

# **DIGITAL INTERACTIONS**

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**A QUALITATIVE STUDY OF KNOWLEDGE CREATION  
RELATED TO WORKING REMOTELY**

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Bachelor Thesis

Stockholm School of Economics

2021



## Abstract

The Covid-19 pandemic has introduced a widespread experiment, where working remotely has become the new normal for a large part of the global workforce. This creates many opportunities for organizations, however, the lack of face-to-face interactions raises concerns related to the impact on knowledge creation, not least socialization. Meanwhile, the business climate has during the last decade become more complex, stressing the utilization of knowledge to attain a competitive advantage. Previous research indicates that remote work may affect knowledge processes which this thesis aims to investigate further. This is done through the theoretical lens of knowledge creation (SECI-process), interaction ritual chains, and charismatic leadership. Through a qualitative case study in a manufacturing company, 11 in-depth interviews were conducted. Our findings imply that knowledge tends to be narrowed down to an explicit form when working remotely, hence reducing socialization among employees. Initially, this seems to accelerate knowledge creation due to new stimulating conditions supported by previous physical interactions embedded as knowledge assets in the firm. For the longer term, however, the reduced socialization appears to weaken energy, commitment, and organizational culture which imposes risks for knowledge fragmentation hence negatively affecting knowledge creation processes. Findings from this study contribute to theory and practice as they provide new insights to the research field and increase the understanding of how to manage working remotely in a way that fosters knowledge creation.

*Keywords: Knowledge creation, SECI, Interaction rituals, Remote work, Digitization*

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Bachelor Thesis  
Bachelor Program in Management  
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## **Acknowledgements**

We would like to express our gratitude to all the individuals that provided the invaluable inputs that made this thesis possible. First, we'd like to thank the employees at the case company, who showed enormous flexibility, patience, and openness during long and intensive interviews. Furthermore, we'd also like to thank our supervision group for valuable discussions and for the many fun and insightful supervision meetings throughout the spring. Finally, we extend our gratitude to our supervisor Max Jerneck for always challenging us to develop and improve the content and for your endless support.

Fredrik and Vendela  
Stockholm  
May 16th, 2021

## Definitions

Concept	Definition
Digitization	“Digitization is the process of changing from analog to digital form, also known as digital enablement. Said another way, digitization takes an analog process and changes it to a digital form without any different-in-kind changes to the process itself.” (Gartner Glossary n.d.)
Remote work / Working remotely	“Remote work implies that employees geographically work outside of the area of the organization’s office and new tech-driven work practices are introduced around communication and collaborations, e.g. teleconferencing.” (Kominers, Gonzalez 2020)
Flexible work arrangements	Flexible work arrangement is defined as when an “employer provides benefits that permit employees some level of control over when and where they work outside of the standard workday” (Lambert, Marler, & Gueutal, 2008, p. 107)
Information Communication Technology (ICT)	“ICT or ICTs refers to technologies applied to gather, share and distribute information, and communicate by use of computers and networks.” For example, <i>Microsoft Teams</i> . (Antonelli et al., 2000)
Knowledge	Knowledge is “Justified true belief.” Or “when information is put into a context, it becomes knowledge” (Nonaka et al. 2000)
Knowledge workers	“Knowledge workers refers to employees whose jobs involve developing and using knowledge rather than producing goods or services.” (Cambridge Dictionary n.d)
Explicit knowledge	“Explicit knowledge can be expressed in formal and systematic language and shared in the form of data, scientific formulae, specifications, manuals and such like. It can be processed, transmitted, and stored relatively easily.” (Nonaka et al. 2000)
Tacit knowledge	“Tacit knowledge is highly personal and hard to formalize. Subjective insights, intuitions, and hunches fall into this category of knowledge. Tacit knowledge is deeply rooted in action, procedures, routines, commitment, ideals, values and emotions.” (Nonaka et al. 2000)
Knowledge creation	“Knowledge creation is a continuous, self-transcending process through which one transcends the boundary of the old self into a new self by acquiring a new context, a new view of the world, and new knowledge.” (Nonaka et al. 2000)
Organizational knowledge creation	“In organizational knowledge creation, neither micro nor macro dominates. Where each self-transcending process interacts with each other to evolve into a higher self.” (Nonaka et al. 2000)
Knowledge fragmentation	“Knowledge fragmentation is when knowledge is dispersed around an organization and its existence and/or whereabouts is unknown making it inaccessible.” (IGI global n.d.)

Table 1: Definitions

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# 1. INTRODUCTION

## 1.1. Background

The pandemic has introduced a huge experiment in widespread remote working and posed unprecedented challenges to economies, industries, and not least, the global workforce. Due to social distancing requirements, organizations have been forced into “*rapid big bang introductions*” of tech-driven practices in an extraordinary time-pressured manner (Carroll, Conboy 2020). To maintain “*business as usual*”, workers have needed to adapt quickly by undertaking non-conductive remote working arrangements and sometimes unfamiliar Information Communication Technologies (ICTs) (Waizenegger, McKenna et al. 2020). Remote working, teleconferencing, and “digital socialization” are all examples of activities that previously weren’t expected to be a part of employees’ every-day-lives until several years in the future. The pandemic has seemingly brought widespread and enduring impacts on human behavior, communication, and future organizations. On one side, working remotely seems to offer notable benefits to organizations and their employees. Companies can reduce real estate costs, hire- and use talent globally, reduce commute, and some research indicates potential benefits from productivity gains (Bloom, Liang et al. 2015, Kaushik, Guleria 2020). However, many concerns regarding the effects of remote work persist, and among those are not least, knowledge creation including communication, brainstorming, problem-solving, camaraderie, and socialization (Choudhury 2020).

In parallel, the competitive landscape, and even societies are changing rapidly (Schwertner 2017). Whether an organization becomes effective in this landscape is determined by its ability to make better choices, and this can only be accomplished if decision-makers are knowledgeable (Nonaka, Ikujiro 1994). Thus, for organizations to achieve and maintain a competitive advantage, they need to be able to utilize their intellectual capital, enabled by transferring and creating knowledge (Asprey 2003). Paradoxically, several parts of knowledge creation traditionally have a stronghold in the physical sphere where people can socialize face-to-face (Nonaka, I., Konno 1998). Consequently, indications point that working remotely results in difficulties transferring and creating especially tacit knowledge that often builds on emotions, values, and commitment (Griffith, Sawyer et al. 2003). From this also follows that some people may have to rethink their leadership-strategies, as the lack of physical interaction may change the power of charisma as a tool for leading knowledge visions (Collins 2020a, Nonaka, I., Konno 1998). The complexities are even further extended in manufacturing industries as some processes require employees to be on-site while others may work remotely.

Given these extraordinary circumstances, many organizations are now standing at the cross-road whether to go back to their previous working model, implement flexible working arrangements, or go fully remote as the pandemic ease. A Gartner survey reveals that 82% of company leaders are planning to allow employees to work remotely to some extent (Baker M., 2020). Meanwhile, the academic literature has in this early stage little to say on how to manage and stimulate organizational knowledge when working remotely. In particular, the knowledge effects of excluding face-to-face interactions.



Altogether, this captures the essence of this study which is to investigate remote work in a complex manufacturing environment in relation to knowledge creation.

## 1.2. Previous research and research gap

When investigating the research field, several themes are crystallized. The first theme consists of knowledge studies focusing the investigation on knowledge effects related to working via technical tools (e.g., Henderson 1998, Bento, Duarte et al. 2004, Becker, Salvatore et al. 2005, Griffith, Sawyer et al. 2003). This is followed by the second field investigating effects on knowledge when working physically separated (e.g., Alavi, Tiwana 2002, Cowan, David et al. 1999, Stasser, Vaughan et al. 2000). Lastly, several studies have investigated components that indirectly construct knowledge e.g., related to job satisfaction, productivity, and fewer distractions as an output of working remotely (e.g., Bloom, Liang et al. 2015, Choudhury, 2020, Sewell, Taskin 2015).

Based upon this, the interplay of three main areas constitutes the research gap for this paper. Firstly, previous research lacks an in-depth answer to how the loss of physical interactions directly impacts knowledge creation and the leaders trying to drive knowledge creation processes. Secondly, the pandemic has dramatically changed the view and introduction of working remotely, where studies are yet to answer how these abnormal circumstances have affected knowledge creation while introducing remote work. Thirdly, limited research has been conducted on how a remote setting affects manufacturing companies in terms of knowledge creation, where some workers always must be physically on-site.

## 1.3. Purpose and research question

Considering the existing research gap, this thesis hence aims to investigate the absence of physical interactions' impact on knowledge creation processes in a manufacturing company. To receive a nuanced view of the area, a qualitative case study has been conducted through a theoretical framework constructed of Nonaka and Ikujiro's (1994) theory of *knowledge creation* extended by *interaction ritual chains* (Collins, 2014), and *charismatic leadership* (Conger, Kanungo 1994). By doing so, the authors hope to bring new insights to the research field while increasing understanding for practitioners on how to organize work arrangements to sustain knowledge as a source for competitive advantage. Therefore, our research question is stated as follows:

***How is knowledge creation affected by working remotely?***

## 1.4. Case setting

### 1.4.1. Company

The chosen case company is a well-established mid-sized manufacturing firm within the energy sector in Sweden. Today, the company hires around 150 employees, where approximately half the workforce is in manufacturing and the remaining in office-based knowledge-intensive roles e.g., sales, construction, and project leading. As the pandemic struck, the company went through a transition from working fully on-site to encouraging all office workers to work remotely. When determined crucial for business operations to function, some flexible arrangements were implemented. The current work model is said to be maintained to at least August 31, 2021. Similar to many other organizations introducing remote work, ICTs have been implemented to replace most internal and all external communication. Hence, *Microsoft Teams* now constitute the prior platform where knowledge is transferred between physically separated employees. For a brief illustration of the workflow scheme and division of employees during the time of the study see appendix 7.2 and 7.3 respectively.

### 1.4.2. Covid-19

From the middle of March 2020, national regulations and general guidelines were applied to prevent the spread of the virus including recommendations for companies to initiate remote work (Folkhälsomyndigheten 2021). Following the abnormal circumstances, four primary context-specific factors have been identified. These are that (1) working from home has been introduced as a *temporary* construct, which seems to have brought greater acceptance towards the change. (2) The *risk of infection* imposes injustices as on-site workers are being put in danger. (3) *Everyday quality of life* has, in general, been negatively affected, due to less joyful leisure time hindered by governmental restrictions. (4) The pandemic has generated uncertainties and a *sense of "chaos"* which has forced organizations to reconsider business strategies and innovate under extreme time-pressure. These are considered to impact the study's *transferability* and *applicability* to practitioners in the post-pandemic era and are revisited in section 6.2.3.

## 1.5. Delimitation of the study

This study is delimited to analyze the effects on knowledge creation in a manufacturing company having both remote and on-site workers. As the research question aims to investigate the impact of remote work, on-site interactions between factory workers are not the primary scope but rather interactions, where ICTs are used. These interactions hence include communication between remote workers and the critical communication between factory workers and remote workers. Furthermore, the introduction of ICTs is delimited to simpler programs for facilitating communication and data storage, as these are used by the case company and is representative for many other organizations at the times of this study. Further, looking at the use of knowledge in management, there has been criticism that emphasize conceptual ontological incoherence, vagueness, and breath (Alvesson, Kärreman 2001). To bring clarity regarding knowledge as a concept, this paper is delimited to analyze knowledge as a dynamic phenomenon created in social interactions in accordance with Nonaka et al. (2000). Considering the time horizon, the

authors have also chosen to delimit their focus on knowledge creation based on empirical findings from the time of the study i.e., the early stage of research in the pandemic era. Accordingly, this study is not longitudinal.

## 2. THEORETICAL FRAMEWORK

### 2.1. Literature review

The digital era with new ways of communicating and sharing information has allowed organizations to introduce remote work which has sparked great interest among scholars (e.g., Morganson, Major et al. 2010, Iverson, Maguire 2000, Griffith 2004). Although there is no consensus regarding the long-term effects on knowledge creation due to working remotely, this section aims to provide a brief overview of the field. This will be presented by first discussing literature related to digitization, thereafter remote work exclusively, followed by the effects that remote work seems to have on related factors of knowledge creation.

Firstly, some studies say that the introduction of tech-driven practices related to working remotely enhances knowledge creation processes (Henderson 1998, Bento, Duarte et al. 2004, Becker, Salvatore et al. 2005). For example, scholars have identified virtual technologies as facilitators for primarily explicit knowledge transfer (Zack 1999, Santos 2003, Jensen, Johnson et al. 2007). Vaccaro (2009) further argues that ICTs allow employees to increase the degree of detail, precision, and complexity in the work done hence building a stronger ground, even for tacit knowledge to be exchanged among employees. On the other hand, several scholars underline the limitations of the ICTs. Griffith and Sawyer et al. (2003) argue that ICTs, in fact, tend to narrow the focus to explicit knowledge which reduces the teams' ability to utilize all available (including tacit) knowledge within the firm. Consequently, ICTs may destabilize the relationship between organizations and their employees thus hindering knowledge to be transferred to an organizational level (Griffith, Sawyer et al. 2003).

Secondly, even though remote work promises geographical access to diverse and specialized teams, some scholars argue that this setting intrinsically hinders the integration and application of the expertise (Alavi, Tiwana 2002). Research provides several explanations for this. For example, studies show that face-to-face meetings are crucial since employees to a larger extent discuss "*commonly held information*", but also manage to overhear "*uniquely held information*" (Stasser, Vaughan et al. 2000). In addition, Thomas, Sussman et al. (2001) argues that virtual environments fail to possess the mechanisms to accurately communicate context for facilitating knowledge creation. Furthermore, Rosen et al. (2007) underline barriers due to constraints on building trusting relationships as a factor that may hinder knowledge sharing.

Thirdly, previous literature provides publications researching remote work which potentially could have an impact on knowledge creation. For example, studies have shown that remote work leads to increased productivity (Bloom, Liang et al. 2015), fewer sick days (Choudhury, 2020), fewer distractions, and shorter commuting time which was argued to increase concentration (Kelliher, Anderson, 2010). On the other hand, physical separation from colleagues has shown to cause feelings of "*alienation, isolation and worry*" (Collins, 2005), as well as arising stress related to technical difficulties and general job dissatisfaction (Suh, Lee 2017). Although these studies are not directly related

to knowledge but rather problematize the remote work arrangement, they give valuable input for knowledge studies within the setting.

Ever since the introduction of the pandemic, the effects of working remotely have been a highly debated subject in the media, among renowned consultancy firms, organizations, and people of the world (see e.g., BCG 2021, Lund Madgavkar et. al 2021, O'Dwyer 2021). Considering this early stage, the academic debate still has little to say about the effect on knowledge creation in this new setting, where studies mainly have focused on the direct impacts on e.g., economics, labor markets, motivations, and well-being (Waizenegger, McKenna et al. 2020). Based upon this, the authors hence aim to shed further light to the field of knowledge creation.

## 2.2. Theory usage

Many different knowledge-based theories have permeated management literature over time (see e.g., Grant 1996, Kogut, Zander 2009, Spender 1996) that in one way or another highlights the value of knowledge as a firm asset constituting a basis for a competitive advantage (Vaccaro, Veloso et al. 2009). In order to gain a comprehensive understanding of the research question, the theoretical framework has been constructed in an abductive manner incorporating relevant theories as new interesting themes emerged. As a result, this thesis investigates knowledge through the lens of Nonaka and Ikujiro's (1994) theory of knowledge creation. This is done by focusing particularly on the most critical component of the framework in a remote setting, namely *socialization*. This, as one key variable in *socialization* is described to be physical co-presence. However, to yield a deeper understanding of the mechanisms constituting *socialization*, Collin's (2014) theory of *Interaction Ritual Chains (IRC)* is used as well as *charismatic leadership* as it's considered to drive and initiate knowledge processes (Conger, Kanungo, 1994).

## 2.3. Knowledge – definitions and distinctions

Nonaka and Ikujiro (1994) define knowledge in accordance with the traditional epistemology view of "*justified true belief*", where emphasis lays on personal belief and justification, rather than on truthfulness. Knowledge is also considered to be dynamic by definition "*since it's created in social interactions amongst individuals and organizations*" (Nonaka et al. 2000). To distinguish it from information, knowledge is information that is put into context by connecting it to personal values and beliefs (Machlup 1983).

Further, knowledge can be divided into an *explicit* and a *tacit* dimension (Dávideková, Hvorecký 2017). *Explicit* knowledge is easily transmitted in "*formal and systematic language*" and is transferred in the shape of data, handbooks, instructions, and normally in written form. On the contrary, *tacit* knowledge is difficult to formalize and takes the shape of personal perceptions and intuitions for example. As a result, *tacit* knowledge is challenging to convey and is "*deeply rooted in actions, procedures, routines, commitment, ideals, values, and emotions*" (Nonaka et al. 2000).

## 2.4. The knowledge creation process – SECI

The interaction between *tacit* and *explicit* knowledge, in turn, results in the dynamic process of knowledge creation. This process consists of four knowledge conversion modes: *socialization*, *externalization*, *combination*, and *internalization*, each being a self-transcending process (Nonaka, I., Konno 1998). Self-transcendence is the concept of expanding one's personal boundaries “*reaching out beyond oneself*” (Frankl 2011). These four types of knowledge conversion create the SECI process (Nonaka, Ikujiro 1994). The generated knowledge from the SECI-process, in turn, can offset “*a new spiral of knowledge creation*” transcending through interactions from an individual level to a group level, organizational level, and occasionally to an inter-organizational level (Nonaka et al. 2000).

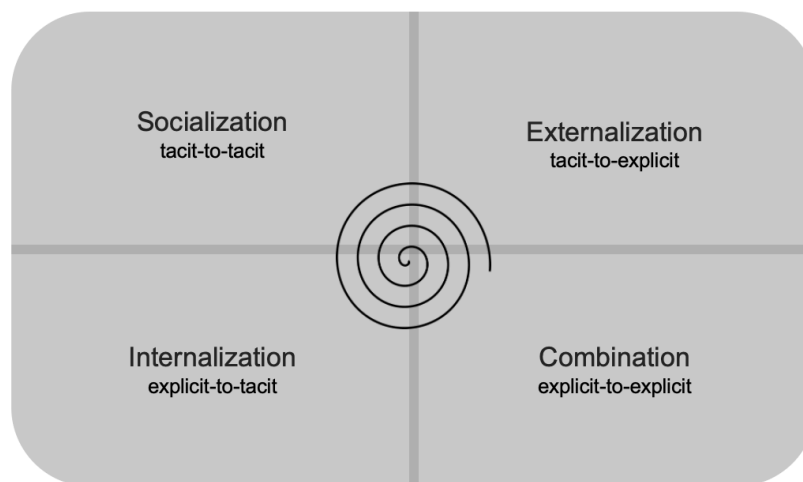


Figure 2.1: SECI Process by Nonaka, Ikujiro (1994) edited by Holmberg, Silwén (2021)

### 2.4.1. Externalization, combination, internalization

*Externalization* is the translation process of *tacit-to-explicit* knowledge. As this occurs, knowledge becomes codified which allows it to be transferred and shared with others becoming the “*basis of new knowledge*”. For example, this process could occur when engaging in quality circles and concept generation (Nonaka et al. 2000). *Combination* represents the process of putting together already existing parts of *explicit* knowledge into more advanced *explicit* knowledge (Nonaka, I., Konno 1998). Financial reports represent an example, as codified information is combined and disseminated as a more complete and advanced set of *explicit* knowledge used to take justified decisions forward (Nonaka et al. 2000). Moreover, *internalization* represents the individual integration of *explicit-to-tacit* knowledge. This is when the individual identifies valuable knowledge for her organizational role and embodies this in practice. In essence, “*learning-by-doing*” (Nonaka, I., Konno 1998). This is hence the stage where concepts such as strategies, explicit methods, and training are concretized through the job at hand (Nonaka et al. 2000). Before deep diving into the last conversion mode, namely *socialization*, factors moderating knowledge creation processes is presented.

#### 2.4.2. Knowledge assets and socialization

For knowledge creation to occur, Nonaka and Konno (1998) emphasize the physical, virtual, or mental *shared space* in which knowledge can be created. This shared space may be energized by supplying necessary conditions such as “*autonomy, creative chaos or love, care, trust and commitment*” (Nonaka et al. 2000). Several factors may also help moderate such space. Therein lie *knowledge assets* which are described to work as support functions enabling the transfer and creation of knowledge within the *shared space* (Nonaka et al. 2000).

*Knowledge assets* are defined as “*firm-specific resources that are indispensable to create value for the firm*” and are generated through the SECI-process. *Knowledge assets* can both take a *tacit* and *explicit* form. *Tacit knowledge assets* are characterized by being intangible and take the shape of energy, care, love, trust, security, organizational culture, and routines. They are created through *socialization* and *internalization*. *Explicit knowledge assets* are in contrast tangible and take the shape of manuals, documentation, and specifications generated by *externalization* and *combination*. In sum, knowledge created from the SECI-process becomes part of new *knowledge assets* within the organization, which become the foundation for new knowledge spirals to grow (Nonaka et al. 2000).

Revisiting the conversion modes, *socialization* is the where the transferal of *tacit-to-tacit* knowledge through shared experience occur (Nonaka, Ikujiro 1994). Since *tacit* knowledge is challenging to formally articulate, *socialization* is only occurring when investing time with one another (Nonaka et al. 2000). Examples of activities can be training new employees, learning through observation, and brainstorming. It may occur on and off the workplace and is facilitated by direct interaction while encouraged by “*synchronous conversations*” communicated face-to-face (Nonaka, Ikujiro 1994, Dávideková, Hvorecký 2017).

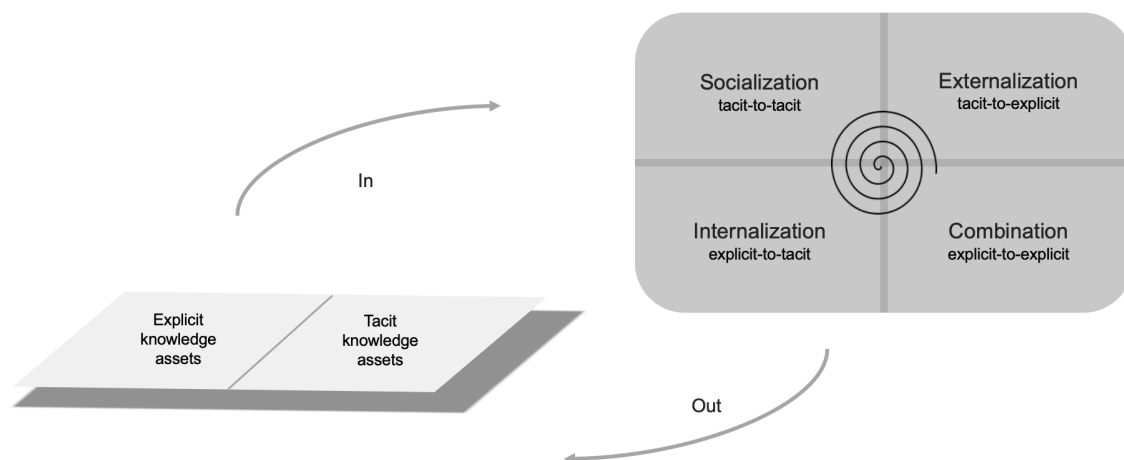


Figure 2.2: Elements of the knowledge-creating process by Nonaka et al. (2000) edited by Holmberg, Silwén (2021)

## 2.5. Interaction rituals

To further make sense of the ingredients promoting *socialization*, Collins (2014) breaks down the components of the shared experience through the concept of *Interaction ritual chains* or *IRCs*. The word ritual may indicate a narrow definition, but an *IR* can be analyzed in any social encounter. To successfully build an *IR* Collins (2014, 2020b) present four ingredients:

1. People are physically together with the opportunity to “*sense, hear and see*” each other's actions, also called “*co-presence*”.
2. In the interaction, it's clear who's speaking and who's excluded. This enables actions towards the same objectives, also called “*mutual focus of attention*”.
3. People need to share emotions, also called “*shared mood or attention*”.
4. Ritual participants get into a rhythm together such as synchronized turn-taking in speaking or physical activities such as cheering, also called “*rhythmic entrainment*”.

A successful *IR* contains all ingredients and yields the effect of *collective effervescence*, a temporary state that has long-lasting positive effects (Collins, 2014 2020b). Collins (2020b) summarizes the outcomes as follows:

- Ritual participants feel group membership or “*group solidarity*”.
- Ritual participants become energized, making them perceive themselves as confident, strong, loaded with “*emotional energy*”.
- Ritual participants develop a moral compass and loyalty towards the group and create symbols to cherish the group's existence – *feelings of morality* and *collective symbols*.

Collins (2020a) further discusses the outcomes of *IRs* as a platform where people can utilize the capacity of *emotional energy*, commitment, and charisma to conduct leadership.

## 2.6. Charismatic leadership

*Charismatic leadership* is a concept initially presented by Max Weber and is a type of legitimacy created through followers' “*faith in a leader's exemplary character*”. Charismatic leaders hold attributes such as self-confidence, energy, and enthusiasm, while they have strong tendencies “*to be creative, innovative, visionary, and inspirational*” (Conger, Kanungo 1994). Collins (2020a) emphasizes the importance of face-to-face relationships in conducting charismatic leadership. He argues that these types of relationships are most intense and incorporate all dimensions such as rhythms and emotions that together construct charisma as a concept. For knowledge (especially tacit) to be converted, charismatic leadership characteristics play an important role. This, as both formal and informal leaders, can through charisma encourage the necessary conditions such as care, trust, and commitment to, in turn, lead the SECI process while developing and encouraging knowledge assets to promote organizational knowledge creation.



Ultimately, the combined theory shown in Figure 2.2 creates a new and comprehensive lens which the authors will use to answer the research question: *How is knowledge creation affected by working remotely?*

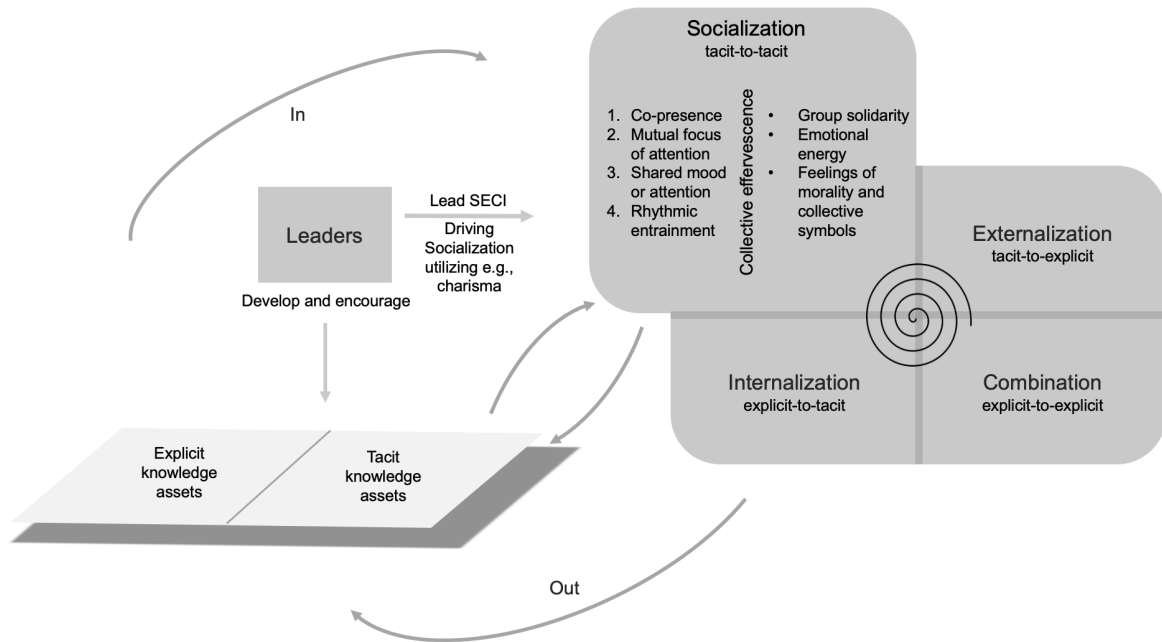


Figure 2.3: Combined knowledge framework by Holmberg Silwén (2021), inspired by Nonaka et al. (2000)

## 2.7. Theory discussion

Although widely used within the management studies, the SECI-framework has been criticized for appearing abstract, tested only in an eastern-culture setting. Other scholars also argue that knowledge transfer only is represented by two conversion modes namely *tacit-to-explicit* and *explicit-to-tacit* (Gourlay 2006, Richter 2011). However, its wide usage both in practice and theory has repeatedly proven the framework's reliability (Vaccaro, Veloso et al. 2009). Furthermore, three factors make it highly applicable for this particular study. Firstly, it has acted as a theoretical landmark within knowledge management and proven useful, especially in a case study setting. Secondly, it provides a practical tool for assessing how knowledge creation works in an organizational setting. Thirdly and lastly, its flexibility in terms of ontological levels (individual-organizational-inter-organizational) enables the authors to extend the model where appropriate, as for this thesis through the micro-sociological model of IRCs (Farnese, Barbieri et al. 2019).

The authors acknowledge the risk of combining theoretical models with the practical and methodological issues that may arise (Cairney 2013). However, this has been mitigated by an abductive process where the interplay between literature and empirics have guided the validation of components with respect its relevance for answering the research

question. Hence, the combined model is believed to fill gaps in existing theory through elaborating rather than building new (Lee, Mitchell et al. 1999, Vaughan 1992).

### 3. METHOD

#### 3.1. Research method and design

##### 3.1.1. An abductive reasoning in a constructivist ontology

In order to gain theoretical understanding within the research area of working remotely, the authors did thorough research where knowledge creation arose as an interesting concept. Although previously researched, the pandemic, interaction dynamics, and part on-site presence opened an interesting research opportunity. To understand the identified research gap, the authors allowed for empirics, theory, and literature to develop simultaneously in a back-and-forth process. This corresponds to abductive reasoning, enabling the authors to keep an open mindset for the possibility of being surprised by new empirical and theoretical insights and develop the study accordingly (Alvesson, Kärreman, 2007).

Since knowledge is transferred and created in human interactions and doesn't exist without context (Nonaka, Ikujiro 1994), it's in line with seeing the world based on human action and meaning-making rather than an existing objectivity (Bell, Bryman et al. 2019). Thus, the interpretive approach underpinned by constructivist ontology was considered well-suited for understanding how remote work appears to affect people's experience of knowledge creation. This lens supported the authors to fully capture the essence of the research question as it enables understanding based on each individual's subjective experience of the social reality in which it's entailed (Bell, Bryman et al. 2019).

##### 3.1.2. Qualitative case study with semi-structured interviews

For this paper, a qualitative case study involving semi-structured in-depth interviews in a single organization was conducted. Choosing the qualitative approach made it possible for the authors to create a nuanced picture of the participants' experiences. Combining this with the semi-structured interviews provided the opportunity to continuously follow up on interesting themes (Bell, Bryman et al. 2019). With respect to the complex linkages of knowledge creation between individuals, teams, and departments, a single case study was chosen. This enables intensive examination of the research field and to receive an in-depth understanding of the underlying complexities that might arise, which was considered important for the study implications. As previously mentioned, the authors identified theoretical gaps which they aimed to fill. The purpose was therefore to elaborate on existing theory, rather than building new (Bell, Bryman et al. 2019).

#### 3.2. Sample

##### 3.2.1. Choice of actor and interviewees

Several characteristics of the case company ensured its relevance for the study. Similar to many manufacturing industries, the company transitioned to remote work, deviating from a strong tradition of on-site presence. Consequently, the company constitutes a *representative* case during this time, while the context of the transition to working

remotely provides a *revelatory* dimension. Combined with the authors given open access to the company during a sufficient period which provides a rationale for investigating the particular case (Bell, Bryman et al. 2019, Yin 2013).

At the case company, 11 interviewees were conducted which each lasted between 40-65 minutes. All the contacted employees accepted participation. Further details are displayed in **table 3.1** including a description of the sample and the interviewees' primary work location. In order to investigate a broad range of viewpoints, a purposive interview sample was conducted with the aim to include employees from different departments, hierarchical levels, as well as work arrangements. In contrast to a random- or convenience sample, this allowed the authors to strategically choose interviewees. Therefore, the authors could create comprehensive understanding of the phenomenon and ensure fairness through the broad sample, thus bring *authenticity* to the study (Shannon, Hambacher 2014).

Interview subject	Role	Primary work location	Date of interview
Sara	Manager	Mixed	15/2-2021
Lisa	Employee	On-site	23/2-2021
Kim	Manager	Remote	23/2-2021
Daniel	Employee	Mixed	24/2-2021
John	Manager	Remote	24/2-2021
Maria	Employee	Remote	2/3-2021
Bob	Manager	On-site	2/3-2021
Martin	Manager	Mixed	2/3-2021
Eva	Employee	Remote	22/3-2021
Tim	Employee	On-site	22/3-2021
Eric	Employee	Remote	22/3-2021

Table 3.1: Interview subjects

### 3.3. Qualitative empirical data collection

#### 3.3.1. Gathering of empirics

The initial source for developing the interview guide was the different phenomenon related to Nonaka and Ikujiro's (1994) concept of knowledge creation and a thorough literature review within the field of virtual organizations. In order to test the applicability of the interview guide in relation to the chosen case company, a pilot interview with the CEO was conducted. In line with the abductive method to qualitatively gather information, this first round of empirical findings led the authors to further develop the theoretical framework. Consequently, the final interview guide was based on additional

literature, theories, and insights from the pilot interview. The finalized interview guide can be found in Appendix 7.1.

The 11 interviews were conducted via video call with all three meeting participants geographically separated to simulate real-life meetings. Interviews were conducted in Swedish as this was believed to make interviewees more comfortable and avoid potential language barriers. Consequently, presented empirical data is translated into English. Both authors were present in each interview possessing two different responsibilities, one leading the interview while the other took brief notes and followed up through clarification questions. Although this might decrease *comparability* between interviews, it allowed the authors to mitigate misunderstandings, ensure that all desired themes were covered, while gaining a deeper understanding of the socially constructed realities of each interviewee. Moreover, all interviews were recorded and transcribed shortly after each interview to minimize any non-verbal data loss e.g., pauses, expressions, and emotions which the authors included in the transcripts. Empirical saturation was reached around the ninth interview, as the two final interviews mostly repeated and aligned with previous themes.

### 3.3.2. Coding of data

In order to process the data, thematic analysis was used, thus analyzing data with the purpose of identifying “*repetitions, similarities, metaphors, and differences*” (Bell, Bryman et al. 2019). Furthermore, the data was processed separately by the authors into first-degree constructs, with the purpose of finding themes connected to the research question. For the analysis, around 60 themes were constructed. These were then clustered and developed further into around 15 second-degree themes based upon centric concepts and dimensions, in accordance with second-order analysis (Bell, Bryman et al. 2019). In this way, a comprehensive view of the empirical data was created. Lastly, third-degree themes were constructed by incorporating insights from the theoretical framework which together with reviewing literature enabled the finalized analysis.

## 3.4. Method discussion

### 3.4.1. Ethical considerations

To incorporate ethical aspects several efforts were made. In order to secure the *privacy* of the case company and the interviewees, participants were informed about their voluntary participation, the purpose of the interviews, guaranteed anonymity, and asked whether they felt comfortable with recording the interview. In accordance with GDPR regulations, the name, gender, and other personal data of each interviewee were replaced ensuring *integrity*. Additionally, only necessary information about company characteristics has been included to avoid any potential *harm* related to disclosure. Interviewees have also been able to view their transcripts if desired, to avoid any *deception*. By attending to these guidelines Diener et al.’s (1978) ethical principles permeated the study.

### 3.4.2. Trustworthiness

In interpretive research, no single truth is believed to exist. As the thesis follows this research approach, the concept of *trustworthiness* and its implications on the research design is discussed (Bell, Bryman et al. 2019). To begin with, the authors acknowledge the limitation of investigating knowledge creation in a remote setting via video conferencing. The format itself makes it difficult to study implicit expressions (Bell, Bryman et al. 2019), and becomes even more complex when trying to study digital interactions virtually as this study aims to do.

However, several measures have been taken in order to increase *credibility* and understanding of the interviewees. For example, the authors had extensive ongoing contact with the case company, to receive the necessary *prolonged engagement*. Furthermore, the authors tried to secure multiple perspectives from each part of the organization, via the purposive sample. Together with seeking sufficient interview lengths to analyze all prominent elements, this promoted *persistent observation*. In the meantime, the authors continuously encouraged the interview subjects to repeat and use examples of what they meant to ensure that information was not recreated incorrectly, hence pursuing *member checks* (Schwandt, Lincoln et al. 2007). Moreover, an evident issue in qualitative research is *transferability* (Bell, Bryman et al. 2019). In order to increase this, the authors have identified situation-specific factors (see section 1.4.2 and 6.2.3) and provided descriptions of certain company characteristics that were considered to affect the implications of the study. Hence, this may support practitioners to discern contextual factors and aid the study's *transferability* to other entities.

Furthermore, GDPR regulations have given the authors limited opportunities to share their material with full transparency. This may weaken the thesis *dependability*, as peer auditing and validating are based upon open access (Bell, Bryman et al. 2019). Consequently, it's been key for the authors to initially analyze data separately and attend all interviews together to avoid potential biases. Another key aspect to increase *dependability* has been to intensively seek input from academic third parties covered by the GDPR-agreements. Third-party validation, open dialogue, and constant reconciliation between each other were also key to not being influenced by personal values. In this way, the authors did their utmost to avoid acting in ways that could undermine the study's *confirmability* (Bell, Bryman et al. 2019).

## 4. EMPIRICS

The following section provides a thematic presentation of the empirical data which the authors have divided into three parts. (1) The introduction of remote work, (2) the social interactions, and (3) the perceived effects related to organizational culture. Altogether, this constitutes the foundation for analyzing how remote work affects knowledge creation.

### 4.1. Introducing remote work

#### 4.1.1. Increased autonomy on-site

Before the transition, employees express that factory workers were highly used to receive input from office workers regarding errors in the manufacturing line. With respect to the physical separation, however, factory workers now have a broader amount of work assignments which seem to encourage autonomy.

*“[...] Everything is hard in the beginning... especially when you're used to getting immediate answers, check-ups, and replies. But as the office workers were sent home, we've tried to raise the status of the factory workers so they can take greater responsibility. We want them to be able to make decisions without a confirmation for every little thing. Even though there is still a lot to be done, it feels like we're getting there.”*

- Eva

*“Since others work from home, I've gotten increased responsibility to keep the manufacturing rolling. I do a lot more things that I don't normally do such as ad-hoc problem-solving, phone calls, and Teams-meetings which enables me to learn more.”*

- Lisa

On the other hand, interviewees also describe an underlying dissatisfaction where factory workers experience a lack of support due to a difficulty in communicating complications e.g. errors via ICTs and longer waiting time.

*“When I call for help, I have to wait longer and when the person finally arrives it's often someone else. This means that I have to explain everything again and it just slows the whole process for us.”*

- Tim

*“I think that the factory workers are the ones left worse off. They can no longer display their problems in a simple way since someone ideally physically should be there to look at it.”*

- Maria

#### 4.1.2. Accelerated digitization processes

For employees that are physically separated, the organization has introduced ICTs for communication and work processes. Some employees say that they now gather much more information in *Microsoft Teams* which is described to facilitate accessing and sharing knowledge. Maria says: *“Previously, I could have my whole desk filled with notes [laughs] but now, I’ve learned to put it digitally and don’t think I’m the only one.”*

*“Now I try to digitize as much as possible. I’ve discovered that I don’t like having a lot of papers, so I always try to have a clean desk. If I have something on paper, I scan it so that I can access and share it to anyone from anywhere.”*

- Eva

In addition, several interviewees describe that working remotely has increased job productivity as it’s possible to have more meetings in less time, not least with external stakeholders.

*“Previously, it could take months to schedule a meeting with a customer due to ski trips, fully-booked schedules, someone getting sick, or similar. With Teams, it’s totally different. You reach out, you book a meeting, and you’re directly reaching the point. I must say, it’s so much more efficient!”*

- Eric

#### 4.1.3. Supporting pre-existing organizational culture

A factor that is said to aid the transition to remote work is the existing organizational culture among employees that knew each other from before. This is described to increase motivation and work as a guideline for both workers within the factory and home office. Daniel says: *“We’re still used to helping each other out and if we face a problem, we think ahead and solve it”*.

*“If you look at the employees at the company when the pandemic struck, I believe our core values have helped us. If you’re used to working according to them, you know that you have to do the little extra in order to make it work so that you and everyone else can have a good time.”*

- Kim

*“We’re growing and it feels like everyone’s in the same mindset. We push forward until we can’t go any further and then we develop and go again. [...] I think we’re still united even though I miss celebrating with the company.”*

- Eva

#### 4.1.4. Covid-19 and new cognitive frames

In addition, the circumstances brought by the pandemic seem to play a vital role since it’s described to bring further acceptance as well as trigger new knowledge visions among employees.



*“10 months ago, we changed our organization [to the new work arrangements] and undertook a developing journey that I think only has begun. I mean, something that would have taken three years has now taken less than one and everything moves incredibly fast.”*

- Sara

*“The pandemic has worked as a catalyst, pushing the way of thinking, ideas, and visions about the future but also created an acceptance to work like this which I believe would have been difficult to get in normal times.”*

- Eva

Many interviewees agree upon the initial acceptance among colleagues. However, some employees describe that this may only be a temporary state.

*“Now the factory workers understand that we should stay away due to Covid-19, everybody understands that. But I think a lot of people are expecting us to come back when the restrictions ease, which I think won’t happen.”*

- Eva again

## 4.2. Social interactions in the remote setting

*“You know... sometimes sitting at home almost makes me feel like I lose connection to the world somehow. You feel a little bit crazy after a while and then you have to drive to the factory and meet the others in order to get normal again!”*

- John

### 4.2.1. Disturbed communication dynamics

Interacting virtually is expressed as different from face-to-face interactions in several ways. To begin with, interviewees describe that they perceive a lower overall energy level, decreased ability to show personality, interpret nuances, and reading signals. In addition, participants express a difficulty in understanding if others are engaging actively or not listening. Martin says: *“It’s very hard to feel the energy of others virtually. I’ve met some people live but it’s almost like I don’t recognize them. It’s like nuances disappear on the flat screen.”*

*“[In video conferences] several people start at the same time, then stop and then you’re like “No, you go first” “No you..!” and you unintentionally just interrupt each other instead of having this relaxed conversation...”*

- Sara

*“Sometimes it feels like people are double-booking themselves... You see people setting up a meeting, connecting several colleagues, and then all of a sudden, the one inviting everyone is not appearing on the screen anymore. It’s almost like it’s too easy to multi-task.”*

- Eric

*“Sometimes I’m wondering whether they are actually listening or if they are just doing something else. It’s almost impossible to tell if a person is focused or bored via the screen.”*

- Martin

#### 4.2.2. Increased formality and perceived neutral space

Furthermore, all respondents emphasize that digital meetings are driven with a clearer purpose and a higher level of formality. John says: *“You wait for your turn to speak and there is no chit-chat between colleagues like in a conference room. It’s more clinical in a way, more efficient.”*

*“I believe the agendas and preparations for [digital] meetings are much more planned in advance. This makes us reach the point tremendously much faster. Before, I often felt like I was one step behind, but now, at least sometimes, I’m one step ahead.”*

- Eva

In addition, the perceived shift in communication dynamics due to working remotely seems to create a more neutral space for dialogues. Status related to position and charisma appears less visible making room for others to participate.

*“When we sit like this digitally, you don’t feel other people’s energy and you don’t notice if someone is authoritarian. In this [digital] setting, the focus is more narrowed down to solving the concrete task, which means that some employees may step forward while other people who usually are the loud ones, step back.”*

- Sara

#### 4.2.3. Less social gatherings

On the other hand, several interviewees describe that they miss informal social gatherings e.g., by the coffee machine. Together with being around each other, socializing is described as important for motivation, problem-solving ability, and getting the input needed in order to get their job done. However, being physically separated is described to build a barrier for accessing knowledge. Kim says: *“It feels like we’ve lost some of the happiness related to work since we don’t meet each other anymore, nor small-talk, and celebrate things”.*

*“Previously I could just throw a topic out there and get input directly but now, you don’t get those things “for free” anymore. You actively have to search for everything”.*

- Daniel

*“I think that one of the reasons why we are having more meetings now is that we have to discuss problems that previously were solved in the corridor, or with colleagues overhearing your discussion.”*

- John

*“All solutions aren’t developed in working hours but also in the lunchroom [...] I feel that this Teams-way of communicating over time may reduce these abilities, not to mention the motivation.”*

- Lisa

#### 4.2.4. Digital leadership attributes

Compared to conducting leadership face-to-face, several interviewees describe that transferring energy and understanding needs are more difficult. Meanwhile, leading remotely is described to demand more structure and formalization. This is shown through replacing understanding from physical interactions with formalized practices e.g. conducting weekly health-surveys instead of interpreting by behavior.

*“For me, leadership is to really “take a role” and I experience this so much easier face-to-face when you can get a sense of each other, feel each other’s energies, and are able to bring in a sense of humor - actually just being yourself. Doing this via the screen doesn’t feel as lively.”*

- Eva

*“At the office, you can tell by behavior and body language if a person is stressed and needs support, work relief, or just a coffee break. Virtually, however, this is so much harder as it’s difficult to feel the energy of others, see how people are, and what they might need. We’ve actually introduced a weekly survey that is sent out in order to try to mitigate these difficulties.”*

- Martin

*“I think it becomes key to communicate clearly and provide guidelines to your team members. This is something that we’ve tried to do [in the management team] but will be as important for group leaders in order to promote learning, and knowledge sharing.”*

- John

### 4.3. Challenges in fostering culture

#### 4.3.1. Team spirit and organizational culture

For the team spirit and building of trust, working remotely seems to impose challenges. Maria describes: *“The distance makes us lose the team spirit a bit... which on the other hand is normal when you’re used to being together”*. Daniel agrees: *“Everything gets so limited... it’s difficult to create a common understanding without meeting my colleagues”*.

*“When you’re on-site, you get more things “for free”. You greet, see how people are, get a feeling of the organization, and learn from others. Digitally, however, it’s much harder to navigate, especially if you’re new. I mean, it can be hard to even know who to turn to for support”*.

- Lisa

*“It feels more difficult to get a sense for the new employees. If they would’ve been on-site I probably would’ve chit-chatted with them in the factory, but now it’s just necessary if I need something specific from them. Building these relationships doesn’t seem to happen naturally now.”*

*- Daniel*

Many interviewees also express effects on motivation due to less “fun” and perceived injustices between colleagues imposed by the new work arrangement. Bob explains: “[...] *You sit in front of your computer, work, eat lunch alone, continue working, grab a cup of coffee, repeat... Not the fun we used to have...*”

*“I’m sure some people [in the factory] are jealous that they [remote workers] can stay at home. I mean, they can sleep longer, stay relaxed, and aren’t put at risk for the virus. There are some people who think that home-workers sometimes only pretend to work- I’ve heard that.”*

*- Tim*

#### 4.3.2. Commitment to share knowledge

For the longer term, interviewees describe a perceived barrier-like phenomenon that may pose threats involving the commitment to seek and share knowledge going forward.

*“It can be really disturbing if people call for every single thing via Teams. Personally, I always think twice before calling... You don’t want to be the one bothering and taking time from someone else you know...”*

*- Lisa*

*“Of course, you lose motivation when people don’t respond and you don’t know why. Are they busy, away from keyboard, or just ignoring? [...] Unfortunately, I think some factory workers have stopped presenting their ideas because they’ve felt that it isn’t leading anywhere. [...] I think it’s crucial to listen to us [factory workers] and follow up. I mean, there seems to be a lot going on, but it feels like this information isn’t reaching us anymore”.*

*- Tim*

## 5. ANALYSIS

The following section is based on the empirical data and seeks to answer the research question: *How is knowledge creation affected by working remotely?* Our findings imply that working remotely changes knowledge creation processes in several ways, particularly related to the *tacit* dimension and *socialization*. Therefore, this section is divided into three parts shedding light on knowledge effects related to the immediate changes, thereafter perceived social interactions, followed by a forward-looking perspective.

### 5.1. Immediate effects on knowledge creation

Through revisiting the theoretical lens, Nonaka et. al (2000) explains that knowledge creation consists of primary four elements - *internalization*, *combination*, *externalization*, and *socialization*. Altogether, the conversion modes dynamically constitute the process of creating knowledge and when practiced, the spiral of knowledge broadens.

#### 5.1.1. Internalization, externalization, combination

In terms of *internalization*, the *explicit-to-tacit* dimension, empirics display contradictory effects due to introducing remote. As remote workers cannot partake in on-site processes through action and practice it seems to constraint their ability to provide support. Moving the office workers away hence changes the expectations on on-site workers to engage in more intense problem solving autonomously. Nonaka et al. (2000) says autonomy increases the chances to motivate organization members to create new knowledge through experimenting hence improving “*learning-by-doing-capabilities*”. Although this corresponds to the perceived immediate effect, the expressed lack of support is bearing a risk, both in terms of creating a barrier between the departments as well as spurring demotivation. This is further analyzed in section 5.3.2.

In regard to the *externalization* and *combination* dimension, empirics display positive impacts due to working remotely. Several interviewees expressed that the introduction of ICTs seem to provide more structure to the daily activities by facilitating the storage and sharing of knowledge. For the *externalization* factor, i.e., the conversion of *tacit-to-explicit* knowledge, this means that *tacit* knowledge to a larger extent is articulated explicitly which facilitates the opportunity to make it available for the rest of the organization (Nonaka, Ikujiro 1994). Consequently, the *combination* factor, i.e., the transfer of *explicit-to-explicit* knowledge, seems to increase as synthesis from databases and processing of information from relevant stakeholders via chat or call are perceived more accessible. Ultimately, employees in the remote setting seem encouraged to articulate knowledge leading the creation process to consist of more *explicit* knowledge.

#### 5.1.2. Shared space for knowledge creation

For knowledge creation to occur, Nonaka et al. (2000) emphasize the physical, virtual, or mental *shared space* in which knowledge can be created. Several factors may help moderate and energize such space and therein lie *knowledge assets* and conditions such

as *creative chaos*. This theoretical lens helps understand the perceived stimulation of new knowledge visions caused by the pandemic. Being forced to reconsider the company's business was expressed as an eye-opener and catalyst for new visions to thrive. This experience of breaking down routines and cognitive frameworks seem to provide new perspectives which have made them fundamentally reorganize the way they work today, and perhaps in the future. Theory indicates that this way of finding the right guidelines and work processes through fundamentally reconsidering existing premises caused by *chaos* energizes the SECI-process which corresponds to the empirical findings of e.g., facilitated adoption and learning.

In addition, empirics display that the organizational culture with characteristics such as supportiveness, trust, and know-how in routines seems to play a vital role in providing the necessary inputs for employees to adapt to the transition. For remote workers, team spirit is expressed to encourage overcoming challenges. For factory workers, organizational norms provide expectations “*to do the little extra*” and are described to bring acceptance for the new work arrangement. In regard to the theoretical lens, this could be understood as *tacit knowledge assets* moderating the SECI-process. Collins (2020b) further nuance the understanding of how these *assets* are derived from previous successful *IRs* on-site that seem to have resulted in the positive long-term effects due to *collective effervescence*. This state leads to feelings of *group solidarity* and *morality*. Indeed, empirics show that previous interactions anchored in *knowledge assets* are proven important for knowledge creation when working remotely. However, the long-lasting effects of previous successful *IRs* appear to fade with time. This puts the focus on the *socialization* factor and whether remote work allows for such activities to occur.

### Sub-conclusion

The immediate effects leverage pre-existing *knowledge assets* and new cognitive frames generated by reconsideration of the business to moderate and energize the *shared space* where learning and knowledge creation can take place. For organizational knowledge, working remotely is perceived to promote the conversion of *tacit* knowledge into *explicit*. On one hand, this promotes learning and facilitates the opportunity to convert knowledge to an organizational level. On the other hand, working remotely seems to impose threats to the *tacit* dimension of knowledge and *socialization*.

## 5.2. Effects due to new interaction dynamics

### 5.2.1. Socialization

Socialization plays a vital dimension in fostering organizational knowledge (Nonaka 1994). However, the remote work setting seems to reduce the necessary mechanisms that enable such activities. Interviewees experience that ICTs don't let people seamlessly interact, social encounters are expressed as less lively and authentic, while not encouraging small talk. Through the lens of the theoretical frame, empirics point out that the ingredients that ideally should go into a successful *IR* to yield the effects of *collective effervescence* are less prevalent. In regard to *co-presence*, several interviewees describe difficulty in interpreting nuances and reading signals. Moreover, interviewees express

that colleagues are less focused in virtual meetings hence reducing the perceived *mutual focus of attention*. Additionally, it's said that communicating emotions such as joy and engagement digitally is perceived as difficult making it harder to attain the state of *shared mood*. Last, participants in virtual conferences often interrupt each other which seems to lead to more misunderstandings and insecurity indicating a reduced ability to reach *rhythmic entrainment*.

Ultimately, this indicates that successful *IRs* might not be as obtainable in the remote setting as these are based on *rhythm* and *energy build-up* that in turn creates the understanding of each other that yields *confidence*, *solidarity*, *morale*, and *emotional energy* (Collins, 2014). Although this theoretically should leave negative impacts on the SECI-process due to reduced *socialization*, several themes emerge from the empirics that display both positive and negative effects.

#### 5.2.2. Positive effects due to less socialization

First, empirics display that meetings are perceived as more purpose-driven and efficient when working remotely. This, as less time is spent on talking outside the agenda, asking about daily mood, and "*chit-chatting*" i.e., corresponding to a reduced level of *socialization*. Because some employees experience an increased risk of losing the attention of participants, raising the level of formality could be an attempt to promote the ideal state of *mutual focus of attention*. This shift in making meetings stricter seems to encourage individual preparation in advance, hence reaching faster decision-making. As a result, increasing processing and synthesis of knowledge. Consequently, replacing previous stimulation of *tacit* knowledge e.g., social bonding to further promote *explicit* knowledge elements.

Secondly, interacting digitally seems to create a more neutral space for dialogues as interviewees describe that characteristics such as authoritarian and charismatic are less visible. These new perceived premises for communication appear to make some employees step back, while others step forward. As a result, *charisma*, *energy*, and *personality* are shown to play less of a role in determining who takes place in conversations. Instead, leaving room for the ones who are most likely to contribute to the specific solution to interact. On one hand, interviewees express that this leads to more rich discussions promoting knowledge creation where employees dedicated to solving the specific task thrive. On the other hand, there are indications that these streamlined work environments could drain the organization as employees generating energy is said to be important for promoting team-spirit, commitment, and in turn knowledge (mostly *tacit*). This risk is further discussed in section 5.3.1.

#### 5.2.3. Negative effects due to less socialization

On the negative side, the lack of the *socialization* component is reflected in not receiving valuable information through spontaneous meetings e.g., by the coffee machine. This corresponds to how Nonaka et al. (2000) describe that informal social gatherings promote sharing and creating *tacit* knowledge. In the remote setting, however, physical contact is limited, and empirics express that informal conversation rarely occurs via ICTs as they aren't perceived as a natural way for building relationships. Interviewees describe this to

constrain the problem-solving ability as well as create a barrier for employees to engage, share, and ask for information that is needed in order to get their job done. Hence, hinder the conversion of knowledge, as well as have alarming effects on *emotional energy* among employees.

Furthermore, *energy* constitutes an important ingredient for charismatic leaders (Conger, Kanungo, 1994). Because employees express a perceived lower energy level virtually, this helps to understand the complexity in leading knowledge visions remotely. Since attributes such as energy, engagement, and confidence are perceived as harder to express digitally, charismatic leadership as a tool for exerting power is perceived as limited. Hence, employees describe an adoption of implementing more structure and formalization in leadership. In regard to knowledge creation, leaders consequently encourage the transition to more *explicit* knowledge as their previous charismatic strategies to promote knowledge don't seem to receive the same effect virtually. Hence, perceiving a decreased ability to encourage *tacit* knowledge assets and lead *socialization* remotely.

## Sub-conclusion

As working remotely is shown to reduce *socialization* and introduce new communication dynamics, it seems to change the premises where employees share, create, and transfer knowledge. On the positive side, meetings tend to be more efficient with rich discussions on a neutral space more focused on solving the specific task. Negatively, however, the lack of socialization seems to build a barrier for accessing knowledge. In addition, a perceived difficulty in generating energy and charisma has led leaders to further encourage *explicit* knowledge at the cost of *tacit* knowledge. Indeed, working remotely is shown to affect knowledge creation through the theoretical lens (see figure 5.1).

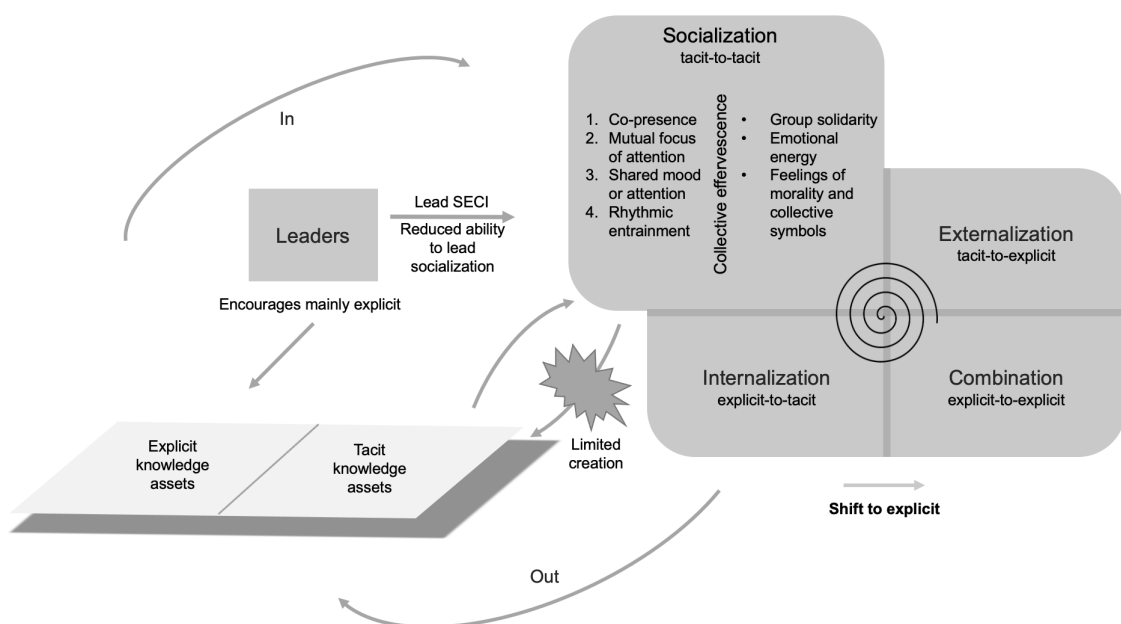


Figure 5.1: Remote work effect on Combined knowledge framework by Holmberg Silwén (2021), inspired by Nonaka et al. (2000)



## 5.3. A forward-looking perspective

### 5.3.1. Organizational culture

Even though interviewees describe the culture as still guiding employees, the creation of new *tacit knowledge assets* is shown to be limited. When employees no longer physically meet nor allow themselves to actively socialize, the *shared understanding* including organizational culture, sense of belongingness, and commitment are expressed to decrease. In regard to the theory, empirics confirm that the effects of previous successful *IRs* anchored in *tacit knowledge assets* aren't static and play an important role for knowledge to be created. Drawn from empirical indications, maintaining the positive effects of *collective effervescence* may become even more challenging if negative emotions escalate and new employment occurs, as this seems to dilute culture. Although ICTs provide the opportunity to share knowledge, the *tacit* dimension related to motivation and drive to engage in knowledge sharing appears to be negatively affected in the longer term. This imposes challenges, particularly in regard to the hybrid work arrangement (shown in Appendix 7.3).

### 5.3.2. Knowledge fragmentation

For remote workers, it's now said that more motivation is needed in order to engage in the knowledge spiral since a perceived barrier has occurred due to working remotely. Furthermore, factory workers express a similar phenomenon in the communication with remote colleagues but in addition to that, they also express an underlying dissatisfaction. This is shown in the perceived lack of response, increased complexity for solving the same tasks as before, and injustice related to being put at risk of infection. For the conversion of knowledge, this barrier and underlying negativity impose risks in the longer term. First, the barrier seems to leave employees (particularly new) unaware of available knowledge support. Secondly, employees describe that they actively don't ask for help when needed due to a perceived risk of being considered as tiresome. Thirdly, a reduced commitment and sense of belongingness seem to demotivate employees to actively engage and promote the knowledge creation spiral. All of which together impose risks for uneven division of information displayed as a knowledge fragmentation particularly critical between on-site and remote workers. For the knowledge creation process, potential groupings developing in different directions may divide the ideal unified knowledge spiral into separate ones in different parts of the organization. However, Nonaka et al. (2000) argue that knowledge needs to be dynamically shared for it to provide its full potential.

### Sub-conclusion

The reduced *socialization* factor appears to create a chain reaction, ultimately capitalizing on *tacit knowledge assets* embedded in the firm e.g., organizational culture. In the longer term, risks are identified in knowledge being isolated to certain parts of the organization, both unintentionally (in the absence of guidance and support) but also intentionally (due to lack of commitment and motivation). Hence, knowledge fragmentation constitutes a threat to organizational knowledge creation and the ability to create and sustain a competitive advantage.

## 6. DISCUSSION

### 6.1. Answer to the research question

#### *How is knowledge creation affected by working remotely?*

This study shows the necessity to maintain employee relationships when working remotely to foster knowledge creation. However, findings show that knowledge tends to be narrowed down to an *explicit* form hence reducing *socialization* among employees. For the immediate effects of introducing remote work, knowledge creation processes are perceived to accelerate. The underlying reasons for this seem to be found in previous physical interactions embedded in *tacit knowledge assets* e.g., organizational culture together with stimulating conditions such as new digital tools and cognitive frames. For the longer term, however, the lack of *tacit* knowledge conversion is shown to have alarming effects on organizational knowledge creation as the setting doesn't provide the necessary mechanisms related to social interactions promoting commitment, engagement, and culture. If not acted upon, findings display that this may lead to knowledge fragmentation hence affecting knowledge creation processes negatively.

### 6.2. Contributions of the study

#### 6.2.1. Theoretical contribution

Through elaborating on existing theory, the authors provide a new lens to investigate the identified research gap. This study especially sheds light on the micro-sociological interactions constituting primarily *tacit* knowledge creation where *socialization* plays a vital role (Nonaka, Ikujiro 1994). Although the importance of socialization is widely established among scholars (Vaccaro, Veloso et al. 2009, Farnese, Barbieri et al. 2019), the implication of this study provides interesting considerations regarding its relation to knowledge. This, as implications, display both positive and negative effects due to less *socialization*. Consequently, raising questions regarding whether there may exist tipping-points where *socialization* instead capitalize on other *explicit* knowledge creation processes hence negatively affecting knowledge creation.

Although the division of conversion modes isn't explicitly discussed by Nonaka et al. (1994, 1998, 2000), the implications of this study however display a relative shift in the utilization of *tacit* knowledge combined with the encouragement of articulating knowledge explicitly. This finding agrees with scholars arguing that *explicit* knowledge is facilitated in remote work (e.g., Zack, 1999), but contradicts Vaccaro's (2009) findings arguing that *tacit* knowledge is enhanced remotely. Hence, providing a ground for future research to investigate more detailed understandings within the field.

### 6.2.2. Managerial implications

The findings of this study imply that introducing remote work is posing challenges for knowledge creation processes. Tying back to the barrier to share knowledge, the authors, therefore, propose activities that may prevent knowledge fragmentation when working remotely.

Firstly, our findings show that working remotely may demotivate knowledge-sharing. Hence, the authors encourage strategies for facilitating *corporate communication* e.g., establishing channels for knowledge support, promoting communities for practice, providing expectations on what knowledge to share with others, and fostering inclusive knowledge-sharing norms. Secondly, the authors emphasize the importance to *promote trust-building* relationships which may be enhanced by *managing some activities on-site* while others remotely. As findings point out that working remotely is insufficient in building relationships and commitment, activities such as team-based training, brainstorming, collective lunches, and social events that encourage different parts of the organization to socialize may preferably be held physically. Remotely, however, activities related to stimulating the *explicit* dimension may be conducted e.g., processing of information, routine tasks, and some of the external client meetings. Based upon this, organizations may then foster efficient stimulation of *explicit* knowledge remotely, while developing organizational *socialization* through primarily physical interactions. Hence, guiding practitioners to promote organizational knowledge.

### 6.3. Study limitations

Regarding the situation-specific factors introduced in section 1.4.2, it's shown that the abnormal circumstances in which this case study was conducted are important to consider when validating the applicability of the implications of this study. Future researchers and policymakers hence must consider the factors; (1) temporary work arrangement, (2) risk of infection, (3) everyday quality of life, and (4) the sense of "chaos". All together constituting potential limitations in the implications of this study. Furthermore, the study was conducted through a qualitative case study based on an interpretive view. The presentation of the empirical data hence leaves room for a subjective view of the organization which may encourage further research to increase transferability.

### 6.4. Future research

In order to test the results of this qualitative study, the authors encourage similar in-depth research in different organizations as well as conducting quantitative secondary studies within the field. Furthermore, the results and implications of this study crystallize several interesting future research fields. To begin with, the authors suggest further research in the field of the ideal leadership attributes for promoting knowledge creation within remotely working teams. Secondly, investigating the potential of more advanced ICTs in relation to knowledge may be of interest. This, as they may bring more authentic face-to-face interactions hence potentially affecting the ability to promote the transfer of *tacit* knowledge. Lastly, the authors encourage to investigate whether there may be an ideal level of social bonding contributing to knowledge creation processes in remote settings.

All of which together constitute further interesting implications for practitioners standing at the cross-road whether to go back to on-site work, introduce flexible work arrangements, or go fully remote.

## 7. APPENDIX

### 7.1. Official interview guide

#### **Introduction** (not recorded):

- Presentation of authors
- Presentation of essay and its general purpose
- Presentation of formal information around participation:
  - Participation is voluntary
  - You have the right to cancel the interview at any time without explaining why
  - The company, interviewee name, and the role will be anonymized
  - Ask for approval to record the interview to later transcribe it excluding any personal data.
  - Any questions before we begin?

#### **Background:**

- How would you describe your role at the company?
- How long have you worked at the company?
- What does a normal working day look like for you today? What did it look like before?
- How much freedom do you have to develop your tasks and responsibilities in your daily work? (autonomy-check)
- How much do you need to collaborate with others to get your job done? If so, with whom?
- How do you think the collaboration is working remotely?
- What channels and/or digital tools do you use when you communicate today?
- How do you perceive your knowledge creation to be affected by working remotely?

#### **Socialization:**

- How would you describe the atmosphere and culture of the company?
- How do you build trust and confidence in your colleagues in the digital format?
- How do you feel that spontaneous interaction is expressed in the digital format?
- How would you assess the quality of communication in the physical and digital formats, respectively?
- How do you feel that your ability to understand stakeholders (e.g., suppliers and customers) has been affected by the digital format?
- Do you experience any particular differences related to energy level between physical and digital meetings?
- How do you perceive this to affect your learning and knowledge?

#### **Externalization:**

- For example, if you have an idea for an area for improvement, how do you go about promoting it and getting it through?
- To what extent would you say that you speak up and present your ideas today compared to the previous physical work climate?

**Combination:**

- How do you make sure that everyone in the project team has ongoing access to the information they need to complete a project?
- What do you report in your daily work and has this changed due to working remotely?
- How does the “teams folder” with all the documents help you get your work done?
- How do you think it works?

**Internalization:**

- How has working remotely affected your ability to learn-by-doing?
- Have your every-day tasks changed? If so, how?
- Has the availability to take part in work training been affected by homework?
- If you have taken part in work training, in what way have you benefited from it?

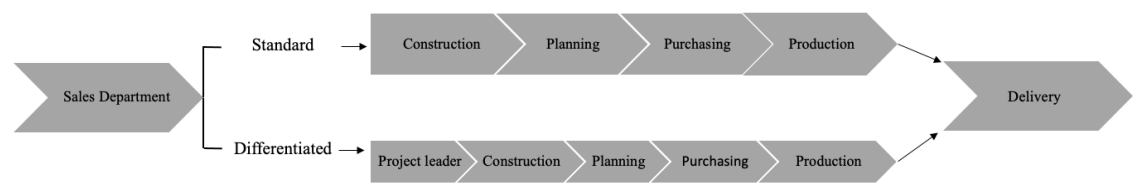
**Concluding questions:**

- When you sit at home, how do you feel that the outcome of your work has been affected in terms of finding solutions for tasks?
- How would you describe the potential risk or short-comings with working remotely?
- What has been important to you in your leadership/project management/work to make it possible in this context?
- What do you think most people experience as the biggest challenges of working from home?
- What are the biggest benefits of working from home?
- What is important for yourself to continue to develop in the future?
- What do you think is most important for the company to continue to develop in the future?
- Are there any specific tasks you perform today that you consider to be based on processes that were initiated before the transition to remote work? If yes, please elaborate.
- Do you think that working remotely is sustainable in the long run?
- How has the ability to develop, learn, and be innovative been affected by the change?
- Is there something you would like to add?

**Finish:**

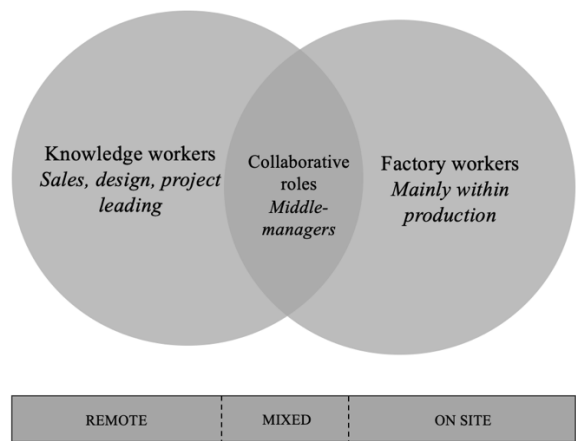
- Ask if we can contact the interviewee for further questions via email if necessary
- Inform about the access to the finalized script and assignment
- Thank you very much for your participation!

# 7.2. Workflow scheme



Appendix figure 7.2: Workflow scheme case company

# 7.3. Division of workers



Appendix figure 7.3: Illustration of worker division at the case company

## 8. LIST OF WORKS CITED

### 8.1. Academic journals and literature

ALAVI, M. and TIWANA, A., 2002. Knowledge integration in virtual teams: The potential role of KMS. *Journal of the American Society for Information Science and Technology*, 53(12), pp. 1029-1037.

ALVESSON, M. and KÄRREMAN, D., 2007. Constructing mystery: Empirical matters in theory development. *Academy of management review*, 32(4), pp. 1265-1281.

ALVESSON, M. and KÄRREMAN, D., 2001. Odd couple: making sense of the curious concept of knowledge management. *Journal of management studies*, 38(7), pp. 995-1018.

ANTONELLI, C., GEUNA, A. and STEINMUELLER, W., 2000. Information and communication technologies and the production, distribution and use of knowledge. *International Journal of Technology Management*, 20, pp. 72–94.

ASPREY, L., 1949-, 2003. Integrative document and content management : strategies for exploiting enterprise knowledge / Len Asprey and Michael Middleton. Hershey PA: Idea Group Pub.

BECKER, M.C., SALVATORE, P. and ZIRPOLI, F., 2005. The impact of virtual simulation tools on problem-solving and new product development organization. *Research policy*, 34(9), pp. 1305-1321.

BELL, E., BRYMAN, A. and HARLEY, B., 2019. Business research methods. Fifth edition edn. Oxford: Oxford University Press.

BENTO, J., DUARTE, J.P., HEITOR, M.V. and MITCHELL, W.J., 2004. Collaborative design and learning: Competence building for innovation. Greenwood Publishing Group.

BLOOM, N., LIANG, J., ROBERTS, J. and YING, Z.J., 2015. Does Working from Home Work? Evidence from a Chinese Experiment \*. *The Quarterly Journal of Economics*, 130(1), pp. 165-218.

CAIRNEY, P., 2013. Standing on the Shoulders of Giants: How Do We Combine the Insights of Multiple Theories in Public Policy Studies? *Policy Studies Journal*, 41(1), pp. 1-21.

CARROLL, N. and CONBOY, K., 2020. Normalising the “new normal”: Changing tech-driven work practices under pandemic time pressure. *International Journal of Information Management*, 55, pp. 102186.



CHOUDHURY, P., 2020. Our Work-from-Anywhere Future. (cover story). *Harvard business review*, 98(6), pp. 58-67.

COLLINS, M., 2005. The (not so simple) case for teleworking: a study at Lloyd's of London. *New Technology, Work and Employment*, 20(2), pp. 115-132.

COLLINS, R., 2020a. *Charisma: Micro-sociology of Power and Influence*. Taylor & Francis.

COLLINS, R., 2020b. Social distancing as a critical test of the micro-sociology of solidarity. *American Journal of Cultural Sociology*, 8(3), pp. 477-497.

COLLINS, R., 2014-last update, *Interaction ritual chains*. [Homepage of Princeton University Press], [Online]. Available: <https://doi.org/10.1515/9781400851744>.

CONGER, J.A. and KANUNGO, R.N., 1994. Charismatic Leadership in Organizations: Perceived Behavioral Attributes and Their Measurement. *Journal of Organizational Behavior*, 15(5), pp. 439-452.

COWAN, R., DAVID, P. and FORAY, D., 1999. The Explicit Economics of Knowledge Codification and Tacitness. *Industrial and Corporate Change*, 9.

DÁVIDEKOVÁ, M. and HVORECKÝ, J., 2017. ICT Collaboration Tools for Virtual Teams in Terms of the SECI Model. *International Journal of Engineering Pedagogy* ISSN: 2192-4880, 7, pp. 95-116.

DIENER, E. and CRANDALL, R., 1978. *Ethics in social and behavioral research*. U Chicago Press.

FARNESE, M.L., BARBIERI, B., CHIRUMBOLO, A. and PATRIOTTA, G., 2019. Managing Knowledge in Organizations: A Nonaka's SECI Model Operationalization. *Frontiers in psychology*, 10, pp. 2730.

FRANKL, V.E., 2011. *Man's search for ultimate meaning*. New ed. edn. London: Rider.

GOURLAY, S., 2006. Conceptualizing knowledge creation: A critique of Nonaka's theory. *Journal of Management Studies*, 43(7), pp. 1415-1436.

GRANT, R.M., 1996. Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17(SUPPL. WINTER), pp. 109-122.

GRIFFITH, T.L., SAWYER, J.E. and NEALE, M.A., 2003. Virtualness and Knowledge in Teams: Managing the Love Triangle of Organizations, Individuals, and Information Technology. *MIS Quarterly*, 27(2), pp. 265-287.

HENDERSON, K., 1998. On line and on paper: Visual representations, visual culture, and computer graphics in design engineering. MIT press.

IVERSON, R.D. and MAGUIRE, C., 2000. The relationship between job and life satisfaction: Evidence from a remote mining community. *Human Relations*, 53(6), pp. 807-839.

JENSEN, M.B., JOHNSON, B., LORENZ, E. and LUNDVALL, B.A., 2007. Forms of knowledge and modes of innovation. *Research Policy*, 36(5), pp. 680-693.

KAUSHIK, M. and GULERIA, N., 2020. The impact of pandemic COVID-19 in workplace. *European Journal of Business and Management*, 12(15), pp. 1-10.

KELLIHER, C. and ANDERSON, D., 2010. Doing more with less? Flexible working practices and the intensification of work. *Human Relations*, 63(1), pp. 83-106.

KOGUT, B. and ZANDER, U., 2009. Knowledge of the firm. Combinative capabilities, and the replication of technology. *Knowledge in Organisations*. pp. 17-36.

KOMINERS, S. and GONZALEZ, G., 2020. Zoom video communications and COVID-19. Harvard Business School Case 820, 108.

LAMBERT, A.D., MARLER, J.H. and GUEUTAL, H.G., 2008. Individual differences: Factors affecting employee utilization of flexible work arrangements. *Journal of vocational behavior*, 73(1), pp. 107-117.

LEE, T.W., MITCHELL, T.R. and SABLINSKI, C.J., 1999. Qualitative research in organizational and vocational psychology, 1979–1999. *Journal of vocational behavior*, 55(2), pp. 161-187.

MACHLUP, F., 1983. Semantic quirks in studies of information. *The Study of Information: Interdisciplinary Messages*, , pp. 641-671.

MORGANSON, V.J., MAJOR, D.A., OBORN, K.L., VERIVE, J.M. and HEELAN, M.P., 2010. Comparing telework locations and traditional work arrangements: Differences in work-life balance support, job satisfaction, and inclusion. *Journal of Managerial Psychology*, 25(6), pp. 578-595.

NONAKA, I. and KONNO, N., 1998. The concept of "Ba": Building a foundation for knowledge creation. *California management review*, (3), pp. 40-54.

NONAKA, I., 1994. A Dynamic Theory of Organizational Knowledge Creation. *Organization Science*, 5(1), pp. 14-37.

NONAKA, I., TOYAMA, R. and KONNO, N., 2000. SECI, Ba and Leadership: a Unified Model of Dynamic Knowledge Creation. *Long range planning*, 33(1), pp. 5-34.

RICHTER, L., 2011. A critique of Nonaka's SECI model. University of Zilina, Faculty of Management Science, Faculty of Management Science and Informatics, Department of Management Theories,, Slovakia, .

ROSEN, B., FURST, S. and BLACKBURN, R., 2007. Overcoming Barriers to Knowledge Sharing in Virtual Teams. *Organizational dynamics*, 36(3), pp. 259-273.

SANTOS, F.M., 2003. The role of information technologies for knowledge management in firms. *International Journal of Technology, Policy and Management*, 3(2), pp. 194-203.

SCHWANDT, T.A., LINCOLN, Y.S. and GUBA, E.G., 2007. Judging interpretations: But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Evaluation*, 2007(114), pp. 11-25.

SCHWERTNER, K., 2017. Digital transformation of business. *Trakia Journal of Sciences*, 15(1), pp. 388-393.

SEWELL, G. and TASKIN, L., 2015. Out of Sight, Out of Mind in a New World of Work? Autonomy, Control, and Spatiotemporal Scaling in Telework. *Organization Studies*, 36(11), pp. 1507-1529.

SHANNON, P. and HAMBACHER, E., 2014. Authenticity in Constructivist Inquiry: Assessing an Elusive Construct. *Qualitative Report*, 19(52),.

SPENDER, J.-., 1996. Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, 17(SUPPL. WINTER), pp. 45-62.

STASSER, G., VAUGHAN, S.I. and STEWART, D.D., 2000. Pooling unshared information: The benefits of knowing how access to information is distributed among group members. *Organizational behavior and human decision processes*, 82(1), pp. 102-116.

SUH, A. and LEE, J., 2017. Understanding teleworkers' technostress and its influence on job satisfaction. *Internet Research*, 27(1), pp. 140-159.

THOMAS, J.B., SUSSMAN, S.W. and HENDERSON, J.C., 2001. Understanding “Strategic Learning”: Linking Organizational Learning, Knowledge Management, and Sensemaking. *Organization Science*, 12(3), pp. 331-345.

VACCARO, A., VELOSO, F. and BRUSONI, S., 2009. The impact of virtual technologies on knowledge-based processes: An empirical study. *Research Policy*, 38(8), pp. 1278-1287.

VAUGHAN, D., 1992. Theory elaboration: The heuristics of case analysis. What is a case, 173202.

WAIZENEGGER, L., MCKENNA, B., CAI, W. and BENDZ, T., 2020. An affordance perspective of team collaboration and enforced working from home during COVID-19. null, 29(4), pp. 429-442.

YIN, R.K., 2013. *Case Study Research: Design and Methods*. SAGE Publications.

ZACK, M.H., 1999. Managing codified knowledge. *Sloan management review*, 40(4), pp. 45-58.

## 8.2. Digital sources

Baker, M (2020), *Gartner Survey Reveals 82% of Company Leaders Plan to Allow Employees to Work Remotely Some of the Time*, Gartner Newsroom 2020, viewed 2021-02-10  
<<https://www.gartner.com/en/newsroom/press-releases/2020-07-14-gartner-survey-reveals-82-percent-of-company-leaders-plan-to-allow-employees-to-work-remotely-some-of-the-time>>

Boston Consulting Group 2021, *New ways of working smart*, Boston Consulting Group, viewed 2021-05-02  
<<https://web-assets.bcg.com/6e/e0/a72d6d424c77a9248fd648abc6e7/smart-work-publication-2021.pdf>>

Cambridge Business English Dictionary n.d., *Knowledge worker*, Cambridge University Press, viewed 2021-05-08 <<https://dictionary.cambridge.org/us/dictionary/english/knowledge-worker>>

Folkhälsomyndigheten 2021. *The Public Health Agency of Sweden's regulations and general guidelines relating to everyone's responsibility to prevent COVID-19 infections*  
Folkhälsomyndigheten, viewed 2021-04-01 <<https://www.folkhalsomyndigheten.se/the-public-health-agency-of-sweden/communicable-disease-control/covid-19/regulations-and-general-guidelines/>>

Gartner Glossary n.d., *Digitization*, Gartner, viewed 2021-04-25  
<<https://www.gartner.com/en/information-technology/glossary/digitization>>

IGI global n.d. *What is Knowledge Fragmentation*, IGI global Publisher of timely knowledge viewed 2021-05-10 <<https://www.igi-global.com/dictionary/role-collaboration-systems-knowledge-management/16346>>

Lund, Madgavkar et. al 2021, *What's next for remote work: An analysis of 2,000 tasks, 800 jobs, and nine countries*, McKinsey Global Institute, viewed 2021-05-02 <<https://www.mckinsey.com/featured-insights/future-of-work/whats-next-for-remote-work-an-analysis-of-2000-tasks-800-jobs-and-nine-countries>>

O'Dwyer 2021, *PwC tells staff to split office and homeworking after Covid*, Financial Times, viewed 2021-05-02 <<https://www.ft.com/content/0e04e5a4-fce6-4007-b032-befde6895a43>>