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LATE TECHNOLOGY ADOPTERS AND REMOTE WORK – CASE COVID-19

Master's Thesis
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Abstract of master's thesis

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Abstract

Technology and digitalization have significantly changed the way people work, especially in the past few years. Due to new communication technologies, remote work has become more available and prevalent. In 2020, the COVID-19 pandemic hit the world and forced a significant part of the workforce to start working from home, whether they wanted to do it or not. The situation provided an unprecedented opportunity to examine how late technology adopters, who may not have been ready for the shift, adapted to the situation and adopted the daily use of communication technologies.

The aim of this study was to examine three aspects of late adopters and technology during the COVID-19 pandemic. The first aspect was how late technology adopters had adapted to the enforced remote work and the use of remote work technologies during the pandemic, the second was whether the enforced remote work changed their views on the remote work communication technologies, and the third was how the employers' actions affected the adaptation.

The foundation of the theoretical research was the Diffusion of Innovations theory (DOI), accompanied by research and theories on remote work and communication technologies at workplaces. The empirical research consisted of semi-structured interviews with late technology adopters who had been forced to work remotely due to the COVID-19 pandemic.

The study contributes to the research on remote work, communication technology and DOI by examining a situation where technology adoption is forced and abrupt from the viewpoint of late adopters and by providing insights on how such a situation can be navigated in order to make the shift more successful for late adopters. The results of the study indicate that late adopters adapt to remote work and using remote work technologies relatively well but do not get fully comfortable with the situation even after a few months of working remotely, and that the support from employers and managers is especially important for late adopters.

Keywords Diffusion of Innovations, remote work, COVID-19, ICT, technology adoption, telecommuting, late technology adopters, laggards

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Tiivistelmä

Teknologia ja digitalisaatio ovat muuttaneet työympäristöä ja työskentelytapoja merkittävästi. Uudet kommunikaatioteknologiat ovat mahdollistaneet etätyön, joka on yleistynyt viime vuosina. Vuonna 2020 COVID-19-pandemia ja siihen liittyvät rajoitukset pakottivat merkittävän osan työväestöstä kotiin etätöihin. Tilanne mahdollisti täysin uuden ja uniikin tilaisuuden tutkia, kuinka teknologioiden hitaat omaksujat, jotka eivät välttämättä olleet valmiita siirtymään etätöihin, omaksuivat tilanteen ja kommunikaatioteknologioiden päivittäisen käytön.

Tutkimuksen tavoitteena oli tutkia hitaita teknologioiden omaksujia ja heidän omaksumisprosessiaan koronaviruspandemian aikana kolmesta eri näkökulmasta. Ensimmäisenä tavoitteena oli tutkia, kuinka hitaat omaksujat sopeutuivat pakotettuun etätöiden tekemiseen ja etätyöteknologioiden käyttöön. Toisena tavoitteena oli tutkia, muuttuivatko hitaiden omaksujien mielipiteet heidän käyttämistään etätyöteknologioista pandemian aikana. Kolmantena tavoitteena oli tutkia, kuinka työnantajien toimet vaikuttivat omaksumis- ja sopeutumisprosessiin.

Tutkimuksen teoreettisena pohjana oli innovaatioiden diffuusioteoria (Diffusion of Innovations, DOI) sekä etätöihin ja kommunikaatioteknologioiden käyttöön liittyviä tutkimuksia ja teorioita. Empiirinen tutkimus koostui puolistrukturoiduista haastatteluista, joissa haastateltiin hitaita teknologioiden omaksujia, jotka olivat joutuneet etätöihin koronaviruspandemian vuoksi.

Tutkielma edesauttaa etätöiden, innovaatiodiffuusion ja kommunikaatioteknologioiden tutkimusta tarkastelemalla uniikkia tilannetta hitaiden teknologioiden omaksujien kannalta, ja tarjoaa näkökulmia siihen, kuinka pandemian kaltaisen yllättävän tilanteen aikana etätöitä ja teknologioiden käyttöönottoa voidaan helpottaa hitaille omaksujille. Tutkielman tulokset osoittavat, että hitaat omaksujat sopeutuvat suhteellisen hyvin etätöihin ja etätyöteknologioihin pakon edessä mutta eivät usean kuukaudenkaan jälkeen totu siihen täysin ja että työnantajan ja esihenkilöiden tuki on hitaille omaksujille erityisen tärkeää.

Avainsanat Etätyö, innovaatioiden diffuusio, COVID-19-pandemia, ICT, kommunikaatioteknologia, teknologioiden omaksuminen, hitaat teknologioiden omaksujat

Table of Contents

List of Tables

List of Figures

1 Introduction

1.1 Motivation and Background

The year 2020 was exceptional due to the Covid-19 pandemic. The pandemic, which resulted in different levels of lockdowns and restrictions, also had an effect on the workforce. Employees whose job allowed remote work were often forced to stay home and use remote work technologies, including different video and audio communication tools and platforms. This shift was warmly welcomed by some but less welcomed by others. Based on the Diffusion of Innovation (DOI) theory, developed by Rogers (1962), innovations are adopted differently by different parts of the population. The five categories, beginning with Innovators who are the first to try innovations even when using the innovation is still risky, and ending with Laggards who are the last ones to try out new innovations due to their conservatism and scepticism, describe how the population is divided based on their quickness to adopt new innovations. While Innovators, Early Adopters, Early Majority and perhaps even parts of the Late Majority have already been using the remote work communication technologies used during the pandemic regularly, or at least without much opposition, Laggards may have still resisted the relatively new technologies and preferred more traditional methods. However, the pandemic and its restrictions have partly forced some Laggards and other late adopters to finally start using these technologies on a daily basis. The setting is quite unique as the shift has been quite universal and has not given other options in many situations.

Personally, I find this topic interesting for a few reasons. Firstly, the global pandemic presented new circumstances for workplaces, and following the change was interesting in the midst of the arguably negative situation. The unique setting provides us with an interesting research topic on how laggards have adapted to the forced adaptation. Secondly, remote work is becoming more common and examining its effects is both, an interesting and a current topic. Thirdly, as somewhat a later adopter of video meeting technologies, I have personally liked face-to-face meetings better. While I have no issue with using different remote meeting technologies, I can partly relate to the Laggards who had more issues with adaptation to the new situation.

The main beneficiaries of this research are employers who may employ Laggards that are unwilling to deal with new technologies and circumstances. The ways of communication are changing, and new technologies are becoming an everyday norm at workplaces, and

therefore, the importance of navigating this gradual change is constantly growing. This unique situation presents an opportunity to examine how the change has been perceived by Laggards and how employers can help laggards to adapt to these new technologies in order to create workplaces with fewer discontinuities. As a report by BCG (2020) suggests, the situation caused by the pandemic is an opportunity to reinvent workplaces. Furthermore, this study contributes to the research on DOI and remote work, which is beneficial as especially the latter is becoming more and more prevalent in the world of business.

1.2 Research Problem and Aims of the Study

Communication technologies have gained a stern foothold at workplaces and are continuing to become more prevalent. These communication technologies have changed the ways of working and the ways workplaces and their cultures operate. One of the emerging trends is remote work. While remote work has been possible before the prevalence of these communication technologies, the new technologies have made remote work easier and more common. For instance, holding remote meetings is relatively easy nowadays due to the advanced video and audio qualities provided by communication technologies and the fast internet connections that make high-quality video calls possible.

However, the communication technologies and different remote work options can also create issues when, for instance, the technologies are not performing as well as expected. These difficulties are defined as discontinuities (Watson-Manheim et al., 2011). For the individuals who are described as Innovators by the DOI theory, the discontinuities may not be an issue. For Laggards, however, discontinuities may be the reason to not get on board with the technologies. Now that even Laggards have been forced to do remote work and use these technologies, an interesting research target has arisen. How have Laggards adapted to the situation, and have the enforced use of remote work technologies played a part in this? Have the views remained the same or changed, and if changed, how? What have the employers done to make this shift easier, or what could they have done? The topic provokes many questions about Laggards and their adaptation. However, due to the difficulty to indisputably distinct whether an individual is a Laggard or a later part of the Late Majority, the study refers to the likely Laggards as late technology adopters or late adopters.

Thus, the study aims to answer to the following research questions:

1. How have late technology adopters adapted to the enforced remote work and the use of remote work technologies during the COVID-19 pandemic?

2. Have their views changed on the remote communication technologies such as Teams, Zoom, etc.?

3. How have employers' actions affected the adaptation?

This research aims to contribute to the discussion about DOI at workplaces and the examination of discontinuities of remote work by researching the effects and the outcomes of the forced remote work caused by the Covid-19 pandemic. Furthermore, the study aims to gather insights on the effects of Covid-19 pandemic on the workforce whose work has been disrupted with remote work, and how the adaptation process to the remote work technologies has gone. All this is examined mainly from the viewpoint of late adopters. Thereby the study aims to contribute to the research on remote work and remote work technologies from the late adopter perspective.

The theoretical review on the existing literature will provide a thorough introduction to the topic while gathering what is already known on the topic. Then, the empirical part that consists of interviews will dive into the current situation that can provide interesting, real-life insights to the existing theoretical research while providing new suggestions for it. The research will be qualitative in its nature.

2 Literature Review

2.1 Introduction

The global COVID-19 pandemic has shifted the ways people work. As Savi´c (2020) observed, the pandemic has increased remote working and contributed to the digital transformation of labour. Many employees, who have no previous experience from working remotely and have no training for it, have been forced to do so (Newman & Ford, 2020). This has presented a situation where employees have relied on communication technologies more than perhaps ever (Madianou, 2020). The situation can shine new light to the topics of communication technologies and remote work.

The literature review begins by reviewing the theoretical framework, discussing the Diffusion of Innovations theory, relevant communication technologies and the concept of remote work. Then, these elements will be examined through literature that has been written during and/or from the perspective of the COVID-19 pandemic.

2.2 Diffusion of Innovations

Innovations are adapted in different paces by different types of people, and this phenomenon is called Diffusion of Innovations (Rogers, 1962). Diffusion is defined as “the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 1962, pp.5).

Innovation can be defined in many ways. A very early definition by Schumpeter (1934) is that innovation is either new combinations or new production functions. Furthermore, Kanter (1983) defines that innovation is the process of realizing a new, problem solving idea for commercial use. Once introduced, innovations are either rejected or adopted. Cooper (1998) suggests that innovation is a multi-dimensional concept that should be examined by terms of the attribute combinations it possesses. Innovation can be defined and discussed from several viewpoints and definitions, but in this research, the focus is on the innovation of information communication technologies that have been in a key role during the COVID-19 pandemic.

According to Rogers (1962), innovations can have five types of characteristics: relative advantage, compatibility, complexity, trialability, and observability. These

characteristics also determine how the diffusion process progresses. Mazzarol and Reboud (2019) explain the effect of each characteristic in the following way:

> *"...does the innovation offer any significant relative advantage over existing technologies or processes? Is it of a complexity level that makes it difficult to use or employ? Is the new innovation compatible with existing technologies or processes, or will it force these to be replaced? (As noted previously, this can be the cause of conflicts.) Can the new innovation be subject to trial before adoption and is it something that can be observed in practice before adoption?" (Mazzarol & Reboud, 2019: 171).*

Another perspective to the characteristics of an innovation is examining the innovation through two factors: public versus private consequences (e.g. Meyer & Rowan, 1997) and/or benefits versus costs (e.g. Fliegel & Kivlin, 1966). Cooper (1998) suggests that an innovation is not just a product, but a multi-dimensional concept that has three determining dimensions. No matter what way the characteristics of an innovation are examined, the characteristics are essential for whether or not the innovation is adopted (e.g. Mazzarol & Reboud, 2019). In addition, the pace of the innovation diffusion is dependent on the social and economic conditions that apply and the possible political support or opposition (Mazzarol & Reboud, 2019).

As mentioned, innovations are either adopted or rejected, and the decision on whether to adopt or reject the innovation is called an innovation-decision. Three types of innovation-decisions exist. Firstly, optional innovation-decision implies that the individual makes the decision independently, or at least as independently as possible in a social system. Secondly, collective innovation-decision implies that the decision is made in consensus with the members of the social system. Thirdly, and perhaps most importantly for this study, authority innovation-decision implies that the decision is made by a relatively small number of individuals who possess some kind of power or authority in the social system. (Rogers, 1962)

DOI is not the only theory that examines how innovations are adapted. Models such as Theory of Reasoned Action model, or TRA (Ajzen & Fishbein, 1980) and Technology Acceptance Model, or TAM (Davis et al., 1989) examine and aim to predict how people's attitudes, perceptions, behavioural intentions, etc. can affect how people end up behaving and therefore, whether they end up using a new technology. However, DOI was chosen for this research due to the aim to examine workers that are last to adapt new technologies, to which DOI is the most suitable one. Furthermore, most new innovations examined through DOI are technological innovations, which again supports this decision (Rogers, 2003).

Different perspectives on the elements of diffusion exist. Rogers (2003) lists the elements to be innovation, communication channels, time, and social systems. On the other hand, Wejnert (2002) suggests that diffusion consists of and is dependent on three major components: characteristics of innovations, characteristics of innovators (or actors), and the environmental context. Most of the research, however, is focused on the innovator/actor perspective, examining how different individuals adopt innovations. According to DOI, the population is divided into five adopter categories based on the pace in which they adapt new innovations. The categories are, from the earliest adopters to the latest: Innovators, Early Adopters, Early Majority, Late Majority, and Laggards (Rogers, 1962). The process of innovation diffusion is often lengthy (e.g. Rogers, 1962).

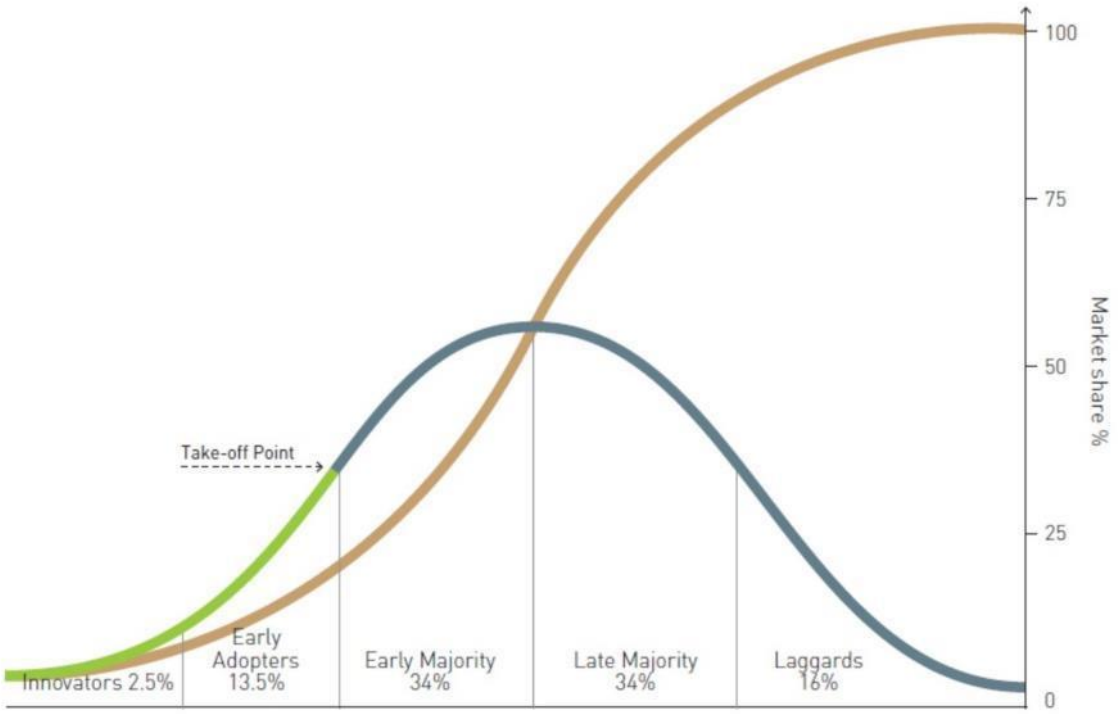

Figure 1: Diffusion process. (Hanley, 2018).

As this study focuses on Late Majority and, especially, Laggards, the definitions of the two are as follows: Late Majority are just after the average member in the social system in adopting the innovations, whereas Laggards are suspicious about the innovations and have a lengthy adoption process (Mazzarol & Reboud, 2019). The term "laggard" carries a negative connotation – for instance, Collings Dictionary defines laggard as something that is not performing as well as its competitors, or someone who is slow or falling behind (collinsdictionary.com, n/a) – but in this study, the term is used neutrally to describe the part of the population that adopt new innovations later than others.

Late Majority and Laggards comprise approximately 50 per cent of the population, and Laggards have debated to comprise around 15 to 20 per cent of the population (e.g. Mahajan et al., 1990; Rogers, 2003; Goldenberg & Oreg, 2007; Moore, 2014). Thus, understanding this group is essential when an innovation is in the adoption process (Uhl et al., 1970). Socio-economic factors, like age and income, may have some indications on whether people are Laggards, but contradictory findings on the different factors exist (e.g. Uhn et al., 1970; Rizzuto, 2011), and therefore, different factors cannot indisputably explain whether an individual is a Laggard. Based on the study by Uhn et al. (1970), Laggards tend to cling to products that have proven to work, and therefore they tend to avoid new, risky and unproven products.

While Laggards may be dismissed by marketers and managers (e.g. Goldenberg & Oreg, 2007, Jahanmir & Lages, 2015), research has also found potential in them. The critical insights that Laggards naturally have can be used to figure out how to simplify adoption process and determine possible weaknesses that innovations have (Jahanmir & Lages, 2015). As Mazzarol and Reboud (2019) argue, sometimes an innovation may fail purely because people lack understanding on how the technology may be feasible and demanded.

2.3 Information and Communication Technology

New information and communication technologies and virtual technologies have changed the way people work (e.g. Bouwman et al., 2005). As technology has advanced, mobile connections have become rather affordable and effective and enabled the use of different communication technologies, which has often removed the need to be physically present (Allen et al., 2015). Thus, the fact that technology has enabled virtual work is also the main reason remote work has become more prevalent (e.g. Young, 1995; Golden, 2009; Madianou, 2020).

Information and communication technology (ICT) can be defined in many ways. A commonly accepted definition is provided by TechTerms (2010), defining that ICT refers to "technologies that provide access to information through telecommunications". However, this study focuses on ICT used during and because of remote work, hence the technology can be considered remote work technology. Here, remote work technology is defined similarly to Fernandez' (2020: 21) definition: "any technology that makes it easier for users to work remotely - - virtual communication technologies that replace in-person activities".

Later in the study, the technologies examined in the empirical part of the study will be defined further. For now, the broader definition by Fernandez is used.

Again, advanced ICT is the reason remote work has become more common because generally, remote work requires different communication technologies to be successful. Remote work should not, and often cannot, happen in full isolation – instead, it should involve different ways of communication (Young, 1995). Especially collaboration and teamwork require communication technologies to mediate remote interaction between colleagues and other stakeholders (Kraut et al., 2002). During the COVID-19 pandemic, communication technologies have been at the centre of the pandemic as people have been almost exclusively dependent on communication technologies to perform their work (Madianou, 2020).

Many factors have a role in whether the usage of ICT is successful at workplaces. At workplaces, the decision on the adoption and usage of different technologies is highly dependent on the organization, and individuals may not have as much say in it (Bouwman et al., 2005). Andriessen (1989) addresses the diffusion of new technologies in organizations with a model of six phases in the development and introduction of innovations: research, development, diffusion, adoption, introduction, and incorporation. Van den Hooff (1997) defines these stages to be adoption, use, and effects. Later, Bouwman et al. (2005) build on the models by Andriessen and van den Hooff, determining that the phases are the following: adoption, implementation, use, and effects.

In order to use technologies, certain skills and/or training is needed from workers, and lack of ICT skills can cause issues. (e.g. Wang & Haggerty, 2011; Finnie et al., 2018). Wang and Haggerty (2011) emphasize the importance of individual virtual competence and its effect on the outcomes of the individual's performance. A study by Earth Institute of Columbia University and Ericsson (2016) notes that the amount of training for personnel needs to be significant in order to manage ICT systems. In a study by Fulk (1993), peer support is found to be important in technology adoption. Especially for advanced capabilities and features, the study finds that workers rely on their co-workers for help. Virtual workplace technologies are no different. Technologies such as Zoom and Teams are still relatively new. Certain level of individual virtual competence (Wang & Haggerty, 2011) is needed to effectively use these technologies.

The study by BCG (2020) found that the connection between productivity and employee satisfaction on their tools is high. When the employees were satisfied with their tools, they were twice as likely to maintain or improve their productivity on collaborative

tasks in comparison to those who were not satisfied with their tools. Again, as employees may not have much say in the ICT used (Bouwman et al, 2005), a successful ICT implementation requires the organization to take the employee satisfaction into account.

Furthermore, trust is a significant factor in technology usage. Lankton et al. (2015) note that defining trust in the technology is not necessarily clear-cut, because trust is traditionally a trait reserved for human-to-human interaction. Still, trust is important in technology usage because an individual is more likely to use a technology if the individual finds the technology trustworthy (McKnight et al., 2011). When the individual is assessing whether to trust the technology, the characteristics of the technology and the technology provider matter (Bahmanziari et al., 2003).

2.3.1 ICT in Remote Work

Going back to the earlier definition by Fernandez (2020), remote work technology can be any kind of technology, often virtual communication technology, that makes remote work easier for the workers and replaces in-person interaction. As the definition is quite broad, discussing the different options is needed.

Firstly, the communication technology requires certain other technologies to be present in order for it to work. As Cooper (2019) lists, fast and reliable Internet access, Virtual Private Network, and a mobile device (with web and video conferencing abilities) are needed. For instance, video conferences require workers to have high-speed Internet access, a microphone, and a quality web camera (Roseberry, 2008). Secondly, many types of ICT exist for remote work, but the options can be confined in a few types of ICT tools. Roseberry (2008) lists four types of remote communication tools: telephone and other voice-based methods such as VoIPs, emails, video conferences, and instant messaging. Kraut et al. (2002) also list tools like document sharing and bulletin boards. Cooper (2019) echoes these studies, listing that remote workers need to have communication and collaboration tools, project management tools, and document management suites.

Many technologies combine several of these tools. The communication technologies the most relevant for this study are communication technologies that are relatively new and include different forms of communication. Thus, the study mainly focuses on technologies that include at least VoIPs, video conferences, and instant messaging. The most relevant technologies in this study will be discussed in the findings section.

2.3.2 Laggards and Technology

When discussing laggards and technology, the concept of digital divide is relevant. Digital divide, as defined by Fink and Kenny (2003), is defined in several digital gaps. These digital gaps include a gap in access to ICT, a gap in actual amount of use, a gap in the impact of use, and, perhaps most important to this study, a gap in the ability to use ICT that is measured in the skills an individual possesses regarding the use of ICT. As Young (1995) points out, the individuals that have limited experience in using communication technologies – i.e., Laggards – may believe that the technologies are no substitute to face-to-face communication. Even to this day, some employees have never worked remotely, and have now due to the pandemic been faced with a situation they have no experience of or training for (Newman & Ford, 2020). The skill of individual virtual competence has become increasingly important, and the workers with higher individual virtual competence are likely to be more effective and achieve better results (Wang & Haggerty, 2011). Ravichandran (2018) finds that when an organization has superior information system capabilities and invests heavily on information technology, the organization is able to become agile. Thus, focusing on enhancing the technological abilities of Laggards is beneficial for organizations.

2.4 Remote Work

In the recent years, traditional work structures have expanded due to the increased global connectivity that is driven by factors like innovative technologies, demographic shifts, globalization, and the rise of the gig economy (Anani, 2018). One structural change is that alternative work arrangements like working from home, part-time work and flexible scheduling are becoming more and more common (Mas & Pallais, 2017). Furthermore, work teams may be geographically dispersed even when remote work is not enforced (Pollitt, 2006; Malhotra et al., 2007). Thus, remote work and telecommuting have become increasingly popular (e.g. Allen et al., 2015). Especially in 2020, during the COVID-19 pandemic, remote working has become “the new normal” (Pattnaik & Jena, 2020).

Remote work has several synonyms, some of the most common being telecommuting, telework, virtual work, and distance work (Allen et al., 2015). While often used interchangeably, the terms often have slight conceptual differences. The study by Allen et al. (2015) has listed some of the most common definitions. For this study, the terms remote work, telecommuting and telework are the most relevant. The terms are defined below.

Remote work.

> *"A work arrangement in which the employee resides and works at a location beyond the local commuting area of the employing organization's worksite. The arrangement generally includes full-time telework and may result in a change in duty location to the alternative worksite (e.g., home)." (United States Office of Personnel Management, 2013: 18)*

Telecommuting.

> *"Telecommuting is a work practice that involves members of an organization substituting a portion of their typical work hours (ranging from a few hours per week to nearly full-time) to work away from a central workplace—typically principally from home—using technology to interact with others as needed to conduct work tasks." (Allen et al., 2015: 44)*

Telework.

> *"Telework can broadly be defined as work conducted from a location other than the conventional work site whilst connected to the firm's computer systems by means of information and telecommunications technology (ICT)." (Aguilera et al., 2016: 3)*

In this study, the terms telecommuting and remote work will be used interchangeably, since the focus on the study is on the usage of the technologies from a remote location – i.e., conducting telework remotely, usually from home due to the pandemic and its restrictions. Thus, for the purpose of the study, either term is suitable.

In addition to the remote telework, virtuality is a commonly used term regarding remote work. As Watson-Manheim et al. (2002) discuss, the term "virtual" has many definitions and dimensions related to, for instance, the location of the employees, location and type of the work conducted, and the type of relationships the organization has with its employees and other organizations.

Many of the difficulties in remote work are caused by discontinuities. As a noun, discontinuity refers to "gaps or a lack of coherence in aspects of work, such as work setting, task, and relations with other workers or managers" (Watson-Manheim et al., 2002: 193). In a greater sense, discontinuities may have to do with organisational culture (Asatiani et al., 2020). What happens during a discontinuity is that information and communication flows are changed in a way that calls for awareness on how to handle the change (Watson-Manheim et al., 2011). Discontinuities often occur in virtual work environments and cause issues during the sessions (ibid.), and as virtuality is an essential part of remote work, discontinuity is a relevant term and phenomenon when examining remote work and

technologies related to it. To combat these discontinuities, companies need to construct continuities that replace the discontinuities (e.g. Watson-Manheim et al., 2002; Watson-Manheim et al., 2011; Asatiani et al., 2020).

The success of the remote work can depend on the person, the job, and the organization (Allen et al., 2015). In order to understand the affecting factors better, the following sections will discuss the positive aspects and opportunities, and the challenges and discontinuities of remote work from three viewpoints: organizational, social and technological. This perspective also partly aligns with the different elements of DOI that are innovation, actors and environment (Wejnert, 2002). It is notable that these categories may have overlaps as they are affected by each other in a remote work environment, i.e. they operate under the principle of joint causation (e.g. Katz & Kahn, 1966; Bélanger et al., 2013).

2.4.1 Organizational Aspect

This section discusses what kind of implications remote work may have for the organization in which the remote work is conducted.

The types of jobs and tasks in the organization affect the effectiveness of remote work, and therefore, remote work is not available for every worker. Remote work is only available for certain categories of employees; Aguilera et al. (2016) found that the level of autonomy the employee possesses affects whether the employee can work remotely. Furthermore, some fields of work, such as customer service in retail, may not be possible to do remotely (Cook, 2019). Instead, the jobs that are suitable for remote work are often jobs that consist of information processing and do not involve physical contact (Jacobs & Van Sell, 1996).

Remote work can provide organization with many benefits. Generally, workers tend to be more productive when they are working remotely, and in addition, remote workers are more likely to complete projects ahead of schedule and be more creative because they have less distractions (e.g. Jacobs & Van Sell, 1996; Allen et al., 2015; Cook, 2019). The option of virtual remote work also enables more global work, which can be more motivating and satisfying than local work, which in turn can lead to more innovative performance and higher level of employee growth (Malhotra et al., 2007; Nurmi & Hinds, 2016). Hiring managers find that finding employees with the right skills is more important than finding employees that work at the office location (Upwork, 2018). Furthermore, remote work may result in cost savings for the company (Global Workplace Analytics, n.a.).

When the organization works virtually, organizational culture matters, because the goals and objectives of the organization need to be very clear for good performance (Asatiani & Penttinen, 2018). Upwork (2018) reports that companies tend to have the resources for remote work but lack the policies to support it. The challenges of organizational culture in virtual work environments were also examined by Asatiani et al. (2020). According to the study, the digital artefact that substitutes socialization needs to overcome three cultural challenges in virtual work environments for it to be an effective substitute.

The outcomes of remote work are also dependent on the situation and environment. Golden and Veiga (2005) point out that after a certain amount of remote work, the organization might reserve diminishing returns. This is echoed by the research by Allen et al. (2015), which suggests that remote work is the most beneficial when the extent of it is moderate. Certain fields receive more benefits from remote work than others – for instance, innovation often benefits from face-to-face communication (Coenen & Kok, 2014), which is why remote work may not be an ideal option for innovative industries.

Leaders also face issues in remote work – when leaders cannot physically observe the team, evaluating things such as motivation, sufficiency of resources, and need for direction becomes difficult (Malhotra et al., 2007). Pollit (2006) emphasizes the importance of managing and motivating a team whose members are working in different locations. According to the article, managers are in a key role regarding the success of the remote team, and their main task is to ensure that enough communication takes place, and the communicated information is clear and sufficient. The same ideas are echoed by Newman and Ford (2020), who discuss the importance of having leaders who know how to manage a team virtually and offer a five-step framework for creating and maintaining a successful work culture even when working virtually. These steps are the following:

> *"The five steps we offer are, first to establish and explain the new reality; second, sustain the corporate culture and reinforce the perception of leader trust worthiness; third, upgrade leadership communication tools and techniques to better inform virtual employees; fourth, encourage shared leadership among team members; and fifth, to create and periodically perform alignment audits to ensure virtual employees are aligned with the organization's cultural values including its commitment to mission." (Newman and Ford, 2020: 2)*

In order to have a successful remote work environment, Baker et al. (2006) find that information about remote work should be centralized within the organization, preferably in

the IT departments. According to the study, this kind of support has a broad impact on factors such as job satisfaction.

2.4.2 Social Aspect

The social aspect has many layers to it: for instance, it includes psychological aspects, demographic characteristics, and the degree of professionalism, which all can be examined both on an individual level and on a group level (Bélanger et al., 2013).

Starting with the individual level, remote work has many implications. On one hand, remote work is appreciated by workers. According to the study by Mas and Pallais (2017), working from home is the most valued alternative work arrangement (in comparison to flexible scheduling and part-time work), even to the extent in which job applicants are willing to have 8 per cent lower wage if the job has an option to work from home. Furthermore, remote work provides new opportunities for certain groups – for instance, for disabled people, working from home may enable a suitable working environment that might not be available at offices (Allen et al., 2015). Working from home can decrease employees' stress levels (Igbraria & Guimares, 1999) and allows increased flexibility for workers to manage their work-life balance (Golden, 2009), partly because the employees need to spend less time travelling to work (e.g. Cook, 2019).

On the other hand, remote work also has negative aspects on the individual level. While remote work has been found to help manage work-life balance, contradictory studies also exist. Palumbo (2020) concluded that remote work may make balancing work and life more difficult. For instance, remote work may cause overlaps between work and personal commitments (Allen et al, 2015). Also, remote work may create stress and a sense of isolation as workers are separated from their peers (e.g. Parikh & Surana, 2005; Wang et al., 2019). One stress-creating factor comes from employees who are afraid of being forgotten once they are not constantly at the workplace (e.g. Igbraria & Guimaraes, 1999; Solomon, 2000; Wang et al., 2019).

Then, on the group level, remote work has its challenges and benefits. BCGs study on remote work (2020) suggests that the most challenging task regarding remote work is maximizing the social connectivity that takes place in the office. As Young (1995) finds, electronic communication may decrease workers' ability of face-to-face communication and interpersonal skills. Similarly, constantly working remotely may make employees feel isolated (e.g. Wang et al., 2019).

Virtual teams i.e., teams whose collaboration happens in a digital space, face many types of issues. For instance, if the team has members who live in different countries and, therefore, work from different countries, the team may experience coordination barriers that are related to the physical distance and different time zones, cultural differences that may lead to cross-cultural and language barriers, issues with really learning to know and trust the team members that may cause team cohesion barriers, and barriers in understanding the mission and the goals of the team (e.g. Malhotra et al., 2007; Brandt et al., 2011). As an example, trust may act as a barrier because it affects many aspects of remote work. On individual level, the aspect of trust at workplaces affects how individuals perceive remote work (e.g. Malhotra et al, 2007; Brandt et al., 2011). Individuals who consider that their leader trusts them are more likely have higher job satisfaction during remote work (Baker et al., 2006). On the opposite side, trust affects leaders as they cannot observe their team in real life and have to trust that the employees will create positive outcomes (Malhotra et al., 2007; Cooper, 2019). Teamwork is affected as well, as the members of the team must be able to trust other members despite not seeing each other constantly. (e.g. Malhotra et al., 2007; Brandt et al., 2011).

Collaboration at a distance tends to have less frequent communication with longer time periods between the communication, which can make remote work environments less successful that physical ones (Kraut et al., 2002). One way to overcome this is to use all opportunities for interaction to make it more frequent (Curs ̧eu et al., 2007). As Roseberry (2008) suggests, a video conference is the closest substitute to face-to-face meetings, and therefore video conferences can be used when trying to substitute in-person communication. However, studies have found that sometimes, face-to-face communication is better for certain situations. For instance, Young (1995) finds that especially more complex issues require face-to-face communication for more interactive feedback. In addition, developing trust, cohesion and getting to know new people can often require direct face-to-face contact (Curs eu et al., 2007).

Also, more casual conversations are difficult to duplicate during remote work (Fernandez, 2020). Instant messaging programs can act as a solution, but these programs have also drawbacks in the form of decreased productivity and perceived feeling of never being able to leave work, as new conversations can arise constantly and at any hour. The upside of this is that working from home and lacking casual conversations may offer employees the possibility to concentrate on work more without distractions and interruptions (Cook, 2019).

Furthermore, online communication is also believed to increase social connectivity and therefore have a positive impact on adults' social well-being (e.g. Berkman et al., 2000; Hawkley and Cacioppo, 2010). Hage et al. (2015) find that for older adults, the initial level of social connectivity plays a role in whether online communication enhances social connectivity – if the individual is already feeling a high level of social connectivity, online communication has no negative effect on it. Furthermore, the same study finds that the characteristics of the used communication tools have an impact on the level of social connectivity as well. Steinfield et al. (2008) studied young adults, finding similar results: according to the study, online communication can increase social connectivity with certain limitations. Thus, increased online communication during remote work can have either positive, non-existent or negative effects on workers.

Remote work also affects the work of leaders and managers. On one hand, remote work may lessen the organisational culture of monitoring inputs rather than outputs, as sometimes the performance of employees is evaluated by the time they spent at the office rather than the outputs they provide (Cook, 2019). This may also result in leaders finding that when working remotely, managing by outcomes becomes easier, and "presenteeism" (i.e. going to work despite health issues etc.) may decrease (Simpson, 2019). Furthermore, leaders may experience outcomes such as improved job performance, job satisfaction, and well-being from the team when they have the option to work remotely (Cook, 2019). While leaders may experience positive outcomes, the situation also raises issues for leaders. For instance, as employees are out of sight, the possible dissatisfactions go more easily unnoticed as the leader cannot catch cues from body language or informal meetings throughout the day (Newman & Ford, 2020).

2.4.3 Technological Aspect

An essential part of the technology aspect is what kind of technologies are used when working remotely. The technology use and the characteristics of the virtual organization need to be a proper fit (Asatiani & Penttinen, 2018).

The ICT technology used is important. When the technology is satisfying and supports working properly, employees are more satisfied and therefore, more productive (BCG, 2020). For instance, the quality of the internet connection plays a significant role in successful remote communication (Roseberry, 2008). In addition to the quality of the tools, employees must possess the skills that are needed to use the tools in an effective way (e.g.

Wang & Haggerty, 2011; Finnie et al., 2018). Another important aspect is having sufficient IT support in case problems arise, which is perhaps even more important than having initial training for the usage of technologies (Baker et al., 2006). The increased use of mobile technology may also cause stress for workers as mobile devices have increased interruptions related to work significantly due to features like instant messaging (Tams et al., 2020).

On a group level, technology has its implications as well. While factors such as the quality of the internet connection affect individuals' work, it may also impact the group performance – for instance, if one of the group members has a poor connection, the other members are affected by it as well (Bélanger et al., 2013). Furthermore, even if some of the team members are not working remotely, they have to be capable of using the remote work technologies if one or several of the team members work remotely, i.e. training is not only needed for the remote workers but also the peers of the individuals that work remotely (Baker et al., 2006).

As an example of the possible group level challenges, video conferences may cause discontinuities within a virtual team. A study by Lepsinger and DeRosa (2015) found that out of 304 individuals, 25 % did not find their remote teams fully effective. Many reasons for these discontinuities may exist; for instance, team members may experience issues with their internet connections, which disrupts the whole meeting (Roseberry, 2008). Thus, minimizing the discontinuities with right measures is a key to having a successful virtual team. For example, continuing with the example of video conferences, all participants should test their equipment properly before the video conference to avoid issues during the conference (ibid.). This includes testing both the audio and the video, and making sure that the internet connection is able to transmit and receive quality signals (ibid.). Also, possible differences in time zones should be taken into account (ibid.) Some technologies, such as Microsoft Teams, allow everyone to see the same document on the screen in real time, which can help remove the discontinuity that is created when everyone is not physically in the same place to see the documents presented (Olear, 2020).

2.5 COVID-19 Pandemic

The COVID-19 pandemic has changed the whole world, including how people work. Because of lockdowns and restrictions, many workers were forced to work from home (e.g. Anderson & Kelliher, 2020; Savi´c, 2020). This section of the literature review will examine the effects COVID-19 has had on workers, their ways of working and the perceptions they

may have on remote work and the technologies related to it. The previously discussed concepts and frameworks (for example, communication technologies and remote work) will be framed by terms of the COVID-19 pandemic. Thus, the literature will mostly be from the year 2020.

2.5.1 Recapitulation on COVID-19

In December 2019, World Health Organization (WHO) got its first information about a "viral pneumonia" in Wuhan, People's Republic of China. Throughout January 2020, WHO gathered and provided information on the situation, having meetings and discussions with public health leaders from around the world. The novel coronavirus was found to have human-to-human transmission, and cases of the virus started to emerge in different parts of the world, all of which were found on people who had travelled from Wuhan. On 30 January, WHO declared the novel coronavirus outbreak a Public Health Emergency of International Concern. In February 2020, the virus was named COVID-19, and it kept spreading with an alarming speed and severity. On 11 March 2020, WHO assessed that COVID-19 could be characterized as a pandemic. (WHO, 2020)

As the situation unfolded, governments started placing restrictions and lockdowns while businesses began facing losses. Workers all around the world became vulnerable to income losses and layoffs, and International Labour Organization (ILO) estimated that working hours would decline by 6.7 per cent in the second quarter of 2020, equivalent to 195 million full time workers. (International Labour Organization, 2020)

The peak in different restrictions affecting workforce was hit in April 2020, when ILO estimated that 97 per cent of the world's workforce was living in countries where workplace closure measures took place (International Labour Organization, 2020). According to Brenan (2020), by April 2020, 62 % of U.S. workers reported that they had worked remotely during the crisis.

In September 2020, International Labour Organization reported that 94 per cent of the world's workers were living in countries where some kind of workplace closure measures were in place. According to the same study, 32 per cent of the world's workers were living in a country where lockdowns for all but essential workers were taking place in August 2020. (International Labour Organization, 2020).

2.5.2 Effects of COVID-19 on the Workforce

The pandemic has had severe ramifications. The global economy has suffered greatly from the pandemic (e.g. The World Bank, 2020; World Economic Forum, 2020). The pandemic has also had smaller-scale implications: as technology has become more central, risks regarding cybersecurity, digital fragmentation, privacy violations and inequality have increased (World Economic Forum, 2020). However, this study will focus on the implications it has had for the workforce specifically, and even more precisely, workers who have worked remotely throughout the pandemic.

The workforce has been affected in several and/or major ways. According to International Labour Organization (2020), the pandemic has been the most severe crisis since the World War Two. The disruption COVID-19 has caused to the economy has resulted in immediate effects to the employment, affecting approximately 81 per cent of the world's workforce (ibid.). According to Brannen et al. (2020), the pandemic has hit the people closest to the poverty line the hardest. The main reason is that the jobs of the "real economy", i.e. essential services and physical products, are the most affected by measures such as lockdowns. While World Economic Forum (2020) speculates that the situation may help improve their wages and job quality, they are still at the risk of health issues and job losses. However, while the consequences have mostly been negative, a few positive implications for the workforce exist as well. For instance, new employment opportunities have been created by the contact-free ways of behaviour (ibid.).

2.5.3 COVID-19 and Remote Work

This section discusses the main focus of this study, which is the implications of COVID-19 on remote work.

As Anderson and Kelliher (2020) point out, remote work has generally been considered to be an active choice by employees, rather than an enforced activity. However, the COVID-19 pandemic has forced many employees to work from home due to different restrictions such as lockdowns (e.g. OECD, 2020). These restrictions have led to a situation where new ways of working have been adapted, which has had both positive and negative consequences. The disruption has arguably been irreversible. According to Gosling et al. (2020), remote work will continue to be more prevalent even after the crisis and its circumstances are over as two out of three employees are expected to be working remotely more often. However, it is notable that remote work is generally mainly applicable for white

collar workers (e.g. World Economic Forum, 2020), which will be the main focus of this study.

This section will be structured similarly to the previous, more general section on remote work, and there will be three aspects discussed. The three aspects are organizational, social and technological, respectively. Again, it is important to note that the sections may have some overlaps.

Firstly, organizations, i.e. employers, have had issues with adapting to the sudden increase of remote work. According to research by SHRM (2020), in April 2020, 34 per cent of employers did not have and emergency plan prior to COVID-19, and over 70 per cent of employers were struggling to adapt to remote work. About 40 per cent of employers had shut down some aspects of their businesses, and 83 per cent had made business practise adjustments.

According to the study by Belzunegui-Eraso and Erro-Garcés (2020), the crisis has allowed companies to assess which activities and processes could be done remotely by teleworking. The study also found that most activities can be developed to the point where they could be done from home if small adaptions were made. As the situation has made the pace of digitalization quicker (Savi´c, 2020), learning how workers adapt to using teleworking technologies has become increasingly important. Respectively, organizations have needed to consider the fact that employees may not have ideal conditions for effective work at their homes (e.g. Gómez et al., 2020).

Secondly, remote work has affected the social side of work. Forced remote work has had different implications for employees. On the positive side, some workers do not find the increased remote work negative. Based on the survey by Global Workplace Analytics, 76 per cent of global office workers would want to continue weekly remote work after COVID-19 (Lister & Kamouri, 2020). Some workers have even indicated that their productivity has increased due to remote work – according to BCGs study (2020), 75 per cent of the respondents were able to maintain or improve their productivity on individual tasks, and 51 per cent of the respondents were able to maintain or improve their productivity on collaborative tasks.

The workforce has needed to adapt to new ways of working. While those with the possibility of remote work are in a better situation to those who have lost their jobs, the enforced remote work has created additional stress for workers (Newman & Ford, 2020; World Economic Forum, 2020). Palumbo (2020) observes that especially workers with strong work engagement are at risk of losing their work-life balance during lockdowns and

increased remote work. Enforced remote work creates challenges – for instance, working from home might result in being distracted by the other members of the household that share the same work environment (Waizenegger et al., 2020). Also, the workers who have never (or seldomly) worked remotely were forced to suddenly do so and learn new skills that they had no proper training for (Newman & Ford, 2020). Furthermore, since the situation has been very sudden, employees may not have had time or possibilities to ensure that their homes are suitable for remote work (e.g. Gómez et al., 2020).

Managers have also had to adapt to the situation. Some managers may not have experience on how to lead virtual teams successfully (Newman & Ford, 2020). Thus, managers have needed to adapt to the different ways of working as well. For instance, Ulster University (2020) has listed tips for managers, including resourcing the team with proper tools, ensuring good level of communication, creating genuine connection even remotely, building trust and flexibility, etc. Especially trust has been an essential element in remote working. According to Gosling et al. (2020), trust has been a crucial factor in navigating the uncertain times as managers have needed to trust their employees and employees have needed to trust their managers.

Thirdly, the sudden remote work has had technological implications for both organizations and workers. As mentioned earlier, different ICTs have been in the centre of the pandemic because of the highly transferrable nature of COVID, which has led to social distancing and use of technology (Madianou, 2020). According to McKinsey (2020), the crisis has transformed business irreversibly as the forced remote work has quickened the adoption of technologies. Furthermore, Ågerfalk et al. (2020) conclude that the response to the pandemic is fuelled and facilitated by information systems. This has emphasized the strategic importance of technology. Similarly, Savi´c (2020) claims that the pandemic as speeded the digitalization of labour. Furthermore, the pandemic has redefined how quickly organizations need to be able to engage new technologies (Accenture, 2020). A survey conducted by EY (2020) reveals that approximately 46 per cent of companies do not have a workforce with enough skills to effectively leverage the technologies the company has adopted. Thus, organizations have had to invest in training the workers' ICT skills (OECD, 2020). Organizations need to stay up-to-date with the wants and needs of employees in order to keep up with the changing trends (Accenture, 2020).

The crisis has also had technological implications for individual workers. According to Gosling et al. (2020), employees find that even after the crisis, increased digitalization at workplaces has been the second on the list of factors that have been changed the most

permanently. The situation has led to a rapid reskilling and upskilling, as employees have needed to adapt to new, advanced technology (e.g. EY, 2020; World Economic Forum, 2020). The crisis has highlighted that the most important factor in updating any technological aspects at workplaces is the workforce that uses the technology, and how comfortable the employees feel when using it (Ashok, 2020). Furthermore, the pandemic has highlighted the fact that currently, technology is not advanced enough to facilitate natural group experiences, since remote meetings do not allow dynamics such as people talking in subgroups in the same space (Hacker et al., 2020).

2.5.4 COVID-19 in Finland

This study is conducted in Finland, which results in a few contextual implications for the study. Like most other countries, the pandemic has had negative effects for the Finnish economy. According to OECD (2020), the pandemic has caused a deep recession for the Finnish economy. However, the same report noted that Finland was able to manage the first wave of COVID-19 rather well, and created a temporary layoff scheme to protect jobs and income.

However, in terms of remote work, Finland has been found to be quite elastic and adaptive. In Finland, the share of people conducting remote work is higher than the average, and Finland lands in top three of the biggest share of people using telework (OECD, 2020). Business Finland (2020) speculates whether the Finnish workforce is the "most COVID-19 resilient in the world", and accounts this on two factors: the advanced IT infrastructure and trust between the employer and the workers. Also, a significant proportion of the Finnish workforce is highly educated experts whose work is very suitable for remote work. Another article by Business Finland (2020) suggests that Finland has had good operational capability and has therefore been able to continue working rather well despite the pandemic.

3 Methodology

This section explains the methodology used for this research. Sources of data can be divided into primary sources and secondary sources (e.g. Saunders, 2007; Krishnaswami & Satyaprasad, 2010) and both sources of data were used in this study. The secondary sources were discussed in detail in the previous section, and this section discusses the primary data gathered.

This study is a qualitative case study in its nature, and more specifically, a single-case study. The nature of the COVID-19 pandemic calls for a single-case study, as the pandemic and its spread arguably create a rather unique situation.

3.1 Empirical Research

To start with, this study is a qualitative study, where the views and thoughts of the interviewees are examined. More specifically, the study is a qualitative single-case study. According to Yin (2003: 4), case studies are suitable for "a complex interaction between a phenomenon and its (temporal) context" and especially for contemporary events. Saldana et al. (2011) note that the value of case studies comes from a unit's in-dept examination, rather than from gathering a broad representation on a topic. These definitions accurately describe the context of this study, which is why the form of case study was chosen. The pandemic caused by COVID-19 is the case, or the phenomenon, and the remote work situation it has resulted in is the temporal context of it. Furthermore, this study is a single-case study. As the literature review has shown, the theoretical background used in this study is arguably well-formulated, and the unique situation of the pandemic allows a critical case experiment on the topics. Moreover, the situation is arguably both extreme and unique, which fits the rationale for using the single-case method (e.g. Yin, 2003). The study is a mix of descriptive and exploratory studies. It simultaneously aims to showcase an accurate description of the people in the middle of a phenomenon while assessing the phenomenon from a new perspective (Saunders, 2007). According to Saunders (2007), descriptive research and exploratory research may be used in one study.

In order to examine the topic, qualitative interviews on the issue were conducted. This research method was chosen because it was the best way to get thorough view on the thoughts of the interviewees, because interviews are an effective way to examine individuals' "perspectives, feelings, opinions, values, attitudes, and beliefs about their

personal experiences" (Saldana et al., 2011: 32). Conducting interviews allowed the interviewees to talk freely and in length, and express thoughts outside the realm of the initial questions. Furthermore, doing interviews in person or on phone (rather than in writing through, for instance, an email) allowed the interviewer to ask follow-up questions. To ensure that the principle of chain of evidence was maintained, each interview was recorded and, soon after the recording, transcribed. Filler words, broken speech and influent strings of speech were not included in the transcripts as they were not relevant for the nature of the study (Saldana et al., 2011).

3.1.1 Interview Design

The interviews were conducted in semi-structured, one-to-one form. This form was chosen because some structure was required in order to keep the interviews relatively similar, and because certain questions needed to be answered. However, since the purpose was to gather insights on the thoughts of the interviewees, it was desirable that the interviewees were able to express what they wanted without restriction and with the possibility to vary the structure of the interview if the discussion flew more naturally that way (e.g. Longhurst, 2003). Also, the option of follow-up questions was wanted. Thus, the initial interview questions were relatively broad and general, supported with some more specific questions for situations where the specific topics did not arise during the interview naturally. In all interviews, the language used was Finnish as all participants had Finnish as their native language.

Some of the interviews were held in person and some over the phone (see Table 1). While phone interviews have certain disadvantages, like inability to examine the interviewees reactions, characteristics, and responses (e.g., Saunders, 2007; Krishnaswami & Satyaprasad, 2010), this method was chosen due to the restrictions caused by the COVID-19 pandemic, which supported social distancing and minimizing in-person interactions during the time this study was conducted. However, the phone interviews also have positive effects. While these factors were not the main reason for choosing phone interviews, the phone interviews allowed the interview process to be faster, more cost-efficient and more accessible (e.g., Saunders, 2007). Furthermore, the interviewees were able to have the interview wherever they wanted to, which might have been a convenient and comfortable location for them, and this generally leads to better results (e.g. Saunders, 2007).

The actual interview questions were formed to be neutral and non-leading for as un-biased results as possible. As the interview style was semi-structured, a number of guiding,

preliminary questions were used as a guideline for the interview. These questions were rather vague questions around themes of the study, i.e. remote work, devices, communication technologies, support, team work, etc. However, the actual interview structure was allowed to flow as it naturally did, so interviews had differing structures. Furthermore, the interviewer followed the generally acknowledged principles for a successful interview. The interview was always started with relatively neutral and easy informative questions, like asking the interviewee to describe their work and name the communication technologies they used. The interviewer aimed to remain neutral and to create a respectful, friendly and open atmosphere (Krishnaswami & Satyaprasad, 2010).

3.1.2 Sampling

According to Saldana et al. (2011), selecting the right people are the most likely way to get meaningful answers and responses from the interview. The sampling of interviewees was done on a non-probability sampling. This method of sampling was chosen because the interviewees needed to fit to the agenda of the study. Because suitable interviewee candidates were rather difficult to find, the type of non-probability sampling was a mix of purposive, snowball, and self-selection sampling. At first, some suitable candidates were found based on purposive sampling (i.e. identifying suitable candidates from the known group of people) and on self-selection (i.e. publicising the need for people who met the criteria discussed below) from the contacts I have created through academic, professional and personal life. Then, once a few candidates were found by these methods, snowball sampling (i.e. asking the candidates to identify similar individuals) was used to find other candidates. The interviewees were found by asking around, both online and in person, for information about people who were forced to work remotely due to the pandemic.

Interviewees were chosen based on two criteria. The first criterion was that the person had been forced to remote work due to the situation, and therefore had to use remote communication technologies. The second one was that the potential interviewee considered themselves to be a part of either Laggards or Last Majority regarding the adoption of communication technologies. This was ensured by asking a couple of preliminary questions about their feelings towards the enforced remote work and use of remote work technologies. These questions were along the lines of “how have you felt about working remotely and using technologies such as Zoom and Teams?” and “how much have you used these technologies before, if you have?”. Once potential candidates were found, their suitability

was further ensured by having more thorough discussions with them, talking about the topics and discussing whether they considered themselves to fit the criteria of a Laggard (and/or Late Majority). The final sample was gathered by selecting suitable interviewees on the purposive sampling method based on the preliminary discussions with them.

	Title	Interview Duration	Method	Date	Location
Interviewee 1	BI Analyst	44:49	In person	14.12.2020	Helsinki, Finland
Interviewee 2	Professor	49:40	In person	15.12.2020	Vantaa, Finland
Interviewee 3	Trainee	30:27	On phone	5.1.2021	Remotely
Interviewee 4	Assistant	33:46	On phone	7.1.2021	Remotely
Interviewee 5	Sales Associate	30:15	On phone	7.1.2021	Remotely

Table 1: Interviewees.

3.1.3 Ethics

As Saldana et al. (2011) discuss, researchers have a responsibility to ensure ethical treatment and care of the people involved in the study. Eriksson and Kovalainen (2008) list that some of the most common ethical concerns in a research process are informed consent, privacy, and confidentiality. These issues were taken into account during the research process. Firstly, the interviewees were informed about the nature of the research and the fact that the interviews were recorded and later transcribed, and they were also told that they have the right to withdraw from the study if they wanted to (i.e., they were not required to participate). Furthermore, the interviewees were assured that they remain anonymous regarding factors such as their names and the companies they work / were working at. The interviewees were told that the all the information they disclose during the interview can be discussed in the thesis, which will be available online, but the anonymity will be guaranteed.

Furthermore, several procedures were conducted to ensure the anonymity of the interviewees. No irrelevant information about the interviewees was collected. During the recording of the interviews, no questions about personal information were asked. When transcribing the interviews, every piece of information that could lead to identifying the interviewees was anonymized. The data files were also named in an anonymous way and stored in secure places. The recordings were deleted once the analysis was done.

3.2 Data Analysis

For the analysis, thematic analysis was used. According to Boyatzis (1998), thematic analysis is "a process for encoding qualitative information". The method was chosen due to its flexibility and suitability to report meanings and experiences of interviewees (Braun & Clarke, 2006). It finds patterns in the information, and the themes are often coded. In this study, the themes and the codes for them are generated both deductively from the existing literature and theories, and inductively from the raw information of the interviews (Boyatzis, 1998; Braun & Clarke, 2006). The codes will be discussed and examined throughout the Findings section of the study. Overall, this study combines both inductive and deductive approach. It is deductive in the sense that the theoretical background was collected first, and then the method of pattern matching was partly used (e.g. Yin, 2003; Saunders, 2007). However, inductive methods were used as well, as a level of analytic induction was used to explore the specific phenomenon of COVID-19 pandemic (ibid.). As mentioned earlier, the interviews were transcribed. These transcripts were mainly analysed in Microsoft Word, where relevant terms, themes, codes, and topics were colour coded and eventually, the recognized codes were assembled from each interview. Due to the relatively small sample, the material was rather confined, which made it possible to process and analyse it in a manual manner in Word.

3.3 Credibility

This section discusses the credibility of the study and its findings, which speaks to the quality and truthfulness of the study (e.g. Saunders, 2007). Generally, the credibility of research can be measured by two factors: validity and reliability (e.g. Saunders et al., 2007; Eriksson & Kovalainen, 2008). According to Yin (2003), the criteria for judging the validity can be divided even further. He lists that the three aspects of validity are construct validity, internal validity and external validity. However, it is notable that internal validity is only applicable for case studies that examine causal statements, which this study is not. Therefore, internal validity is not discussed, but construct validity, external validity and reliability are discussed in the following.

In order to check the construct validity, Yin (2003) lists three methods are available: using multiple sources of evidence, establishing chain of evidence, and having key informants review draft case study report. Two of these methods were applied in this study.

Firstly, the concepts of multiple sources of evidence and triangulation were used to validate the study. According to these two principles, the results of a study are more reliable if the information can be found from several different sources (e.g., interviews, documents and archival records) (e.g. Yin, 2003; Saldana, 2011). Generally, the information should be found from at least three different sources, in which case the method of enhancing the trustworthiness of the study is called triangulation (ibid.). As this study includes material from interviews, academic texts and relevant news articles, reliability of this study was enhanced with the number of sources of evidence. Secondly, Yin (2003) emphasizes establishing a chain of evidence. As mentioned earlier, this was established by recording the interviews and transcribing them to ensure that the information chain remained intact. The third method, having key informants review draft report, was not employed in this study. While it may increase the construct validity as the interviewees could check the transcripts of their interviews (ibid.), contradictory research exists as well. Saunders (2007) points out that if interviewees are approached with validity check, the interviewees are likely to correct the transcripts, which is why conducting this procedure needs to be carefully evaluated.

When conducting a case study, external validity has been a general topic of issues and discussion, because external validity refers to whether the results can be applied on a general level (Yin, 2003). However, as defined earlier, the value of case studies comes from the in-depth examination of a unit, rather than broad generalization on the topic (Saldana et al., 2011). In case studies, the aim is to achieve analytical generalization by generalizing specific results to a broader theory, rather than generating statistical generalization (Yin, 2003). Thus, the results of this study can be generalized in terms of the broader theory, but not in terms of a broader population because of the limited sample size.

The reliability concerns whether the same results would be achieved from a different investigator, i.e. the extent to repeated trials would achieve the same results (Yin, 2003; Eriksson and Kovalainen, 2008). Furthermore, Saunders (2007) suggests that the process of analysing and interpreting raw data should be made as transparent as possible. The methodology of this research is available in this section, and an effort has been made to ensure that the steps of this research are as operational as possible, which allows any investigator to repeat the same procedures. The method of analysing the raw data is also further expanded in the Findings section of the study. However, the context of the study needs to be taken into account: the study was conducted during a very unusual time where the situation about the pandemic and its implications were still taking place and fluctuating

at a rather rapid pace. Thus, if the study was to be repeated during a different time in a different environment, the results could vary accordingly.

4 Findings

The interviewees are referred to numerically – Interviewee 1, Interviewee 2, and so on. More specific information on the interviewees can be found from Table 1.

4.1 The Analysis

The analysis is structured thematically, as opposed to structuring it by the interviewee. The broader discussed themes are the following: general thoughts regarding remote work, support for remote work, social aspect, technological aspect, and technical support. Some of these themes have some overlaps, in which case the finding is placed in the section which was found to be more suitable. Within these sections, the structure is chronological in relation to the case of the COVID-19 pandemic as much as possible, i.e. firstly the initial thoughts are analysed, then the thoughts about the everything happening during the pandemic and lastly, the ways the interviewees had changed their mind on topics.

Firstly, a notable finding is that finding interviewees for the study proved to be difficult, which is why the sample was smaller than initially wanted. Generally, people were divided into two groups – people, who worked remotely and had already been rather comfortable with the communication technologies, or people who just did not work remotely. Therefore, finding suitable interviewees within the time frame of the study was difficult. Secondly, it is important to note that the interviewees were chosen because of their bias towards technologies.

4.1.1 General Thoughts Regarding Remote Work

Nearly all interviewees expressed negative and/or sceptical initial thoughts about the enforced remote work. All interviewees agreed on the fact that initially, they expected the remote work period to not feel normal. Interviewee 1 said that he was feeling slightly suspicious about the outcomes of the remote work period and how well working would go. This was echoed by Interviewee 4, who said that the initial information about the enforced remote work was stressful for variety of reasons, like the lack of communication and the fast pace of technology adaption.

> *"In the beginning, the feelings I had (about remote work) were slightly negative, as I was used to - - dealing with things face-to-face with co-workers. And to overall work in the traditional way at the office." Interviewee 1*

> *"When this situation that has been going on properly started, so to speak, somehow I immediately got the impression that it will not feel normal." Interviewee 3*
> *"I found [the information about having to start working remotely] very stressful." Interviewee 4*

Interviewee 2 and Interviewee 3 also noted that as there was nothing that could be done about the situation, they accepted it for what it was. Interviewee 2 stated that there was no choice but to start doing what was possible and expand on the remote teaching.

> *"The viewpoint obviously had to start from the fact that there was nothing that could have been done about the situation - - so you had to adapt to the situation." Interviewee 2*
> *"It is kind of like, there's nothing that can be done about this situation, so you just have to go with what is available, so to speak." Interviewee 3.*

After the very initial thoughts, interviewees commented on the way they started to adapt to the situation in the beginning. Many factors affected the adaptation process. Firstly, the interviewees found that the nature of their job affected the results and the suitability of remote work. Generally, the interviewees with more independent jobs found the adaptation process easier. Especially Interviewee 1, Interviewee 2 and Interviewee 5 found their jobs to be rather independent, and they found that the independent nature of their jobs made the jobs quite suitable for remote work, whether they personally enjoyed remote work or not. When talking about how well Interviewee 5 adapted to working from home, she said: "I think I adapted to it quite well. I was mentally prepared to it and it was not a bigger shock than I had thought it would be."

> *"Working in our team is rather independent, and the work is mostly done independently, so it adapted to remote work rather well per se." Interviewee 1*
> *"Maybe the fact that the [job] is quite simple, like as long as we have our devices, the job can practically be done from anywhere." Interviewee 5*

On the opposite side, Interviewee 3 found his job to be somewhat unsuitable for remote work. His job required more teamwork and included more concrete tasks, which is why he found difficulties in fully adapting to remote work.

> *"It arguably depends on what kind of work is done. For me, it is very difficult for these kind of technologies to achieve the same results for working and the quality of the work as it would be if it was done in person. There should be rather advanced technology for that and it would probably be quite expensive." Interviewee 3.*

The remote work also affected the way interviewees were doing their job. Interviewee 2, a professor, noted his usual teaching materials were not perfectly suitable for remote teaching. He said that the shift to remote work required him to do extra work with the teaching materials, saying: "For full-time students, I had to modify the materials to something that would be suitable as a remote teaching material, and therefore you had to add some elements and rethink and use different communication methods…" He also said that the way he thought was very different remotely in a sense that it was more difficult to make jokes or more light-hearted notions, summarizing that "remote teaching is all facts and no fun". However, he also added that the effectiveness is focused on how the material is structured and emphasized, and how it is presented. Interviewee 4 had a similar experience, and she talked about the tasks, like training of new employees, that became very different during the remote work period.

When discussing the eventual thoughts Interviewee 1 had on remote work, he concluded:

> *"The feeling is just not the same, you cannot manage things as well remotely as face-to-face." Interviewee 1.*

4.1.2 General Support for Remote Work

This section discusses the more general support that interviewees had due to the remote work period. The level of support varied from interviewee to interviewee. Some had great amount of support, some moderate amount of support and some barely any support at all.

> *"There were so much [instructions on remote work] that nobody probably even bothered to read it all" - - I think that the employer handled it very well in my opinion.". Interviewee 1.*

Interviewee 1 said that there was a lot of instructions about remote work, and he was happy about the effort his employer had put to the transition from normal work to remote work, saying: "I felt like the firm was quite ready to transform to the remote work dynamic, so that there was no complains about that".

Interviewee 3 found that the importance of scheduling was emphasized during the remote work period, noting that it was extremely important for everyone to be on the same page about the schedule and deadlines. The employer handled this aspect very well in his opinion, as well as the more general instructions about the remote work practises.

Interviewee 2 expressed that his employer did not provide the employees with any specific instructions. However, he did not find it to be a problem. According to him, the employees were mainly long-time employees who were expected to be able to handle the situation.

> *"I guess you should have asked yourself if you felt the need to have some sort of training or anything like that." Interviewee 2*

Interviewee 5 had a similar experience. She noted that she only started working at the company after the company had initially moved to remote-heavy work, so she did not know whether or not the company had had some sort of instructions in the beginning, but she said that she did not receive any instructions. However, she felt similarly to Interviewee 2, as she felt like it was not an issue due to the simplicity of her job.

4.1.3 Organizational Aspect

Firstly, all interviewees indicated that they find their productivity to be somewhat worse during the enforced remote work.

> *"I would say that productivity decreased slightly, not dramatically by any means but to some extent." Interviewee 1.*
>
> *"Some things are left hidden and obviously, if you think about that in terms of the teaching outcomes, it is negative." Interviewee 2.*
>
> *"I don't believe that my outcomes were the same as they would have been if I had worked normally for this time. It had an negative effect." Interviewee 3.*
>
> *"At the end of the day, I find myself to be more productive when I'm at the office." Interviewee 4.*
>
> *"When you hear that other people are working around you and there [at the office] is somehow a different feeling, I felt like 'oh wow, I really want to work effectively', but I still think that I'm almost as productive at home as well." Interviewee 5.*

The most commonly mentioned reason for unproductivity was the inability to reach co-workers as quickly as in a normal setting, as noted by Interviewee 1, Interviewee 4 and Interviewee 5.

> *"You cannot go to your co-workers to ask about things, tell them about things as quickly and as easily." Interviewee 1.*

> *"I feel like I'm more productive at the office, because it is much easier just to, for example, ask for help from someone else, and the communication flows naturally when the people are in the same space as you are." Interviewee 4.*

Another productivity issue related to technologies was the distracting nature of instant messaging. Interviewee 4 said that sending messages in a chat is easy but creates distractions. Interviewee 5 echoed this, saying that she ended up muting the chat because the continuous notifications were distracting. She continued by pondering that at the office, certain conversations can be more easily discussed between just a few people, rather than sharing it to everyone, which can be distracting.

> *"Even if you had an unfinished task, you were supposed to be working, but once I saw what was in the message, I got the feeling that 'okay, this is not necessarily even relevant for me or anything that important, but I still want to read this'. And then you got stuck browsing through the conversation. In a sense, [Teams] even slowed my work down." Interviewee 5.*

Interviewee 4 thought that Teams meetings can take longer than live meetings, and she thought that it may result in employees "doing two things at the same time". Therefore, employees would not have a full focus on the meeting due to the distractions caused by other tasks.

Interviewee 2 found that the productivity is difficult to measure. However, he noted that, as he is a teacher, the teaching became less versatile and many things were left unsaid, and he supposed that the students might therefore not have gotten as good of a learning experience as they would have in person. He said that discussing and handling questions and obscurities is easier in person. Furthermore, he wondered whether the productivity was affected by the fact that he was unable to "read the room", like he would in a live situation, and therefore unable to adjust his teaching based on the situation.

In addition, Interviewee 3 and Interviewee 4 noted that their work motivation was not as high when they worked from home. Interviewee 3 said that had he been able to motivate himself as well as in the live situation, his productivity could have been close to the live situation – but even still he did not believe that his work would have met the same standard. Similarly, Interviewee 3, Interviewee 4 and Interviewee 5 indicated that their preference to work from the office might have had a negative effect on their remote work productivity.

In addition to these factors, Interviewee 1 briefly mentioned that dealing with the home environment and having technical difficulties affected his productivity negatively. However,

the technical difficulties will be discussed more in depth in the section about technical aspect of the findings.

Interviewees also found some positive aspects to their productivity, but these aspects were significantly less represented in the interviews. Interviewee 4 said that in the beginning, she felt like her productivity might have been better due to the fact that home environment had less distractions. Interviewee 5 noted that she thought herself to be almost as effective remotely as she would be at the office, and she linked the similar level of productivity to the fact that her salary was partly commission-based.

Secondly, Interviewee 2, Interviewee 4 and Interviewee 5 believed that the situation will leave some sort of lasting effects for the workplace habits in the future. Interviewee 2 said that something will probably stick and some things will most likely change, but he also said that time will show which things will be the ones to be affected long-term. Interviewee 5 stated that she does not believe that things regarding remote work will not go back to fully normal ever again. She was interested to see what is going to happen in the future. From more personal point of view, Interviewee 4 said that she is likely to have a remote work day every now and then even after the enforced remote work period is over, though she also said that see is really looking forward to getting back to the office.

Thirdly, feedback was brought up by Interviewee 4. She returned to the topic right after the formal interview, stating that she forgot to bring it up during the interview. According to her, both giving and receiving feedback has been an issue throughout the remote work period. She said that se did not feel comfortable giving feedback in writing due to the risk of being misunderstood, and she also had not received much feedback during the remote work period.

Interviewee 5 was asked about her views on feedback during her interview. Her views echoed the views of Interviewee 4. When the topic of feedback was brought up, she referred to it as “absolutely one of the biggest challenges [in remote work]”. According to her, there is nothing that can substitute to the indirect feedback that comes from the general feeling of “what kind of a feeling you get about how you are perceived in the work community”. She expressed satisfaction over the fact that she had had a discussion on her performance with her manager, because she was able to get feedback in that way.

> *“Of course you can read between the lines, and we also have the commission-based salary where the manager wrote a note regarding your performance, so you have an idea about how you’re doing. But there’s no direct feedback, and I find that to be one of the biggest challenges, especially as a new employee.” Interviewee 5.*

Fourthly, Interviewee 5 suggested that remote work can have negative long-term effects for the commitment that employees feel for the company.

> *"In the long term, it increases that kind of, what is the opposite of commitment, non-commitment, or the feeling of detachment, when you feel like you are working hard alone and you don't even really know what for." Interviewee 5.*

4.1.4 Social Aspect

Initially, some of the interviewees had suspicions about whether or not the social aspect of the work would actualize.

> *"Before this enforced remote work streak, I had a thought that yes, communicating with my co-workers will weaken with, for instance, my teammates." Interviewee 1.*

The suspicions were found to be correct among interviewees because in most interviews, the social aspect (or lack thereof) was one of the first issues to arise. Four out of five interviewees found the social aspect to be lacking, in both work-related issues and more informal encounters at work.

> *"You noticed quite quickly that you immediately lose some of that sort of sense of community, or working in a team. It is not alike at all to work on things with several people on the phone, for example, than it is to work on them in person. In a sense, you can get things done, but I feel like in some cases, some things like the end results etc. may suffer from the fact that there is no interaction and you cannot get the same connection." Interviewee 3.*
>
> *"Many things were left untold. That kind of, it is related but also just common knowledge or practical experience or something like that, that kind of things are decreased. And they are in a way more light-hearted and kind of ease and lighten the study situation, if you have those things in your back pocket and they are natural to present live. When, instead, they can be very tiring if they are presented through these kinds of communication technologies where the so-called situation comedy is lost." Interviewee 2.*
>
> *"First off, I'm an extrovert by nature, so it is nicer to see people in person and communicate in a way where the person is actually next to me. So of course, shifting to remote work it was slightly odd that, especially since we did not have videos on in the beginning, you couldn't see the other people." Interviewee 4*

However, one of the interviewees seemed to be unbothered by the lack of social aspect. He commented on the different types of personalities people have, saying that he was completely content working alone.

> *"It is clear that there are many types of people. - - I just happened to experience it in a way that, probably related to my background and other things, I just wasn't really bothered by the fact that I was alone. Obviously, if there had been situations where I would have needed some kind of specialist help for something, then it would have been a problem, but when not needed, my sort of personality traits are the type where I'm just content [working alone]. However, I know that many people experienced it to be very bothersome that they had to be alone doing things and there was no one to accompany them." Interviewee 2.*

Starting off with the more formal aspect of social interaction at work, the amount of teamwork affected how interviewees experienced the social connectivity. The level of teamwork required by the interviewees' jobs varied. Interviewee 2 reported his job to be extremely independent, Interviewee 1 and Interviewee 5 reported their jobs to be rather independent, and Interviewee 3 and Interviewee 4 reported their jobs to be more social.

Interviewee 1 evaluated that his job is "60/70 per cent independent work and 30/40 per cent requiring social interaction". Thus, he noted that his job was rather suitable for remote work. However, for the part requiring teamwork, he said that even then, issues regarding communication and technology affected his job. Thus, he suggested that for jobs with more social interaction, the situation might have been more difficult.

The implications that remote work had on the social aspect were also dependent on the individual task or the kind of work that needed to be conducted. Interviewee 3 said that when the matters were something that "only required discussion", they could be gotten done almost as well as in person. On the other hand, he said that when the team needed to do something more physical or concrete, the remote situation did not compare to the live option. This was echoed by Interviewee 4. She explained that a part of her job was briefing and training new employees, and this aspect of her job had taken much more time remotely than it would have in person.

Another factor in the social connectivity and the success of the remote teamwork was found to be the other counterparties. Interviewee 3 noted that with some people, remote teamwork was more successful than with others. He said that with some co-workers, working remotely may lead to a situation where instead of truly working together, everyone just does their part individually and then the end result turns out to be incohesive. He

pondered that the results may be affected by how well each person in the team has adapted to working remotely.

Overall, many issues were found in interactions that would be simple in person. For instance, asking for help was found to be significantly more difficult by several interviewees. Interviewee 4 said that sometimes she did not ask about certain things purely because the threshold for sending a message was higher than asking a person next to you at the office.

> *"It is very difficult to ask for help. - - It really does take a lot of time to ask a quick question by writing a message, so it felt very challenging in the beginning." Interviewee 4.*

Interviewee 1 and Interviewee 5 agreed with this, both stating that asking for help was significantly more difficult when working remotely. Interviewee 5 said that it takes longer to receive help when it is not an option to walk to a co-worker to ask, and Interviewee 1 found that the difficulty with receiving help hindered his productivity.

The lack of social interaction led to substitutive measures, and examples of instant messaging and online meetings were brought up by the interviewees. Interviewee 4 found that the remote setting increased instant messaging a lot. She said that although it is easy to just send a message in a chat, it might not be that enjoyable for the receiving party since the instant messages keep distracting them from their work.

Similarly, Interviewee 1 said that meetings were sometimes an issue. According to him, it was difficult to schedule meetings, especially one-on-one meetings. As he phrased it:

> *"It was slightly more difficult to schedule [the meetings] because you couldn't just walk to the other person to ask whether we can go and have a chat, or when could you do it – instead, you had to send these email or Teams invitations, which caused some stiffness. Sometimes it felt like some chatting sessions were left unheld and questions unanswered." Interviewee 1.*

Interviewee 2 echoed this, as he noted that sometimes scheduling lectures was an issue. According to him, choosing the materials from the vast amount of information was more difficult remotely, because it was impossible to see which things were found difficult by the students.

> *"The biggest issue was the scheduling." Interviewee 2.*

Interviewee 2 noted that "when you know how to use the technology, you can express a specific, singular thing", but the different kinds of nuances and other similar things are left unnoticed. He also said that in a Skype call, the live situation is not the same – things that are obvious in person are not noticed because they are left either unspoken or unnoticed.

The informal side of social interactions was found to be lacking by most interviewees as well. Interviewee 4 said that a big part of her job is chatting with co-workers and the workplace, and remote work has taken away this aspect. She said that she is missing this more informal social aspect with her co-workers.

Three of the interviewees, Interviewee 1, Interviewee 4 and Interviewee 5, reported that the firms they work at, or the teams they worked in, arranged some sort of informal meetings. All three found these informal meetings to be rather positive.

> *"Every day in our team, we had this kind of a, about half-an-hour, coffee meeting, where we had a video call with the team and the manager. - - We chatted about this and that, mainly about non-work related things. It was kind of a refreshment in the middle of the day, refreshing and a nice practise." Interviewee 1.*

However, despite enjoying these informal meetings, Interviewee 4 and Interviewee 5 did not find these meetings to be a sufficient social occurrence. Interviewee 4 said that remote work lacks the opportunity to chat with co-workers who are not in her closest circle, which has a negative effect on the sense of community. Similarly, Interviewee 5 said that their informal meetings happened weekly, and it included the team and the manager. While she liked the practice, she found some issues with it. She said that everyone "kind of comes and goes, and some don't even say anything". She noted that as a new employee, the weekly informal coffee moments did not feel natural for her.

> *"I don't think [Teams] substitutes for the social interaction. Even if you have video on in Teams and some sort of a coffee moment, I still don't think it is the same as being at the office." Interviewee 4.*
>
> *"It did not feel natural to begin introducing yourself and chatting there, because you have never even seen these people before. But for the people who have worked there for a longer time and who know each other, it must be a nice thing." Interviewee 5.*

Interviewee 5 brought up breaks and how the remote work affected the social aspect of them.

> *"Breaks – lunch breaks, coffee breaks – it is a completely different thing when you are working remotely. I obviously leave my computer then, ergo I leave Teams and these connections through which I could be in contact with my co-workers. I just sit down somewhere alone to eat and have a break. It would be fully different at the office, I would see my co-workers there." Interviewee 5.*

However, positive measures of informal communication were found as well. Interviewee 5 found that the group chat they had with their team was a positive surprise that

"perhaps saved this whole thing". She said that despite being a new employee, she was able to gain some sort of a connection to others through the chat. While she did not always receive help or answers through the chat, it was a positive surprise.

The social aspect caused extra difficulties for interviewees who had not worked for the companies for a long time. Interviewee 4 and Interviewee 5 said that as they were (relatively) new employees when being assigned to remote work, the combination of a new workplace and a sudden enforced remote work was rather challenging.

> *"Back then, I was still a new employee in the company, so my tasks were not yet as clear at that point, so I think that all that [asking for help] becomes to much more difficult." Interviewee 4.*
>
> *"It [starting to work remotely] felt quit frantic, because I had only just started my job, and just that in itself made me wonder how well the working will go as I hadn't yet learned the tasks that well. - - It felt a bit weird that I hadn't even had time to get into the work community before I already had to start working remotely." Interviewee 5*

Interviewee 5 also said that the reason she felt like she was not yet a part of the work community was the fact that she had not seen most of her co-workers face-to-face. She, however, mentioned that she had a friend who already worked at the company, which made the situation easier for her as she could send her friend messages with a "lower threshold".

In comparison, Interviewee 2 found that having worked with the same people for a long time, remote work was easier because everyone knew everyone and their ways of working.

> *"Because everyone was familiar with each other, usually in these kinds of communities, in the middle of a semester, everyone knew who everyone is. It is easier then. But it could be more difficult, obviously, if it was a fully foreign environment, if there were many people who you hadn't worked with otherwise. Something like this were people already know what everyone does an thinks, or how they react, tt is a lot of easier to do remote work than it is if everyone is completely unfamiliar with each other." Interviewee 2.*

Interviewees had differing views on the effects that remote work had on their work-life balance. Interviewee 1 found that working from home environment created some challenges, which might have hindered the results of remote work, whereas Interviewee 4 found that remote work can have positive effects for the work-life balance.

> *"Once you got used to the video calls and learned how to use them, the threshold for participating in the meetings from home has become lower. - - It makes your personal*

> *life a bit easier. If you sometimes have something planned after work, and you want to go there straight from home, you can participate in the meeting from home. It makes it easier." Interviewee 4*

Despite different issues, Interviewee 4 said that the social aspect still actualized more than she had thought. She had not thought about the possibility of things like remote coffee meetings. These thoughts were echoed by Interviewee 5, who said that she was positively surprised by a group chat for their team, which helped them to communicate frequently and often.

> *"I thought that there would be even less [social interaction], that everyone would just be home alone and there would be just work requests via email and nothing else. So yes, I think that [it actualized] better than I initially thought." Interviewee 4.*

Yet, both still concluded that they were looking forward to being able to start working at the office again.

> *"The main point is that social in-person contacts cannot be beat." Interviewee 5.*

4.1.5 Technology

Firstly, it is relevant to discuss the technologies that the interviewees identified. The most commonly used communication technology was Microsoft Teams, which was used by four out of five interviewees. In addition, Adobe Connect was used by two interviewees, Skype or Skype for Business by two interviewees, and Slack by one interviewee. Also, emails were mentioned by all interviewees. Also, one of the interviewees, who was a teacher, identified a platform called Moodle to be a significant communication platform regarding communicating with his students. In his profession, this communication method was significant as he was able to send messages, communicate about schedule, and add other kind of relevant information through the platform, even though the mentioned platform did not allow any sort of in-person communication. Another one of the interviewees identified the intranet of their company to be a relevant communication channel, and one mentioned a VPN.

However, this study focuses on the communication technologies that have features for direct communication, hence the focus will be on Microsoft Teams, Adobe Connect, Skype and Slack.

The interviewees either had not used the technologies at all, or had only used them a few times.

> *"With Teams, I have had a couple of times I have used it; before this [remote work period] I had a job interview via it." Interviewee 3.*
> *"[Teams] was not that familiar to me, I hadn't basically used it at all before this remote work period. So it has only now become a part of my daily work life." Interviewee 4.*

Furthermore, the interviewees generally thought that the equipment (i.e. physical devices) they had, both personal and provided by the employer, were sufficient for the remote work. The only exception was Interviewee 1, who wished that the employer had been more flexible about letting employees take equipment home with them. He especially wished that the employer had been more flexible with employees taking out external screens, because he thought that one extra external screen would have helped him to work better. In comparison, the possibility for taking external screens from the office was appreciated by Interviewee 4, who said that she was able to take one home. But generally, the interviewees found the equipment to be sufficient.

> *"You can get by with quite a little of technology." Interviewee 2.*

Otherwise, the only issues interviewees had with their devices were general issues regarding topics such as microphone and web camera quality. However, none of the interviewees found these issues to be anything insuperable, and therefore, all interviewees expressed that the equipment was generally of quality in regard to their jobs.

The following will discuss the thoughts interviewees had on the communication technologies they used. The segment is, perhaps more clearly than the previous segments, divided into three parts: the initial thoughts when the remote work period started, the beginning stages of adaptation, and the time period after the very beginning.

Initially, the sudden, enforced and daily use of communication technologies caused worries in the interviewees.

> *"It felt slightly worrying how I would adapt to using this new tool, especially in this kind of a forced situation where you need to learn how to use it immediately." Interviewee 1.*
> *"I had quite a strong suspicion that problems would arise because with technologies, there are always some sort of technologies, even in normal situations, and now that even every other firm moved to remote work at the same time, I thought that there might be problems with servers of, for example, Skype and Teams and so on." Interviewee 1*

> *"You could initially think that it does not compare to the live situation because something is sort of left unsaid or uninterpreted, something that you could normally see with just one glance in person." Interviewee 2.*
>
> *"For AC, it was more like 'does it work as well' and 'are there any bigger issues, as I had never used it before I wondered whether things could be done normally with it." Interviewee 3.*
>
> *"It was stressful in a sense that you had to learn how to use these new technologies in a fairly quick space, for example Teams was not that familiar to me beforehand" Interviewee 4*
>
> *"I had quite neutral feelings, or no, perhaps more negative-leaning. - - They [technologies] lack the interaction and seeing face-to-face." Interviewee 5.*

Interviewee 1 said that he had initially been sceptical about the different functions of Teams, like whether file sharing had issues or video calls would have quality problems. He felt "unsure" and "almost worried" about adapting new technologies in the beginning. This was echoed by Interviewee 4, who said that she did not really know how to use Teams, let alone features such as file sharing, and therefore found the initial situation to be challenging. Interviewee 2, who had used Adobe Connect a few times before, noted:

> *"It was for both, [the students] and the lecturer, a rather new thing. While using the technology was partly familiar from the past, enacting the whole material full-time was the thing that needed to be shaped and modified. - - And how to utilize the material was the problem that needed to be solved somehow."*

Trust played a role in the initial perceptions on the communication technologies, especially for Interviewee 1, who brought trust up several times during the interviews. He said that he had usually had trust in tools provided by Microsoft, which is why he initially thought that Microsoft Teams cannot be "absolutely horrible" either. However, he still stated that his trust in the new technology was not solid.

> *"Of course, obviously if you have an international name like Microsoft behind the product, the trust is automatically increased in comparison to a product that is brought by a producer who is someone you have never heard of before." Interviewee 1.*

After the very initial, generally doubtful, stage, the interviewees began using the technologies. They had contradicting feelings about how the very beginning of the transformation and the first stages of adaption went. Some interviewees found some issues with the adaptation in the beginning.

> *"At first, there was perhaps some rigidity, getting used to those technologies, especially to Slack and Teams, and the overall new way of working where you cannot just go to someone to ask about things, but you have to write to the chat or have a phone call." Interviewee 1.*
>
> *"In the beginning, the AC lecture thing felt, for some reason, quite factitious." Interviewee 2*

Also, Interviewee 2 decided to stick with the more traditional remote work technologies, stating that "I did not stray to the line where I would have used some social media channels for these". Instead, the claimed to have intensely used the three communication channels (email, Moodle and Adobe Connect) for the courses he had during the remote work period. Interviewee 4 also had some issues, stating that learning how to use the technologies really made working more difficult for her in the beginning. She found the adaptation process to be hard for her.

> *"In a sense, I found it rather difficult. Just doing basic things, like I probably could not even share screen in Teams when we moved to working remotely, so in that sense it really made working more difficult in the beginning." Interviewee 4.*

However, for some interviewees, the adaptation went rather smoothly.

> *"I felt like it [adoption process] went quite well - - whenever needed, I felt like it worked quite well and [the technologies] felt rather easy to use as long as you were given instructions. So for me, adapting the technologies went quite well, it started rolling quite well for me." Interviewee 3.*

Even Interviewee 4, who found the beginning stages to be very difficult, found positive aspects. She claimed that she was even slightly surprised about the fact that the different features of Teams were "thought through" so well, as long as she understood to look for them and learned how to use them. Similarly, Interviewee 5 was surprised about how well the group chat function of Teams worked.

While most interviewees experienced some difficulties in the beginning, eventually, each of them found the technologies to work relatively well.

> *"It eventually got moving, you learned how to use them and felt like you could work with them, even though perhaps not as well as in person." Interviewee 1.*
>
> *"If you hadn't used any kind of communication technologies like that, [the effect on productivity] would have obviously been negative. So in a way, it was positive that there was something that could be used." Interviewee 3.*

> *"Once you learned how to use [the technologies] better, the everyday work became a bit easier." Interviewee 4*
> *"I see it as better than nothing, and it is arguably the best option in this situation in which working remotely is inevitable." Interviewee 5.*

Interviewee 1 noted that while Teams and Slack had some issues, using them ended up being easier than he had expected, and eventually, he described Teams' video call feature as "very good". However, he also indicated that his initial suspicions about Skype for Business turned out to be true in his opinion, as he did not enjoy using it.

Overall, Microsoft Teams, which was used by four interviewees, was found to be relatively good substitute for in-person communication. Interviewee 5 said that while Teams was not as fast as talking in person, it is still relatively fast, especially compared to email.

> *"Microsoft Teams was probably the best one out of these remote work technologies to support social interaction. It by no means replaces physical presence and working face-to-face, but it perhaps answered to the need the best." Interviewee 1*

However, despite the general consensus among the interviewees that using the technologies became easier as time went by, they also agreed on the fact that the technologies did not compare to the live situation. Interviewee 2 said that the communication technologies used should have more versatile ways of interaction in order to compare to live situations. He discussed how for a lecturer, the attributes that can be brought out in a live situation are not the same as via a technology. The examples he gave were the ability to write things on a white board freely to, for instance, draw flow charts. This, in his opinion, took away from the participant, because the participant could not be a part of what the lecturer would "happily present as a support for the speech and texts". He believed that there could have been better technologies already available for his job, but that he was not yet knowledgeable enough to talk about them or to propose using them at his workplace.

Continuing with similar views, Interviewee 4 said that she still had conflicted thoughts on the matter, because even though it was good to have something that enabled work from home, she felt that it just did not compare to the live situation or talking with someone in person. She compared Teams to be a "band aid" for the situation. Interviewee 5 had a very similar view, saying that she found Teams to be comparable to any communication technology – it does its job but it lacks the interaction and face-to-face communication, which makes it incomparable to the live situation.

Interviewee 2 had many thoughts about the social aspect of using communication technologies. He debated the effectiveness of Adobe Connect, wondering whether the

signed-in students were actually listening and participating in the lecture that was going on. While these Adobe Connect (or AC) lectures were similar to the in-person lectures, Interviewee 2 found that they were mainly to showcase specific topics like a calculation rather than have a traditional lecture.

> *"It was unclear how real the participation was. Although someone signs in and gets kind of signed in for the lecture, or for the happening or the event, it is no guarantee that they are actually participating in it. Because the information flow and the outlook flow does not work in a way where you could be present the way you normally are face-to-face." Interviewee 2.*

Interviewee 2 talked about how, in remote situation, the responsibility falls more on the receiver. "It is kind of how much the person wants to invest in the matter at that point, and the person might have many other things on mind as well." However, he also noted that as the responsibility is more on the other side, it is necessary to believe that "I have done what I can" and be happy with that. He brought up the fact that in Adobe Connect, participants had the possibility to ask questions in the chat, and the topics could then be discussed if the participants were unsure about something.

Communication technologies were found to have some impacts on productivity. Interviewee 1 noted that if used in support of the daily work at the office, the communication technologies such as Teams can even boost productivity, but not if all the daily communication is reliant on them. He even said that "my expectations might have been even too negative about this". However, both Interviewee 1 and Interviewee 2 agreed that the productivity is dependent on the situation, and sometimes the communication tools and decrease it, and sometimes not. Interviewee 3 said that in terms of productivity, the communication technologies brought nothing extra to his working, but it did not hinder it either.

One significant issue found by interviewees was the fact that sometimes, there are too many channels of communication, or too much information flow.

> *"If you have six different channels that are posted with stuff, people aren't necessarily bothered to read them all, and then, some people aren't receiving all messages because of that." Interviewee 1*

Interviewee 5 mentioned that she had muted the group chat, which was the preliminary communication channel, saying that it was often so filled with new messages that it was distracting her from her work. She wondered how many other people might have done the

same, and noted that if many people do it, it might affect the information flow and how quickly people receive messages.

Some interviewees also had technical issues even after the difficulties of the beginning were overcome. While the technologies often worked in the end, some issues came up throughout the use of technologies.

> *"I had [server problems] as an expectation, and to some extent, it actualized, but perhaps not to the same extent as I had thought." Interviewee 1.*
> *"There were always that kind of fiddles where you had to begin, it did not work for one reason or another and I had no idea why I didn't. But you just had to begin again, - - you just had to start over, like begin again, the problem came somewhere around where, as a countryman would say, 'shut things down and start all over again'." Interviewee 2.*

Interviewee 3 felt that it is extremely difficult to achieve the results he would want through technologies, or at least, "it should be quite advanced technology and it would probably be very expensive". He felt like even if some small enhancements were made to the current technologies, they would not compare to the live situation, and indicated that he would not continue using the technologies in his daily work. Interviewee 5 had a similar view – she said that once she is able to return to the office, she is likely to stop using Teams.

Some other suspicions also remained. Interviewee 4 brought up the fact that she had been contemplating the cyber security of Teams. According to her, her employer was very strict about information security. She did not fully trust the security of Teams, and was still unsure about how reliable Teams was in this aspect during the interview.

However, some interviewees found that their views on the technologies had become more positive throughout the remote work period. Interviewee 2 said that now, he has more trust in the technologies and how well he can work leveraging the technologies. He even noted that he is likely to continue using the communication technologies in the future, concluding that the technologies are suitable for certain situations, and he just needs to find the occasions were using remote work technologies is an effective way to handle things. Interviewee 4 echoed the aspect of trust, saying eventually, she was able to trust that the communication technologies worked despite her initial suspicions. She noted that she will probably use Teams every now and then even after the enforced remote work by participating in meetings from home.

4.1.6 Technical Support

All interviewees said that they had some sort of an IT support throughout the remote work period. However, during the remote work period, the level of IT support varied, even within workplaces and the different technologies. Whether or not the support was sufficient was dependent on both, the interviewee and the situation.

Some interviewees found that in the beginning, or even before the remote work period, the initial support for using the technologies was sufficient.

> *"Before the corona-spring, we had gotten Teams instructions and it was increased during the COVID-19 time, at least with Teams, and perhaps other tools as well." Interviewee 1.*

Interviewee 3 had similar experiences. He said that Teams and its functions were presented to the employees in the beginning so that they were able to see how the technology worked. He found that this was a good practise, as he noted that:

> *"It was not like we were just told which tool to use at what time, which would have probably been a worse way to approach the situation." Interviewee 3*

However, Interviewee 4 expressed to have had a less positive experience. She told that the employer did not provide the employees with much support regarding the adoption of the communication technologies. She said that she would have wished to have initial training and more support for using the technologies, but also understood that the situation was so sudden that some personal proactivity was necessary. The interviewee indicated that if she had received more support in the beginning, the initial adoption would have gone better.

> *"It was quite challenging since the firm did not provide us with a lot of instructions. Instead, we as assistants practically had to teach the rest of the personnel to use these tools. It was quite straining since I did not know how to use them either or find them to be that useful, and then I had to educate other people on how to use them. So no, there was not a lot of support from the employer for that matter." Interviewee 4.*

Receiving training from the employer was not found to be the only beneficial training. Several interviewees found that personally experimenting with the technologies was either useful, or in some cases, necessary. Interviewee 2 said that as the employer did not automatically offer any initial support, he experimented on the technologies to ensure that he knew how to use them and whether they worked properly. Similarly, Interviewee 3 found that it is useful to examine the technologies by yourself before actually using them. He said that learning about the features beforehand may eventually help to work more effectively,

because then, the "flow" of the work is not interrupted with figuring out how to use the technology. However, despite finding employees' own proactivity useful, Interviewee 3 said that having someone knowledgeable to help you in the beginning is ideal.

> *"What might seem like a small thing that can be done quickly can end up taking some time." Interviewee 3*

Also, the level of support after the very beginning varied, but all interviewees indicated that some kind of IT support was available.

> *"We had an outsourced IT support in India, or at least most of it, it was where the answers mostly came from. In Finland, there was just a little bit of support, the Finnish support was at the local office, so you couldn't really get a hold of it. - - The level of support [from India] was moderate, although it was not readily available and there where sometimes issues regarding communication with them" Interviewee 1.*

Overall, the speed of reply was found to be an issue. Every interviewee experienced some issues regarding how quickly they received help, at least to some extent. Interviewee 4 told that they knew who to contact if support was needed, but she found that getting help tended to take a long time. She noted that this slowed down the pace of her work. This was very different from the situation at the office, because the office had a physical place where to go when help was needed. However, she found that once she received help, it was sufficient.

> *"You get support, but it is not necessarily always available exactly when you need it." Interviewee 4.*

Interviewee 3 had somewhat similar experience. He explained that he did not personally have many occasions where he would have had to contact the IT support. However, he told that many of his co-workers had needed some help, and generally, they did not receive the support quickly enough, although Interviewee 3 also noted that the situations were generally the kind where the help would have been needed extremely quickly.

Similarly, Interviewee 1 said that one of the biggest barriers was the speed in which access rights were received, because it hindered the productivity.

> *"If you got to call [the Finnish end of IT-support], the advice was rather fast and functional. With the Indian end, the problem was that you had to connect via email, and they wouldn't probably reply to your emails in like once in two days, so the speed of reply would have had to be quicker, preferably at maximum half an hour." Interviewee 1.*

Interviewee 5 found that while the level of IT support was sufficient, there was an issue regarding available information on how to reach the support. While she had always eventually received support when needed, she had always had issues on finding the contact for the support, and she wished that the contact would be clearer.

> *"If I think that I'd have some kind of an IT problem, I'd have to, again, ask someone what I'm supposed to do in this situation. It is still not that clear to me who to contact." Interviewee 5*

In addition to the issues in reply time, Interviewee 1 found other issues as well. He emphasized the level of training of the support employees, and the importance of ensuring the language barrier not being an issue. According to him, these were the issues of an outsourced, foreign support, as it can easily result in language barriers. Furthermore, Interviewee 1 also noted that he wished there had been more instructions on the VPN the company used, as he claimed that he had several issues with the VPN regarding access, functionality and clarity. According to him, the company had used several different VPNs, and the clarity and transparency about the usage, practice and instructions on the VPN would have made the work more effective and productive.

However, despite some issues, all interviewees found the support to be generally good. Interviewee 2 said that they had a support person for Adobe Connect, who could have been reached through email or phone, and that he always got the answers he needed to solve a situation. Similarly, Interviewee 3 said that his co-workers who had needed some help, had eventually received the help they had needed. Interviewee 1 and Interviewee 4 said that while getting help often took a long time, eventually the given help was usually sufficient. Furthermore, Interviewee 4 told that in Autumn 2020, i.e. after several months of remote work, her employer introduced video tips for Teams in their intranet. She found this to be a good practice and the videos to be helpful. And finally, Interviewee 5 said that she had contacted the support several times and always received the help that she had needed.

5 Discussion

COVID-19 and its effects on the workforce have provided researchers with many opportunities. This section discusses the findings of the study, reflected with the existing research.

5.1 General Discussion

During the pandemic, the natural diffusion of innovations has been disrupted. Traditionally, remote work has usually been an active choice by employees (Anderson & Kelliher, 2020). Therefore, employees who are not comfortable with the communication technologies needed for telecommuting have had the option to work from the premises of the company. While this does not necessarily guarantee that the employees have been able to completely avoid communication technologies, it has decreased the need to use them. Now that, in many cases, everything has been done remotely during the pandemic, usage of the communication technologies has been unavoidable. Thus, employees have been dependent on remote work technologies, which has resulted in the technologies being in the centre of the pandemic (Madianou, 2020). This has arguably caused many gaps of coherence, i.e. discontinuities, within workplaces (Watson-Manheim et al., 2002).

As remote work has been enforced upon many workers during the COVID-19 pandemic, the conditions have been in support of the diffusion, even if workers were not likely to adapt the remote work technologies in terms of factors such as attitude and perception. In other words, the employees have had to adopt new technologies because an authority innovation-decision has been made, referring to the different innovation-decisions listed by Rogers (1962). The diffusion has been forced upon some workers, whether they were ready for it or not. The findings of the study imply that especially workers who would rather avoid the usage of communication technologies, i.e. late adopters, were not necessarily ready for the technology adoption so suddenly. According to Bouwman et al. (2005), technology adoption has four stages: adoption, implementation, use, and effects. The COVID-19 pandemic has speeded up the adoption and implementation phases, emphasized the use phase of the communication technologies, which now allows the effects phase to be examined.

The Finnish workforce is often considered to be advanced in technology knowledge (Business Finland, 2020; OECD, 2020). Perhaps the very first finding of this study supports

this – finding suitable interviewees, i.e. workers who both worked remotely and were relatively unfamiliar and/or suspicious towards communication technologies, proved to be more difficult than expected. This coincides with the article by Business Finland (2020), which claims that Finland has a good operational capability for the transformation to remote work. This was noted even by one of the participants of this study, who speculated that Finnish companies are well prepared for these kinds of shifts.

5.2 Adaptation of Late Adopters of Technology During COVID-19

The first research question of the thesis was the following:

1. How have Laggards (and/or Late Majority) adapted to the enforced remote work and the use of remote work technologies during the COVID-19 pandemic?

As discussed, the COVID-19 pandemic has forced many employees to work from home, which has made remote work technologies more prevalent than ever (e.g. Madianou, 2020; Ågerfalk et al., 2020). This disruption has quickened the pace of technology adaption, i.e. diffusion of technology innovations (McKinsey, 2020). While this has affected workers from all categories of technology adopters, the situation has arguably been the most challenging for employees who had not yet adopted the remote work technologies prior to the pandemic. In other words, Laggards and the last individuals in the Late Majority group. As Laggards have, by definition, a lengthy adoption process and suspicions towards new technologies, this kind of sudden, forced adoption process is likely to be difficult. This provided researchers a unique opportunity to examine the adaptation process of late adopters. Simultaneously, the insights gathered from the views of late adopters can be used as an advantage when investigating technology adoption and assessing organizations' activities and processes (Jahanmir & Lages, 2015; Belzunegui-Eraso & Erro-Garcés, 2020).

Now, it is notable that late technology adoption and remote work adaptation are not linked per se, considering that remote work is arguably not an innovation, at least when referring to the definitions introduced in the literature review. Therefore, no explicit implications for late adopters' remote work adaptation exist. Thus, the discussion on late adopters' adaptation to remote work is partly on a more general level on how employees have adapted. However, the indirect link comes from the fact that remote work is generally dependent on remote work technologies, and a link between the technologies and late adopters does exist. This might provide some implications even on the more general-level remote work discussion.

In terms of remote work as a whole, the findings of this study imply that generally, late adopters have adapted to remote work rather well. Aligning with previous research, especially the employees with more independent jobs found that their adaption, at least in terms of working, went smoothly.

Existing literature finds that remote work can lead either to increased or decreased productivity. Arguably, more commonly the evidence supports increased productivity (e.g. Jacobs & Van Sell, 1996; Cook, 2019; BCG, 2020), especially as during the pandemic, 75 per cent of employees are able to maintain or improve their productivity on individual tasks and 51 per cent on the collaborative tasks (BCG, 2020). However, interestingly, each interviewee in this study found their productivity to be worse. For instance, increased instant messaging was found to be distracting, similarly to the findings of the study by Tams et al. (2020). An interesting link can be drawn between late technology adoption and productivity in a situation heavily dependent on technology. Perhaps late adopters find themselves to be less productive when they are using technologies more than usually. This is pure speculation, but this presents an interesting hypothesis for further research.

What made the adaptation more difficult was that the extent of remote work was usually full-time. As discussed by literature by Allen et al. (2015), while remote work has found to have benefits, the extent of it matters. As Golden and Veiga (2005) point out, remote work may be most beneficial when it is practised to a moderate extent. The findings of this research support this. COVID-19 has forced many workers to full-time remote work, and as a result, one of the interviewees noted: “It is suitable for a part as working as a small amount, like for one day a week, but every day is not for me.” The findings of this study suggest that even late adopters see the benefits of working remotely every now and then but find that working remotely full-time is counterproductive.

Not only is the extent of remote work an affecting factor, but so is the initial level of social connectivity. When an individual is feeling socially connected when working at the office, the individual is also more likely to feel socially connected during remote work (Steinfield et al., 2008; Hage et al., 2015). This lines up with the results of this study, as new employees who did not feel like they were properly a part of the work community yet found the social aspect to be more lacking than the employees who had worked in the same company for a longer time. Thus, adaptation is likely to be more difficult for newer employees and employees with lower level of social connectivity.

In the findings of the study, one of the interviewees pointed out that long-term remote work might lead to a situation where the employee feels disconnected from the organization

and its goals, and Interviewee 3 found himself less motivated in the home environment. As discussed by Malhotra et al. (2007), this presents leaders and mangers with the issue of figuring out how to recognize when employees are feeling unmotivated, a need for direction, etc. Frameworks for preventing these unideal situations exist (e.g. Newman & Ford, 2020), yet research finds that employees are still feeling these negative feelings during remote work. Thus, organizations are posed with the question of how to utilize these frameworks in practice to ensure that employees are actually adapting to the situation well enough.

In terms of technology adoption specifically, the findings had contradicting results. Perhaps the biggest factor that seemed to explain the contradictions in the adoption process was the support regarding using the technologies. As mentioned earlier, late adopters tend to lack the sufficient skills on how to use the technologies, and therefore, need help with using them. As Baker et al. (2006) find, having a sufficient IT support is crucial for a successful remote work experience. Arguably, it is even more important for late adopters, who are often lacking sufficient IT skills. This study found that the employees who had proper support in the beginning thought that the transition to remote work went rather smoothly, as the training and instructions they had received for the communication technologies made adapting the new technologies easier. On the contrary, especially one of the interviewees found herself in a very stressful situation as she had not received any kind of training or support in the beginning and was therefore forced to learn how to use the technologies by herself. This supports the claim that employees must have the skills, or the virtual competence, to use these technologies in an effective way (e.g. Wang & Haggerty, 2011; Finnie et al., 2018).

In addition to employers' support, peer support has been found to be important for learning new technologies (Fulk, 1993). However, as the pandemic has forced many workers to work remotely full-time, peer support has not been as readily available. The findings of this study suggest that the unavailability of immediate peer support truly has an effect on both the productivity of the workers and the quality and speed of their work. Some employees were even ready to leave things unasked as they were not able to talk to their co-workers face-to-face. This ties in with the social connectivity discussed earlier – especially for the employees with lower initial level of social connectivity, only relying on online channels for peer support might rise an issue.

However, despite certain issues, the results of this study suggest that generally, even late adopters have adapted to remote work rather well. This suggests that employees could work remotely more than they have before this. Remote work provides employers with

benefits such as cost cuts (Global Workplace Analytics, n.a.) and evidence about employees' ability to adapt further supports the idea about increasing remote activities. Even one of the interviewees of this study believed that the company she works at will never return to a situation where all employees would be back to working at the office full time.

5.3 View Changes of Late Adopters

The previous section briefly touched the factors that affected how well late adopters have adapted to the situation. This section discusses the second question, which relates to the views and possible view changes of late adopters, i.e. the second research question:

> 2. Have late adopters' views changed on the virtual technologies such as Teams, Zoom, etc.?

The pandemic has forced many employees to quickly learn how to use new, advanced technologies (EY, 2020; World Economic Forum, 2020). This sudden leap in technology usage has resulted in a quicker pace of digitalization of labour (Savi´c, 2020), and simultaneously, speeded the technology adoption process (McKinsey, 2020). Late technology adopters, who are by default suspicious towards new technologies (e.g. Mazzarol & Reboud, 2019), have been no exception. In order to adapt to using the remote work technologies on a daily basis, they have had to learn how to use them and become acquainted with them. Therefore, it is interesting to examine whether becoming familiar with the technologies is changed the way late adopters view them.

To examine possible change, initial views need to be discussed first. Again, late adopters have a lengthy technology adoption process due to their suspicions (e.g. Mazzarol & Reboud, 2019). Arguably, late adopters lack the needed skills and virtual competence required for a successful remote work experience due to their fact that they have used the technologies less than earlier adopters have. This was the starting point of all the participants of this study. All of them indicated lack of trust, skills, and/or experience in using the technologies, and most of them told explicitly that they were suspicious towards the technologies when they realized that they needed to start using them, whether the suspicions concerned the functionality or trustworthiness of the technologies.

However, all of the interviewees had to work remotely for at least three months, most of them longer, which gave them the chance to get acquainted with the technologies. The findings of this study suggest that the views may have changed slightly, but by no means dramatically. Generally, the findings imply that after being forced to use the technologies on

a daily for a significant period of time, late adopters may find the technologies to be more useful than they had expected. Some of the participants of the study even believed that they would continue using the technologies even after the enforced remote work situation was over. Despite the sceptical nature of late adopters, every interviewee in this study found some positive features and aspects from the communication technologies, whether it was the increased flexibility, well-thought features, or the sense of community in a group chat. Finding positive aspects from the technologies is the first clear view change that this study implies.

Trust plays a role in how individuals perceive technologies (McKnight et al., 2011), and this is even more heightened for late adopters, who avoid and are suspicious towards new, risky and unproven products (Uhn et al., 1070). Furthermore, the characteristics of the technology provider affect whether individual chooses to trust a technology (Bahmanziari et al., 2003). The findings of this study support these claims, as the study suggests that late adopters have difficulty to trust the technologies initially, but having a well-known and trusted provider makes it easier for them to trust that the technology works. In addition, this study found that when forced to use the technologies on a daily basis, late adopters may start slowly trusting the technologies despite their initial suspicions.

However, while the views changed slightly, none of the interviewees were fully comfortable with the technologies even after a long time after the initial beginning of remote work. In terms of social connectivity, none of the late adopters in this study found the communication technologies comparable, even after months of using them on a daily. This may partly be due to the fact that current technologies are not advanced enough to facilitate meetings that are fully like in-person meetings (e.g. Hacker et al., 2020). However, as Young (1995) has suggested, late adopters are more likely to believe that face-to-face communication cannot be substituted with communication technologies. Similarly, the lack of peer support regarding the use of technologies may have had an influence on the issues especially late adopters have experienced. Thus, the findings of this study further confirm that late adopters need a long adjustment period for adopting new technologies.

5.4 Employers' Actions and Their Impact

The last research question concerned employers' actions during the pandemic, and how the actions affected the adaptation.

3. How have employers' actions affected the adaptation?

The actions employers take can affect the outcomes of remote work significantly. Perhaps the most important aspect of this is the support (e.g. training and instructions) the employer provides to its employees. As Baker et al. (2006) find, having a sufficient IT support is crucial for a successful remote work experience. Similarly, the findings of this study suggest that the employees who had proper support in the beginning felt that the transition to remote work went rather smoothly, and some of the interviewees found a link between the smooth transition and the training and instructions provided for the communication technologies. On the contrary, employees who do not receive proper, or any, support may find themselves in a stressful situation when they have to learn how to use the technologies by themselves. Furthermore, the results of this study coincide with Baker et al.'s (2006) suggestion about centralizing the remote work support of the company, as one of the interviewees felt lost due to the unclarity of where to contact in the case of problems arising.

Another technological implication for employers is that employers need to assess the technologies used. The pandemic has highlighted that perhaps the most important factor in choosing which technologies to use are the employees who use the technologies, because employee satisfaction on the technologies is connected to productivity (Ashok, 2020; BCG, 2020). The findings of this study support this claim, as the late adopters examined found themselves to be less productive during remote work than they would have been at the office. Thus, organizations need to stay informed on what kind of wants and needs employees have regarding the technologies they have (Accenture, 2020). In addition to providing support during extraordinary times like a pandemic, employers need to invest in both, the technologies and the training of the employees' ICT skills (OECD, 2020), even if the amount of training often needs to be significant, especially due to the fact that 46 per cent of companies lack workforce that is skilful enough to leverage the technologies used (Earth Institute of Columbia University & Ericsson, 2016; EY, 2020).

In addition to providing employees with more technical support, employers can also affect how socially connected employees feel when working remotely. Casual conversations become rarer and more difficult to duplicate during remote work (Fernandez, 2020). The findings of this study suggest that this lack of informal interaction with co-workers has been one of the most significant issues during the pandemic. However, ways to decrease the negative effects of this also exist: based on this study, employees find informal remote meetings, like coffee moments on a Teams call, a positive and refreshing habit that reinforces the social connectivity. This provides managers with a suggestion on how to continue

leading a team virtually, as some managers may not have prior experience on the topic (Newman & Ford, 2020).

Approximately one third of the employers did not have any kind of emergency plans prior to the pandemic, and over 70 per cent had trouble adapting to remote work (SHRM, 2020). When organizations have no emergency plans and lack policies to support remote work (Upwork, 2018), discontinuities in remote work are inevitable. The pandemic has shown that in order to remain effective, employers need to be prepared for sudden situations and crises.

6 Conclusions

This study aimed to understand how the unprecedented COVID-19 pandemic has affected the workforce, and more specifically, how it has affected the late technology adopters of the workforce who have been forced to work remotely. This was done by a thorough review of prior literature and research, and then, by conducting interviews with late adopters to examine their views and thoughts about the unique situation that has forced them to work from home and use technologies of which they were initially suspicious. The study found that late adopters are capable of adapting to sudden enforced remote work situation, even though they are likely to face some issues during it. Especially with proper support, late adopters can learn how to use technologies rather quickly, and find them functional, even if it would take a lengthy time to truly find the technologies to be comparable to face-to-face situations.

6.1 Theoretical Implications

This study adds to the research on Diffusion of Innovations theory by examining late technology adopters in a unique situation. The study suggests that even in a situation where the adoption of new technologies is forced upon late adopters, the adoption process is lengthy and late adopters can remain sceptical for a long time after starting to use the new technology.

The attributions to DOI are also layered with contributions to research on remote work. As remote work is becoming increasingly popular, understanding how remote work affects both, the organization and its employees, is essential. The pandemic has provided unique situation to test the existing theories and contribute to them. This study offers further proof for theories about the productivity of remote work, the desirable extent of remote work, the suitable jobs for remote work, and for several other aspects of theories on working remotely.

From another perspective, it contributes to the academic research on the effects of COVID-19 pandemic. The research for the effects on the workforce is rapidly increasing, and this study helps to understand the implications better. The study implies that while the late technology adopters are likely to face some issues during the time of the pandemic, they can still adapt rather well to unprecedented situations.

6.2 Managerial Implications

The aim of this research was to showcase how late adopters react to situations where technology adoption is inevitable. The interviewees had many ideas and views on the ways their managers handled the situation. The results of this study indicate that providing support, especially for using new technologies, is crucial for employees who are among the latest people to adapt innovations. Providing training and support makes employees feel more sure about themselves and helps them to work more productively. Another managerial implication is that throughout remote work, one of the biggest issues is receiving timely replies, no matter what the topic.

Furthermore, the findings of this study indicate that the Finnish workforce is relatively ready for a shift towards more remote-based work. Even late adopters can adapt to remote work rather well, which is why it is reasonable to assume that especially with proper training, the workforce can adapt to increased amount of remote work even after the pandemic. Employers can leverage this in the future by examining whether the employees should continue to work remotely after the pandemic, even to some extent. If executed properly, this could provide managers with possible savings.

6.3 Limitations

First, possible issues with reliability and bias. While the interview questions were formed in a non-leading way, it was inevitable that the initial questions about the interviewees' stances on remote work and the technologies had a certain tone to them. Thus, it is possible that the tone led them when answering the actual interview questions. This creates a possibility for both, interviewee bias and interviewer bias. Arguably, all the interviewees had certain bias towards the topic, which was crucial for the study. However, this was taken into account by doing proper preparation and following the guidelines for a successful interview provided by Krishnaswami and Satyaprasad (2010: 109-110) and Saunders (2007: 328).

Second, possible issues with validity and generalisability. Due to the sample size, generalizations about the entire population cannot be made. Furthermore, the sample of interviewees consisted fully of Finnish people with a high level of education (either finalized or in process), so the findings may not be applicable for other nationalities or people with other levels of education.

6.4 Suggestions for Further Research

Firstly, the limitations of this research, and especially the sample of the empirical part, provide several possibilities for further research. The sample size was very limited, and more thorough implications could be drawn from a larger sample. Furthermore, the sample of this study consisted of Finnish people, who either had high level of education or who were in the midst of their studies for higher education. Therefore, the topic could be examined from the perspectives of different demographic groups.

Secondly, the findings suggested that some sort of a link might exist between late adopters and decreased productivity in remote work. While this was merely a speculative idea, examining whether the link actually exists could pose an interesting research topic in the future. Similarly, other aspects of late adopters in relation to remote work offer many interesting research ideas.

Thirdly, the study was conducted when many restrictions were still in place. Examining the topic and the affects that COVID-19 pandemic has had on the workforce, remote work, etc. after the pandemic poses many interesting research possibilities. For instance, examining how much late adopters have continued using the communication technologies, how well workers adapt to returning to the office after a long remote work period, whether employers have changed their remote work policies, etc. are all interesting topics that can provide possibilities for further research.

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