspective.

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Appendix

Appendix 1 - Survey questions in Norwegian

Del 1 - Grunnleggende bedriftsinformasjon

Spørsmål	Svar
Sektor	- Offentlig - Privat
Omtrentlig alder på bedriften	- 0-3 år - 3-5 år - 5-10 år - Eldre enn 10 år
Næring	- Maritim næring - Finans - Offentlig tjeneste - Industri - Fiske og fangst - Vann og kraft - Bygg og anlegg - Landbruk - Olje og gass - Varehandel - Transport - IKT - Reiseliv

Del 2 - Dine synspunkt på bestemte kjennetegn på din organisasjon.

Vennligst oppgi hvor enig eller uenig du er i de følgende påstander om formalisering i din bedrift. Hvor 1 er helt uenig og 7 er helt enig

1. Informasjonen i vår organisasjon oppbevares og utveksles gjennom mange rapporter og formelle dokumenter.
2. Vi har klare mål for det daglige arbeidet.
3. Arbeidet vårt er generelt styrt av mange regler.
4. Informasjonen som er nødvendig for min jobb er skrevet ned i prosedyrer, mål og regler.
5. Jeg liker å ha en fleksibel jobb uten prosedyrer.
6. Vi koordinerer med andre enheter/avdelinger/teams igjennom uformelle personlige relasjoner.
7. Samarbeid med andre enheter/avdelinger/teams er basert på personlige relasjoner.

Vennligst oppgi hvor enig eller uenig du er i de følgende påstander om sentralisering i din bedrift. Hvor 1 er helt uenig og 7 er helt enig

1. Våre arbeidsmetoder er en følge av hva sjefen bestemmer vi skal gjøre.
2. Våre nærmeste overordnede bestemmer hvordan vi skal gjennomføre arbeidet.
3. Avgjørelsene til våre overordnede bestemmer hvordan vi jobber.
4. Sjefene våre har stor innvirkning på hvordan vi gjør jobbene våre.
5. Jeg kan ta noen avgjørelser uten tillatelse fra sjefen.
6. Jeg blir ofte spurt om mine innspill til nye aktiviteter.
7. Vi snakker direkte med våre personlige kontakter uten å snakke med sjefen først.

Vennligst oppgi hvor enig eller uenig du er i de følgende påstander om spesialisering i din bedrift. Hvor 1 er helt uenig og 7 er helt enig

1. Vi har mange spesialister som gjennomfører spesielt definerte oppgaver.
2. De fleste som jobber her er generalister som gjør mange forskjellige oppgaver.
3. Vi forventer at våre ansatte er eksperter kun på sitt eget ansvarsområde.

Vennligst oppgi hvor enig eller uenig du er i de følgende påstander om gjensidig avhengighet i din organisasjon. Hvor 1 er helt uenig og 7 er helt enig

1. Medlemmene i vår enheter/avdelinger/teams er avhengige av andre for å gjennomføre arbeidet.
2. Medlemmene i vår enheter/avdelinger/teams er avhengige av andre for å få informasjonen og utstyret for å gjennomføre jobbene sine.
3. For å oppnå målene i våre enheter/avdelinger/teams er vi avhengige av støtte og tjenester fra andre enheter/avdelinger/teams.
4. Etter medlemmene i din enhet/avdeling/team er ferdige med sine oppgaver er dere avhengige av at andre enheter utfører de neste stegene i prosessen før arbeidet er gjennomført.

Vennligst oppgi hvor enig eller uenig du er i de følgende påstander om kvalitet i din organisasjon. Hvor 1 er helt uenig og 7 er helt enig

1. I denne organisasjonen kommuniserer vi ofte på tvers av avdelinger/enheter.
2. Kommunikasjonen mellom arbeidsgruppene skjer til forventet tidspunkt.
3. Det er en nøyaktig utveksling av informasjon mellom arbeidsgruppene i denne organisasjonen.

Vennligst oppgi hvor enig eller uenig du er i de følgende påstander om kvaliteten på relasjonene i organisasjonen. Hvor 1 er helt uenig og 7 er helt enig

1. Arbeidsgruppene våre deler en felles visjon.
2. Arbeidsgruppene våre jobber mot felles mål.
3. De ansatte i denne avdelingen vet hvilke arbeidsoppgaver kollegaene i andre avdelinger gjør.
4. I denne organisasjonen deler vi med hverandre hva vi jobber med.
5. Samtaler om arbeidsoppgaver mellom kollegaer gjør at vi bedre forstår behovene til hverandre.

6. Samtaler mellom kollegaer om arbeidsoppgaver gjør oss i stand til å bedre forstå hvordan våre handlinger påvirker andre kollegaer.

7. Det er stor grad av respekt mellom oss kollegaer på jobb.

8. Når noen deler sine meninger så respekterer vi det.

Vennligst oppgi hvor enig eller uenig du er i de følgende påstander om læring i organisasjonen. Hvor 1 er helt uenig og 7 er helt enig

1. Organisasjonen vår henter og deler ny og relevant informasjon på tvers av enhetene som er viktig for organisasjonens ytelse.

2. Medlemmene i organisasjonen tilegner seg noen kritiske evner og ferdigheter som forbedrer organisasjonens ytelse.

3. Organisatoriske forbedringer har blitt fundamentalt påvirket av ny kunnskap som har kommet inn til organisasjonen.

4. Dette er en lærende organisasjon.

Del 3 - Helt til slutt noen spørsmål rundt hvordan Covid-19 pandemien har påvirket arbeidssituasjonen i denne organisasjonen.

Hvor 1 er helt uenig og 7 er helt enig

1. Jeg ønsker å fortsette med hjemmekontor etter pandemien.

2. Jeg har mer handlingsfrihet når jeg jobber hjemmefra.

3. Jeg føler meg mindre produktiv når jeg jobber på hjemmekontor.

4. Jeg synes det er vanskeligere å samarbeide i store grupper når jeg jobber hjemme.

5. Jeg synes det er lettere å bli kjent med de jeg jobber med når kommunikasjonen går digitalt.

6. Jeg foretrekker team-arbeid digitalt framfor fysisk.

Appendix 2 – Survey questions in English with sources

1. What is the age of your firm? (0-3 years, 3-5 years, 5-10 years, more than 10 years)
2. What is the type of your organization? (Public, Private)
3. What Industry do you work for? (Healthcare, Administration, Offshore, Shipping, Transportation, IT)

4.	Formalization	Source
form_1	Information is mainly held in and exchanged through many reports and formal documents.	Willem and Buelens, 2009
form_2	We have clear goals for our daily work performance.	Willem and Buelens, 2009
form_3	In general, our work is subject to innumerable rules.	Willem and Buelens, 2009
form_4	The information that is required to do my job is laid down in procedures, goals and rules.	Willem and Buelens, 2009
form_5	I enjoy job flexibility, without working procedures.	Lambert et al., 2007
form_6	We coordinate the activities with the other unit informally via personal contacts.	Willem and Buelens, 2009
form_7	Cooperation with the other unit is based on personal contacts in that unit.	Willem and Buelens, 2009
5.	Centralization/autonomy	Source
cent_1	Our work methods follow from the decisions of our supervisors.	Willem and Buelens, 2009
cent_2	Our direct supervisors decide how we should execute our tasks.	Willem and Buelens, 2009
cent_3	Decisions of our supervisors determine how we work.	Willem and Buelens, 2009

cent_4	Our bosses have large impact on our way of working.	Willem and Buelens, 2009
cent_5	I can take some actions without a supervisor's permission.	Dewar et al, 1980
cent_6	I am frequently asked about my inputs on the adoption of new programs at this organization.	Dewar et al, 1980
cent_7	We confer directly with our personal contacts without consulting our supervisors.	Willem and Buelens, 2009
6.	**Specialization**	**Daugherty et al. 2011**
spec_1	Our firm has many "specialists" employees who perform narrowly defined sets of activities.	"
spec_2	Most of our firm's employees are "generalists" who perform a wide variety of tasks (reverse coded).	"
spec_3	In this organization, we expect our employees to be experts only in their areas of responsibility.	"
7.	**Interdependence**	**Willem and Buelens, 2009**
inter_1	The members of your unit depend on the others unit for doing their respective jobs.	"
inter_2	The members of your unit need to rely on the other units to obtain the information and materials needed to their task.	"
inter_3	To accomplish your team/unit objectives you need services, support, and resources from the other units.	"
inter_4	After your unit members finish their part of the task, you need to rely on the other units to perform the next steps in the process before the total task or service is completed.	"
8.	**Quality of communication**	**Gittell, 2009**
qualcom_1	In our organization, we have frequent inter-departmental communications.	"

qualcom_2	In our organization, there is timely communication between our work units.	
qualcom_3	There is an accurate exchange of information between work units in this organization.	" "
9.	**Quality of relationships**	**Carmelli and Gittell, 2009**
qualrel_1	1. In this organization, work units share a common vision.	"
qualrel_2	2. in this organization, work units act toward common goals.	"
qualrel_3	3.employees in this organizational units know what tasks their co-workers in other units deal with.	"
qualrel_4	4. in this organization, we share with one another the subjects we work on.	"
qualrel_5	5. sharing with one another in the context of work enables us to better understand the needs of each other.	"
qualrel_6	6. Sharing with one another about our work issues enables us to better understand how our actions impact other co-workers.	"
qualrel_7	7. there is a great deal of respect between one another at work.	"
qualrel_8	8. when someone expresses her/his different opinion, we respect it.	
10.	**Organizational learning**	**García-Morales, V. J., Jiménez-Barrionuevo, M. M., & Gutiérrez-Gutiérrez, L. (2012)**
orglear_1	Our organization acquires and shares new and relevant information across the units that is important for organization's performance.	"
orglear_2	The members of the organization acquire some critical capabilities and skills that enhance the organizational performance.	"
orglear_3	Organizational improvements have been influenced fundamentally by new knowledge entering the organization.	"
orglear_4	The organization is a learning organization.	"
11.	**Covid**	**Self-made**

covid_1	I would like to continue with home office after the pandemic.	"
covid_2	I have more freedom in decision making while I choose to work from home.	
covid_3	I feel less productive when working at home.	"
covid_4	I find it hard to collaborate in larger teams while working from home.	
covid_5	I find it easier to develop relationships among my teammates while working in digital space.	"
covid_6	I prefer teamwork digitally rather than physically.	"
		"
		"