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Telecommuting: Innovation's Friend or Foe?

A case study investigating the influences telecommuting has on the internal elements of innovation in startups

by

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Abstract

Following the increasing prevalence of telecommuting in the business world, this study focuses on the influences telecommuting has on the innovation process from an organisational perspective. After a brief introduction on the significance of telecommuting and innovation in startups, both theoretical research gaps and practical issues that come with these are presented within the study. Through the means of a literature review, the study then conceptualises and establishes boundaries for both innovation and telecommuting in a manner most relevant to this research. In order to answer our research question, a single case study was conducted which included the interviewing of eight individuals working at Sonantic Limited. By means of a thematic analysis our empirical findings were presented with both theoretically proposed and observationally derived themes. The evidence suggests that telecommuting has positive, neutral, and negative influences on the innovation process as a whole. Thereafter, emerging patterns and their influences on innovation are discussed as well as the theoretical and practical contributions of the study. Finally, our study proposes further research avenues that are of greater importance to both academics and future stakeholders of telecommuting.

Keywords: telecommuting, innovation, startups, organisation

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1 Introduction

1.1. Background

Digitalisation has affected human lives greatly in recent decades. Whether at home, on the road, or at work, digitalisation has impacted the lives of millions of people. More specific to work places, the development of computers, mobile phones, and the internet have all had enormous influences on the way firms operate. Hereby, the shift in the work environment to telecommuting is no exception. Telecommuting, more commonly known as remote work, has been discussed as early as the 1970's and is becoming ever more relevant as a more viable option for both employers and employees for diverse reasons. Accelerated by the Covid-19 pandemic, telecommuting has once again been under the global spotlight with a variety of opinions voiced.

As the outbreak of the Covid-19 pandemic took a grip on the world at the end of 2019, many businesses were forced or voluntarily resorted to telecommuting in an effort to keep people safe. Such companies included Google's parent company Alphabet, Twitter, Apple, Microsoft, and Amazon, which saw many of their staff telecommuting for the first time in their lives (BBC, 2020). In fact, the percentage of employees working from home for 5 days or more during the Covid-19 pandemic increased from 17% to 44% in the US alone (Mlitz, 2021). Nevertheless, telecommuting has been on the rise pre-2019 with the Covid-19 pandemic proving to be the slight push it needed to take off. Telecommuting has grown over 170% between 2005 and 2018 in the US, with 80% of employees wanting to work from home for at least some of their office hours (Global Workplace Analytics, 2020). Some reasons for the increase in telework even before the Covid-19 pandemic include the improvement of technology, an increasing global shift to the information, and communication technology industry and the high demands of labour associated with it (Allen, Golden & Shockly, 2015; European Union, 2020).

Although telecommuting has played an important role in multiple disciplines such as "psychology, management, transportation, communication, and information systems," (Allen, Golden & Shockly, 2015, p.41), much uncertainty surrounds its effects. Despite limited research existing on this untraditional way of working, it is considered a solution towards a more composed work-family balance, less greenhouse emissions, and the expansion of work opportunities (Allen, Golden & Shockly, 2015). Until now, most research around telecommuting from an organisational perspective has focused on the productivity of employees (Bailey & Kurland, 2002; Baltes, Briggs, Huff & Wright, 1999; Gajendran & Harrison, 2007; Ollo-Lopez, Bayo-Moriones, & Larraza-Kintana, 2010). The results suggest individual productivity overall being higher when telecommuting. However, many other aspects, besides productivity, are left understudied and, thus, unanswered. One of these very narrowly investigated fields of interest includes the role of telework and its influences on the innovation process (Coenen & Kok, 2014).

Propelled by globalisation, fierce international competition, and digitalisation, the business world is continuously changing. Innovation has played a crucial part in business literature for decades and proves to be the backbone for many firms seeking a competitive edge and, more importantly, survival (Baregheh, Rowley & Sambrook, 2009; Bessant & Tidd, 2015; Francis & Bessant, 2005). The process of innovation deals with the improvements of products, services or processes and is an important part for organisational growth and advancement. Much research exists on the phenomena of innovation with most of its influences accredited to innovation capabilities possessed by firms (Aas & Breunig, 2017; Bessant & Tidd, 2005). Innovation capabilities and other influences conceptualise how and where innovation originates from and what firms need in order to thrive through innovativeness. As innovation plays such a crucial role for companies in general, it is important to understand the influence of a changing workplace environment on the process, especially with telecommuting gaining attraction on a global scale. These implications affect employers, employees, policy makers, and other stakeholders.

As aforementioned, being innovative is key for a firm's survival and development. This holds especially true for young companies such as startups as their birth is typically built in bringing new ideas to market and commercialising them (Spender, Corvello, Grimaldi & Rippa, 2017). This makes startups an exemplary case area to study in regards to innovation. Furthermore, it is assumed that younger, less established firms tend to be more likely to telecommute as a

result of their limited resources, thus, saving expenses on office rent, for example (Xuezhao, 2019). Moreover, the number of startups across the world has been rising for the last two decades (Worldbank, 2021), making them a riveting target area of research.

1.2. Problematisation

As touched upon in the previous section, it is evident that research investigating the influences telecommuting has on the innovation process is largely limited (Allen, Golden & Shockly, 2015; Coenen & Kok, 2014). This research gap is problematic in two ways: theoretical and practical. From a theoretical perspective, the assumption can be made that literature about innovation has primarily been built upon traditional working ways with a strong focus on in-person cultures. This is a result of telecommuting not being very predominant during the time of curation of various academic writings. Consequently, much room for improvement is left as innovation theories must adapt to emerging and alternative ways of work settings such as telecommuting. Theoretical apertures also exist within the literature dedicated to telecommuting. When conducting research on a spotlight topic such as telecommuting, a very limited amount of studies on topics outside of employee productivity exist. Although employee productivity is important to any organisation, there are many other areas of interest that prove important when understanding the influences telecommuting has. Often with contradictory results, inconsistent definitions, and a lack of credibility, this field of research which carries with it great implications for the future of working, hence, demands further conceptual advancements.

With the theoretical issues identified in this field of research, reflecting upon the practical drawbacks coincides. It can be assumed that because of the lack of academic backing as well as the absence of necessary experience due to telecommuting simply not having been around enough, executives are lacking both the know-how and the resources to effectively manage this new work environment. For managers overseeing telecommuting of their firm, it is crucial that they take on a strong leadership role and give guidance to their employees (Kazi & Hastwell 2021; Allen, Golden, Shockly, 2015). Despite the responsibility they carry towards their employees, managers must also pursue their responsibilities towards the firm and other various shareholders. Ensuring a company running as smoothly as it previously did during traditional working methods may prove as a challenge to some. Additionally, some

employees may struggle in their pursuit of a healthy work-life balance as many individuals experience telecommuting for the first time in their lives and lack experience in dealing with this new setting (Gajendran and Harrison, 2007). Furthermore, policy makers must understand the effects of telecommuting on people, the economy, the environment, and other dimensions in order to facilitate the successful utilisation of telecommuting. Overall, many individuals across the world are experiencing telecommuting for the first time and are seeking guidance. As previously stated, telecommuting has been thrust into action on accounts of the pandemic, nevertheless, the trend is already becoming clear that it will prevail after (Lund, Madgavkar, Manyika, Smit, Ellingrud, Meaney & Robinson, 2021). Therefore, it is important to highlight that addressing the issues identified will also be prevalent even after the Covid-19 pandemic and is not confined to it. Given the significance of these issues, our research aims to start providing valuable insights and incentivise further research in this area.

1.3. Aim and Objectives

With backing of the above recognised research gaps, the aim of this study is to better understand the influences telecommuting has on the processes of innovation from a more micro, organisational perspective. More specifically this study aims to understand how elements of innovation identified through innovation capabilities, discussed in section 2.1.2., and internal influences on innovation, discussed in section 2.1.3., are affected by telecommuting. Based on these aims, our research question is as follows:

How does telecommuting influence different elements of innovation from an organisational perspective in startups?

One objective of this research paper is to collect and construct a holistic overview of the research existing on innovation and telecommuting which will help to highlight the existing gaps in more detail. Moreover, this study also aims to reiterate a clear definition of telecommuting, in order to make this as well as future research more comparable by setting clear boundaries. Finally, probable and insightful conclusions will be developed by analysing the interviews of our case study; these should spark incentive for further research while synthesising useful insights for various stakeholders.

1.4. Research Purpose

Although this study is restricted by time, word limit, and scope, there remains a large potential for the curation of valuable insights. As aforementioned, even though telecommuting has gained prevalence the past few decades, the research that exists on this area of business is limited. A world moving towards utilising more telecommuting could have salient influences on employers, employees, policy makers, families, and other affected parties. The purpose of this research is to shed light on understudied areas of telecommuting and incentivise researchers to branch out into more areas than has previously been the case. The study also sets out to understand the influences telecommuting has on innovation and has the possibility of synthesising probable conclusions. These conclusions may encourage researchers and provide guidance for future studies. Another purpose of this research is to give managers and employees probable insights on the influences telecommuting has on the innovation process while inferring how to adjust practices to better deal with this new setting. This study should inspire solutions to experienced difficulties caused by telecommuting to go beyond contributions to just theoretics.

1.5. Delimitation

As expected, our research paper is shaped by various delimitations. These boundaries occur due to several factors including time, word limit, and the nature of research in general. The scope of our research is specifically framed by the approach taken towards innovation, our focus on startups and our definition of telecommuting. Given that the focus is on the internal, organisational level to innovation, as opposed to a broader macro level, for the purpose of this study, the scope of innovation was chosen to be relatively narrow when considering the full potential magnitude of it. More concisely, because telecommuting as a work setting in itself is an organisational element, internal influences of innovation are impacted more by telecommuting. Hence, these internal aspects of innovation will play a more central role as opposed to external ones, which will be further elaborated in section 2.1.1.. As briefly mentioned in the background, this study targets the startup environment as opposed to more corporate-level firms. Early-stage companies heavily rely on innovation which makes this seniority degree the most suitable choice for this case study (Spender et al. 2017). Nevertheless, the fact is acknowledged that traditional firms also have a need to innovate to

stay competitive (e.g. Barney, 1991) which makes this study relevant for all types of company levels. Furthermore, startups are more inclined to telecommute as a result of their limited resources and expenditure capabilities (Xuezhao, 2019). The last delimitation is the scope of telecommuting. Specific to this case study, individuals will have been telecommuting full-time due to the ongoing Covid-19 pandemic. This implies that the interviewed individuals will have had no in-person interactions with their colleagues in regular office hours within that period of telecommuting. Although a delimitation, it proves to be a significant opportunity as well as criterion to study the effects of telecommuting on innovation.

1.6. Outline of Thesis

This research paper is organised into five main chapters. Chapter 1 introduced the subject and problematisation of the research paper as well as its delimitations, aims, objectives, and purpose. Next, Chapter 2 presents a literature review in which innovation is defined and conceptualised in a scope most relevant to the study based on previous research. This Chapter will also examine the importance of innovation to startups, with the last part dedicated to understanding, setting boundaries, and revising previous research on telecommuting. Chapter 3, the methodology, will outline the research approach and reflect on the choices made. In Chapter 4 a thematic analysis will be applied to the obtained data to identify the empirical findings of this study. Finally, Chapter 5 will discuss the findings as well as providing conclusions, research implications, and suggestions for future research.

2 Literature Review

The following review of literature will provide a comprehensive evaluation of key concepts, generally innovation, startups, and telecommuting, formulated and examined in relevant literature. As these subject matters are rather broad, further seen in subsequent paragraphs, the focus will be on chosen domains that correspond with the research topic of this paper; investigating the influences telecommuting has on a startup's innovativeness. Hereby, a broader definition of innovation is introduced (2.1.) before bringing attention to innovation capabilities (2.1.1.) and the internal influences on innovation (2.1.2.). These two subdomains will help understand how and what drives a firm's innovativeness. This plays a central role in answering the research question beyond the pure understanding of whether a firm is innovative. Thereafter, we will look at the important role of innovation in startups (2.2.) to underline why we chose this specific setting as part of our research. Lastly, the concept telecommuting (2.3.), more commonly known as remote work, will be thoroughly reviewed, leading to the research gap that is addressed within this paper. Highlighted learnings and connections will henceforth build the base for the following case study and interview questions, as well as the analysis of the findings, and their discussion.

2.1. The Concept of Innovation

The notion that innovation is integral not only for individual business entities but also for markets and industries as a whole to survive and thrive has become a widely accepted statement, researched and studied by many scholars (Baregheh, Rowley & Sambrook, 2009; Bessant & Tidd, 2015; Francis & Bessant, 2005). Yet, many researchers have also recognised that the label ‘innovation’ seems to be notoriously ambiguous, leaving much space for confusion about its definition behind. This roots from numerous and diverse attempts of its formulation (Adams, Bessant & Phelps, 2006; Baregheh, Rowley & Sambrook, 2009; McAdam, Reid, Gibson, 2004). Even though there are several different definitions of innovation, one can identify commonalities among them. These attributes include the recognition that innovation is a dynamic process rather than a static event (Damanpour, 1996;

du Plessis, 2007), the commercialisation of an idea expressed through a new product, process, or service (Thompson, 1965; West and Anderson, 1996; Wong, Tjosvold & Liu, 2009), and the depiction of newness and change within an organisation in response to the evolving external environment even if uncertain (Damanpour, 1996; du Plessis, 2007; Thompson, 1965; Van de Ven, 1986). Baregheh, Rowley and Sambrook (2009) investigated the issue of elaborate variances in regards to defining innovation further by undertaking an extensive content analysis of various present attributes of definitions of innovation. This resulted in a multidisciplinary definition based off their findings; the resulting description is as followed:

> Innovation is the multi-stage process whereby organisations transform ideas into new/improved products, services or processes, in order to advance, compete and differentiate themselves successfully in their marketplace. (p. 1334)

2.1.1. Innovation Capabilities

Innovation as a general concept, as seen in the previous section, will help in the examination of firms to understand whether they are innovative. However, in regards to our research, the questions of how firms are innovative is the matter of relevance in question. Therefore, this section will review the concept of innovation capabilities, seeking to explain how firms are innovative. In reflection of the confusion the definition of innovation has sparked, the alignment towards a definition of innovation capabilities, unsurprisingly, presents a somewhat fuzzy outcome as well. According to Aas and Breuning (2017), there are several discrepancies to be found in the literature surrounding 'innovation capabilities', making it marginally unclear as to what the exact definition is and what facilitates them. Therefore, this part of the literature review will not only focus on writings centered around innovation capabilities themselves but will also include relevant literature surrounding this concept, complementing each other to draw a more holistic picture of this theory.

First, it is important to recognise what capabilities are in principle and how they come to be. According to Bessant & Tidd (2015), capabilities are built through continuous learning, undertaking a trial and error method such as experimenting, testing, or prototyping. The authors declare that capabilities are the result of processes that recognise failure as a crucial part, leading to important learnings from those failed experiences which effectively prompts improved capabilities. This continuous rhythm leads to a "cycle of vicarious learning"

(Bessant & Tidd, 2015, p. 487), reinforcing and developing not just one's own capabilities but also helping others learn and build theirs as it trials on.

The term ‘capability’ is commonly referred to in business literature with one of the most familiar concepts being the one coined in the 1990s by David John Teece, ‘dynamic capabilities’ (Teece, Pisano & Shuen, 1997). This concept, as we will discuss later, shares many alike attributes with innovation capabilities. However, the theory of dynamic capabilities is connected to strategy literature, aiming to explain competitive advantages as such rather than innovation literature which innovation capabilities are appropriated to (Teece, Pisano & Shuen, 1997). Although the two areas of strategy and innovation are obviously separated, the fact that they seemingly overlap in their key concepts has been pointed out by many scholars throughout the past decades (Pisano, 2015; Porter, 1990; Tidd, 2006). Porter (1990) proclaims that innovation capabilities are the key to productivity which creates a firm’s competitive advantage by distinguishing the new and improved way to compete in an industry and conquer the market. According to Tidd (2006), there are several aspects to achieving a competitive advantage that innovation contributes to. Hereby, the most crucial contributing attributes of innovation that he mentions involve a strong relationship between new products and their market performance, the securing support of maintaining market shares, and the improvement of the firm’s profitability. Lastly, Piano (2015) highlighted the connection in recent years as well, stating that innovation, especially technological innovation, poses as a significant creator of economic value as well as a facilitator of competitive advantage.

There seems to be a connection and overlap of strategy and innovation literature which makes it clearly discernible that a review of relevant writings of strategy are necessary to fully explain the key concept ‘innovation capabilities’. The previously described general capabilities stressed the importance of learnings, failure, and the reinforcing cycle connecting the two in developing capabilities (Bessant & Tidd, 2015). The word ‘learnings’ can be partially substituted for the word ‘knowledge’ and thus implemented in Bessant and Tidd’s (2015) definition; vis-à-vis building and developing capabilities on the basis of the firm’s knowledge that gets refined after a failed experience. Knowledge, as perceived by many recognised scholars (Barney, 1991; Cohen & Levinthal, 1990; Spender 1996; Teece, 1997), is a fundamental resource, and resources build the foundation of various theories that were conceptualised in the 1990s, explaining the development of not only firm’s organisational

capabilities but also competitiveness and, thus, in part, innovation capabilities. This reasoning is in line with recent findings by Aas and Breunig (2017), stating that having strong innovation capabilities calls for grooming "a combination and orchestration of resources to maintain fitness along with external changes" (p.11). With that being said and established, three prominent theories will be shortly reviewed to underline pertinent key concepts and findings that influence and support the theory of innovation capabilities as such; the resource-based view (Barney, 1991), dynamic capabilities (Teece, Pisano & Shuen, 1997), and absorptive capacity (Cohen & Levinthal, 1990).

During the 1990s the idea was formed that the notion of resources and capabilities of a firm were to be viewed as a blended, interconnected concept rather than two individual and independent abstractions; a theory that researchers now universally recognise as the resource-based view (RBV); a school of thought which Barney's (1991) work is seen as the foundation for. He argues that if utilised correctly, resources (if valuable, rare, imperfectly imitable, and not easily substituted) can build the basis for a firm's competitive advantage. This theory was picked up later by Spender (1996), agreeing with Barney (1991) that very specific resources, amongst other attributes, are imperative for a firm to sustain its competitive positioning. Spender (1996) underlines that the resource that should obtain most significance, hereby, is knowledge which conveys the salient connection to innovation theory and innovation capabilities. Aas and Breunig (2017) add that as innovation is correlated to a firm's performance and, therefore, "[a]ccording to the RBV, it is the creation, ownership, management and deployment of intangibles, specifically knowledge and relationships, which explain variations in performance" (p.9) and, henceforth, innovation capabilities.

The second theory from strategy literature, that is not only connected to the concept of innovation capabilities but shows overlapping characteristics and similarities, is the postulation of dynamic capabilities. According to Teece, Pisano, and Shuen (1997), dynamic capabilities are "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments (p.516)". Moreover, the authors argue that having these capabilities shows possessing the capacity to execute a task or activity through the utilisation of resources, even if conditions are opposing. This notion of performing under opposing conditions mirrors the uncertain circumstances that innovation is often, if not always, seen in (Teece, Pisano & Shuen, 1997) as mentioned previously. These

definitions show clear convergence to, what we will later discuss in more detail, innovation capabilities.

Teece, Pisano and Shuen (1997) recognise in their paper that rapid responsiveness to capitalise on inventions (innovation) are critical to the firm's survival and competitiveness. They coined the term 'dynamic' to symbolise the capacity of a firm to renew competencies to stay in the competitive position it holds. In other words, the authors recognise that innovative responses (or the utilisation of innovation capabilities) are required to achieve congruence in the ever-changing marketplace. Teece (2014) picks up this notion to underline that there are three essential dynamic capabilities to keep up competitiveness; being able to recognise opportunities and threats, take advantage of opportunities, and adapt the firm's strategy to capitalise on it. Recalling the definition of innovation that was introduced earlier in this paper, capitalising on a new idea by going through a transformation process to stay competitive, the similarities of the two concepts appear to be very prominent.

Moreover, Teece, Pisano and Shuen (1997) highlight that the dynamic capabilities approach to gain and sustain a competitive advantage "is especially relevant in a Schumpeterian world of innovation-based competition" (p.509); a scholar that accentuated the critical role innovation plays for economic change. However, even with these striking similarities, Aas and Breunig (2017) point out that there still are "conceptual underpinnings" (p.8) of dynamic capabilities when comparing to innovation capabilities that are underdeveloped and, thus, raise ambiguity which calls for more attention to the research of innovation capabilities in an isolated manner.

Both formerly reviewed theories, the resource-based view and dynamic capabilities, centralised knowledge per se as a crucial attribute when it comes to developing innovation capabilities to conquer evolving market movements to stay competitive. Therefore, when investigating literature relevant to innovation capabilities, reviewing the absorptive capacity, conceptualised by Cohen and Levinthal (1990), appears as necessary. According to the authors, absorptive capacity describes the ability to immerse new and external knowledge and utilise it to realise innovative products or processes. Capozza, Salomone and Somma (2020) highlight the importance of this two-decade old finding in the 21st century by recognising that with the increasing competitiveness and rapid technological developments, firms that want to innovate do not have the luxury anymore to only rely on the internal efforts to create strong

knowledge resource but must leverage and absorb external knowledge to complement those in-house efforts.

According to Cohen and Levinthal (1990), absorptive capacity mainly develops through internal research and development (R&D). Hereby, Capozza, Salomone and Somma (2020) propose furthering this thought by arguing that the direct internal stimulation of knowledge and innovation through in-house R&D also facilitates the exploitation of external knowledge itself by engaging employees in the process. Generally, the author's study supports the significance of in-house R&D and, thus, absorptive capacity for innovative processes. They, furthermore, found that highly educated founders, as well as founders with former industry experience had a noteworthy influence on innovation. Here again, it shows that strategy literature holds undeniable parallels with innovation theory which, in turn, shows the importance of including these concepts in the investigation of innovation capabilities. Aas and Breunig (2017) support this correlation by stating that "knowledge and absorptive capacity [are] necessary to carry out innovation" (p.18) though it differs depending on the exact context.

With the roots for the concept clearly having been reviewed and established, it is only left to identify the nature of innovation capabilities as such. Based on previous writing, it is evident that there is a clear connection to resources and their employment to create and nurture the firm's capabilities which will help stay present through tackling newness and development (Barney, 1991; Bessant & Tidd, 2015; Teece, 2014; Teece, Pisano & Shuen, 1997). It also became apparent that the special role of knowledge, its utilisation, and its maturing poses as a central key concept in building strong capabilities to innovate (Capozza, Salomone & Somma, 2020; Cohen and Levinthal, 1990; Spender, 1996). According to Aas and Breuning (2017), innovation capabilities can be described as "a firm's ability to identify new ideas and transform them into new/improved products, services or processes that benefit the firm" (p.8). This definition reflects both the findings from previous literature as well as the formerly introduced innovation definition itself, opening up for the interpretation that innovation capabilities, essentially, are the potential to innovate. Aas and Breunig (2017) address the identified problem of existing discrepancies and fuzziness of this topic a step further by proposing a framework, arranging innovation capabilities into categories, organised according to two factors; the novelty of the innovation and specific market characteristics (Figure 1).

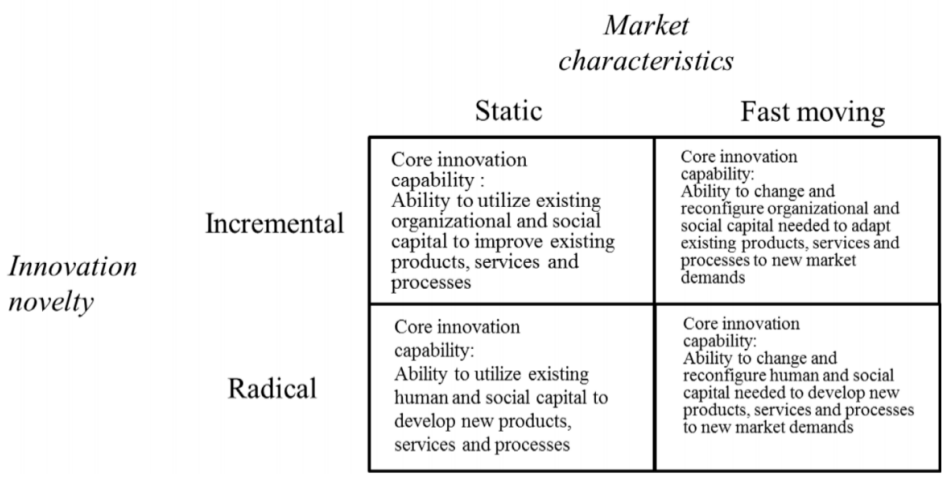

Figure 1. *Four contexts for innovation capability based on degree of innovation novelty and market characteristics (Aas and Breunig, 2017)*

The broad idea the authors draw with this proposition is that while they agree with the notion of understanding and correctly employing the firm's resources (here: capital), they further state the necessity for identifying the firm's more precisely applicable capabilities depending on the more contextual specifications of the innovation itself. Therefore, innovation capabilities are not just generally capabilities needed to innovate but depend, more particularly, on the nature of the innovation itself.

2.1.2. Internal Influences on Innovation

On a more micro level from innovation capabilities, much literature exists on the influences on innovation. This literature focuses on specific influences that stimulate the innovation process. These influences can be external, coming from third parties or individuals outside of an organisation and include innovation systems and networks (Edquist, 1997; Karlsson, Andersson, Cheshire & Stough, 2009). On the other hand, influences can also be, as aforementioned, in house or internal and focus on factors within an organisation or the individuals themselves. These include creativity, knowledge transfers, trust and relationships (Bessant & Tidd, 2015; Karlsson, Johansson & Norman, 2013). Although mentioning the external factors for a more holistic understanding, our literature review will pay most attention to the internal influences as these will play a more important role further in the study. This is because our research is focused on innovation from an organisation perspective rather than a macro level focusing on external influences. The internal influences also play a

larger role for an in-person culture which is a focal point in understanding the influences telecommuting has on innovation (Bessant & Tidd, 2015).

Both innovation networks and systems are similar in that they focus on third party contributions to the innovation process with the difference between the two often being blurred. Innovation systems take into consideration the various infrastructures and institutions that influence the innovation process (Edquist, 1997). These may include the finance, legal, and education systems as well as other subsystems with sharp boundaries nearly impossible to determine (Edquist, 1997). These systems play an important supportive role in the process of innovation and have a similar function to innovation networks. As defined by Karlsson et al. (2009), innovation networks include economic agents that are involved within the innovation process and may include suppliers, customers, producers or even universities and research institutes. They believe all economic agents act as a network supplying different sources of knowledge that may collaborate directly or indirectly through collaborations or spillovers to enhance the innovation process.

Alternative to external influences, a widely accredited internal influence on innovation includes creativity. Definitions of creativity can vary largely but revolve around two main aspects including novelty and usefulness (El-Murad & West, 2004). Creativity is often described as a process for problem solving, creating associations, recognising patterns, and producing something novel and useful (El-Murad & West, 2004). Individuals or firms that successfully draw out, develop and extend their creativity are more likely to innovate and come up with novel ideas (Bessant & Tidd, 2015). Although everyone is creative, Bessant and Tidd (2015) believe that enabling the creative process can play a crucial role in the innovative process. According to the authors, this can be achieved by developing thinking and personal skills, group level creativity and a creative environment. In the real world it is becoming more evident that companies such as Google are trying to enhance the creative process with designated work hours dedicated to interacting and creative thinking while physical work spaces are more commonly designed for interactions and fostering creativity (Vandeloo, 2014). By doing so, firms are proactively involving their employees in the innovation process while increasing the number and variety of new ideas (Vandeloo, 2014).

Another important influence on innovation as mentioned in the RBV includes positive work relationships and trust. Positive relationships do not only enhance the creative process as

mentioned above by creating an encouraging environment for ideas and opinions, but also contribute by strengthening group potency (Wong, Tjosvold & Liu, 2009). Trust in the workspace enables individuals to express themselves without a fear of looking foolish or a pressure to conform (Bessant & Tidd, 2015). This implies that individuals will share more ideas with one another in a positive environment and are more likely to question or critically discuss more when discussing ideas (Bessant & Tidd, 2015). Positive work relationships also facilitate more informal interactions both within and outside the office (Bessant & Tidd, 2015). This can help look at problems from a new perspective in a more relaxed setting. Closely related, group potency - the confident attitude that the group can be effective across tasks - seems to facilitate the complex demands of innovation (Wong, Tjosvold & Liu, 2009). Wong, Tjosvold, & Liu (2009) state that individuals in a confident group will find themselves being more efficient, proactive, and persistent, proving more useful when innovating. They also found their awareness of team-oriented goals will also prove beneficial when innovating as they take advantage of differences in experience or abilities without the fear that others' success will diminish their own. Instead, groups with high potency strive to succeed together (Wong, Tjosvold & Liu, 2009).

The third and last internal influence relevant to this research paper includes knowledge transfers. Knowledge transfers are defined as the process through which knowledge diffuses from one individual to others (Taskin & Bridoux, 2010). Within an organisation, knowledge transfers can play an important role similar to team work. Effective knowledge transfers are critical to innovation and occur through interactions and exchanges of information (Coenen & Kok, 2014; Taskin & Bridoux, 2010). The different sources and transfers of knowledge can springboard small knowledge fragments into larger and more significantly important ideas (Taskin & Bridoux, 2010).

Ultimately, all internal influences are important on both an individual and an organisational level. With the research question focusing on the influences telecommuting has on the innovation process, it will be of interest to uncover the effects telecommuting has had on the internal influences discussed. Professional isolation and other circumstances experienced while telecommuting may have large impacts on an individual's ability to be creative, build positive work relationships, share knowledge and ultimately innovate.

2.2. The Startup and Innovation

As mentioned in the introduction of this chapter and reflected by our research question, the focus of this study lies within early-stage startups. This section will examine the crucial role innovation plays within this setting and how this study is both relevant and interesting. Just as innovation and innovative capabilities, the clear definition of a startup poses as not straight-foward. A well-known and often used definition is attributed to Steve Blank, entrepreneur and announced originator of the lean startup movement; it reads: "a startup is an organisation formed to search for a repeatable and scalable business model" (Blank, 2010, n.p.). Luger and Koo (2005) attribute a startup with being new, active, and independent which is also reflected in Cockayne's (2019) perception who says that a startup generally embodies an active firm in its early stage.

Startups and innovation are very closely linked, as one depends on the other. In "the startup phase, new ideas are brought to the market and transformers in economically sustainable enterprises" (Spender et al. 2017, p.4). This shows how innovation is facilitated through startups, and startups mature through capitalising on innovations. This interdependency is not the only correlation between the two concepts; startups face somewhat of a dilemma in regards to innovation. As established in earlier paragraphs, resources are essential for innovation capabilities and thus innovation itself, which poses as a difficulty for startups who experience a constraint on resources like money, time, and skills (Francis and Bessant, 2015; Spender et al. 2017). Hence, startups find themselves in a challenging position of depending on developing strong innovation capabilities to develop their product or process far enough to survive and compete when having to balance out these resource constraints which oppose such an aim (Colombelli, Krafft & Vivarelli, 2016).

This dilemma is what Steve Blank (2013) is tackling by introducing the idea of applying the lean principle to the operative make of startups. According to Mueller and Thoring (2012), applying this principle will make production processes more efficient "by reducing any sort of waste in the process – this could mean either the reduction of resources [...] or the elimination of needless or redundant activities or expenses [...]" (p.151). Another method to combat the predicament that startups find themselves in when undertaking innovation activities is to offset their constraints to leveraging customer development by understanding the actual demand and desires from customers (Mueller & Thoring, 2012). This focus of the adaption

towards customer needs, or user-centric approach, has certainly shown to work in favour of developing new solutions, however, not strongly enough to balance out the resource constraints startups experience (Blank & Dorf, 2012; Mueller & Thoring, 2012).

2.3. Telecommuting

In the following sections we aim to define and set boundaries on telecommuting as well as review existing research. For the research on telecommuting it is important to set clear standards and definitions for sampling purposes and ensure this case study is comparable with future research. More specific to our investigation, telecommuting is the main variable in focus when examining its influences on the innovation process within startups. A clear definition and understanding of telecommuting will help to establish appropriate research and interview questions as well as strengthen the analysis and discussion of the paper.

Telecommuting, more commonly addressed as remote work, is thought to have been coined in 1973 by NASA engineer Jack Nilles (Allen, Golden & Shockly, 2015). Allen, Golden & Shockly (2015) critique that despite its increasing prevalence, difficulty in conceptualising the true meaning of telecommuting prevails and has impeded the acceptance of a commonly accepted definition. They observed that this has obstructed both the understanding of the field as well as the results from previous studies that can not accurately be compared or lack consistency within their own research. Further difficulties arise from “disjointed literature stemming from multiple disciplines" (p.42) that often disregard one another with differences even existing between American and European research (Allen, Golden & Shockly, 2015). A large contributor to the issue includes the various ways that telecommuting has been referred to. Often interchangeably, telecommuting has been addressed as telework, remote work, distributed work, flexible work, mobile work, virtual work, flexplace, and distance work (Allen, Golden & Shockly, 2015). Despite the large range in terminology, there are few conceptualisations which are widely adopted and often cover similar if not identical distinctions. The conceptualisations with relevant definitions and distinctions to our research will be deemed appropriate to use in our study.

Tele-, mobile-, distributed- and remote work all conceptualise a broader sense of telecommuting and focus on work outside of the main office supported by the use of

technology (Allen, Golden & Shockly, 2015). These conceptualisations do not restrict the work location to be home-bound and include call centers, telecenters, other business sites, branches and affiliates. Although they encompass the two most important distinctions of working away from the central office and using technology in order to complete the work, Allen, Golden and Shockly (2015) argue that call centers or any of the other mentioned locations should not be considered telecommuting. They believe these conceptualisations fail to define other important distinctions such as the employment relationship or the amount of time dedicated to telecommuting. Further they argue that another limited conceptualisation of telecommuting includes virtual work, which focuses merely on relatively short lived work arrangements to overcome geographical dispersion. The authors state that this may include sporadic virtual meetings between foreign teams and does not encompass the depth of telecommuting accurately. Finally, they argue that flexible work does often refer to telecommuting but also includes other flexible work programs such as compressed work weeks or flexitime. Therefore, such a conceptualisation is not relevant for this study.

The most relevant conceptualisation for this study comes from Allen, Golden & Shockly (2015) who have attempted to provide a universal definition of telecommuting by focusing on both the most important and neglected distinctions based on their literature review. Their definition also relies on previously well adopted definitions (e.g. Bailey & Kurland, 2002; Gajendran & Harrison, 2007) as well as the original definition provided by Jack Niles in 1994. The authors define telecommuting as:

> a work practice that involves members of an organisation 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 (p.44).

While seemingly similar to other definitions of telecommuting in terms of mentioning work outside a central office and using technology when needed, the true merit of this definition lies within the extra parameters set by the authors. The parameters reflected by Allen, Golden & Shockly (2015) within the definition allow for a deeper conceptualisation and include:

a. substitute time typically spent in the central office with time spent working away from other employees, rather than working additional overtime hours that might be carried out after a full day in the office;

b. do so for a portion of their regular work time, ranging from a few hours per week to nearly full-time, with hours spent telecommuting tending to follow a set pattern for individual telecommuters but potentially varying among telecommuters in any one organisation;

c. are part of a larger organisation, as opposed to independent contractors or those who are part of an outsourced labor pool;

d. work principally within their home during telecommuting periods, with an occasional period possibly spent elsewhere;

e. use some form of information or communication technology to interact as needed with others both within and external to their central office during telecommuting periods. (p.44)

These parameters narrow down which individuals can be considered as telecommuters and allow for more successful sampling as well as more consistent results in telecommuting research. Although the boundaries set are a proactive effort to unify the growing academia revolving around telecommuting, even the authors acknowledge the potential need to adapt the definition under certain conditions. One such condition includes the millions of individuals telecommuting full time simultaneously to this research paper.

With a critical approach to the definition proposed by Allen, Golden & Shockly (2015), their definition fails to address that telecommuting can indeed be pursued full time as opposed to *nearly full time*. Within the text it becomes evident that the authors do not see a realistic situation in which an individual would telecommute full time e.g. “Telecommuting is rarely an all-or-nothing work practice” (Allen, Golden & Shockly, 2015, p.45). This may stem from Golden’s bias originating from his previous research heavily focused on the frequency of telecommuting. Often referencing his previous work, the authors seemingly believe the golden middle between telecommuting and office work is a *moderate* amount. This may be one plausible reason for highlighting *nearly full time* as opposed to full time, with a clear

explanation missing within their research paper. Another reason may include unprecedented events such as the Covid-19 pandemic seeing many individuals switch to full time telecommuting for the first time in their lives. Additionally, telecommuting technologies are becoming more developed as a cause of digitalisation and globalisation and are making full time telecommuting a more viable option.

As with any term, it is difficult to perfect any definition as unforeseen changes may occur and can not be accounted for at the time when established. While changing this small aspect of the authors definition of telecommuting, we believe this definition fits our research paper well while maintaining its integrity completely.

2.3.1. Previous Research on Telecommuting

Apart from conceptualising the definition of telecommuting, a lot of research has been dedicated to understanding the effects of telecommuting on both employees and employers. The results are often contradicting and are in need for further empirical testing. Nevertheless, few key insights can be extrapolated from previous research that may successfully hint towards the nature of telecommuting.

Although often promoted to benefit an individuals work-life balance, it remains unclear whether telecommuting truly does. Some research suggests that this may indeed be the case if telecommuting is pursued for more than two and a half days per week with further benefits arriving from a year's worth of experience in telecommuting (Gajendran and Harrison, 2007). Nevertheless, research related to work-life balance lacks empirical evidence and is often based on weak relationships (Allen, Golden & Shockly, 2015). Telecommuting may even harm work-life balance if telecommuters take on more family responsibility, blur their family and work roles as well as fail to establish clear boundaries e.g. normal work hours (Allen, Golden & Shockly, 2015). A more empirically proven effect of telecommuting includes a higher level of job satisfaction as well as reduced stress levels (Gajendran and Harrison, 2007). Allen, Golden & Shockly (2015) state these effects are a result of more autonomy, fewer interruptions and less involvement in office politics but may plateau as telecommuting increases above fifteen hours a week. The authors suggest that the curvilinear relationship may be explained by consequences of professional isolation.

Telecommuting has also been studied from an employer's perspective focusing on more performance driven measures such as productivity. Here, general consensus both in the academic and business world is that productivity and individual performance increases when telecommuting (Gajendran & Harrison, 2007; Kazi & Hastwell 2021; Ollo-Lopez, Bayo-Moriones, & Larraza-Kintana, 2010). However, these studies have also highlighted the importance of leaders and workplace relationships in order to enhance productivity. In their study, Kazi and Hastwell (2021) found that trusted leadership from management during telecommuting was crucial in order to successfully complete work tasks. They also emphasise the importance of workplace relationships as "camaraderie and positive culture" (n.p.) had positive effects on long-term productivity. Despite these attractive results for employers, there is more at stake than just productivity.

One strongly neglected field of research includes the effect telecommuting has on the innovation process of a firm. The most respectable study conducted on this topic was led by Coenen and Kok (2014) that studied the effects of telecommuting and new product development in several firms. In a series of eight case studies, the authors examined the effects of telecommuting on knowledge transfers, cross-functional cooperation, and inter-organisation involvement. The results found that telecommuting had positive effects on new product development as it facilitated both internal and external parties to cooperate more, increasing both the speed and quality of the innovation process. The various communication tools used by the participants were also accredited for improving the development process. Nevertheless, the authors clearly state that "a base level of face-to-face contact maintains the positive effect telework has" (p.573) with the benefit being offset if no face-to-face contact occurs. Similar to Golden's previously mentioned research, Coenen and Kok (2014) believe a balance between both telecommuting and face-to-face interactions is necessary especially during the beginning stages of an innovation process.

Coenen and Kok's (2014) research also had important insights on knowledge transfers: a key success factor to innovation. In their study, participants felt that the quality of knowledge shared would decrease if they had no physical interactions with their colleagues. Similar findings are found in another study where telecommuters mentioned their desire "for idle conversations in the hallway" (p.52) or other informal interactions leading to greater knowledge transfers (Allen, Golden & Shockly, 2015). Such findings have led companies to

scale back on telecommuting as they strive for an innovative company culture where there are maximal social interactions (Hsieh, 2013).

With telecommuting playing an increasing role in the various disciplines, more research must be dedicated to this field. The current research does not account for the variety of influences that affect the relationship between telecommuting and innovation and lacks substantial empirical evidence. More specific to the business world, deeper understanding of this topic would aid managers to make more informed decisions on the use of telework which is becoming ever more important. Current research also fails to consider the various industries and roles of individual employees which may alter the effects that telework may have as a whole. Overall, this indicates that there are large knowledge gaps in the research on telecommuting, with one of the larger ones being the influences it has on the innovation process.

2.4. Chapter Summary

This literature review provided a foundation relevant to the research question while defining the most important concepts. Due to the difficulty and magnitude of defining the term innovation, a multidisciplinary definition will be used for this research paper. By looking at innovation as a multi-stage process whereby organisations transform ideas into new/improved products, services or processes, in order to advance, compete and differentiate themselves successfully in their marketplace, we have captured the most important factors of innovation.

Closely related we conceptualised the idea of innovation capabilities and a more relevant perspective of innovation influences, specifically internal ones. Innovation capabilities play a crucial role for a firm when using its resources, employees and knowledge within the innovation process. The internal influences on innovation described from an organisation level include creativity, relationships, trust and knowledge transfers and will be the most important focus in this research paper, as they will theoretically be the most influenced by telecommuting and a missing in-person culture. These influences will also be the focal point of the qualitative data.

Furthermore, a clear definition of startups and the importance of innovation to their survival was reviewed. The interdependence between a startup and its innovations is often difficult due to constrained resources but proves existential as startups seek to develop themselves far enough to survive. Another challenge stems from startups and firms confining themselves both voluntarily and involuntarily to telecommuting. For this research paper we have defined telecommuting as a work practice that involves members of an organisation substituting a portion of their typical work hours (ranging from a few hours per week to 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. Here we established that despite the importance to managers, employees and policy makers, very little research exists on the effects telecommuting has on the innovation process. These insights are the foundation to the research paper in which we aim to answer the following research question:

How does telecommuting influence different elements of innovation from an organisational perspective in startups?

3 Methodology

The following sections within this chapter cover various important components of the methods and processes used for this research study, complemented by explanations and motivations supporting those choices. First, the inductive research approach (3.1.) will be introduced whereby the qualitative research design with its central element the ‘case study’ will be described (3.2.). Following these will be a section setting out the data collection method (3.3.), highlighting the interviews in relation to this case study, as well as a section on the quality of the research (3.4.), reflecting on the former matters. The chapter is closed by outlining the methods used for the data analysis (3.5.) as well as the research ethics (3.6.) of the study and the chosen methods to research telecommuting affecting innovation in young firms.

3.1. Research Approach and Philosophy

The research approach describes the relation between data and theory (Bryman & Bell, 2015), which for this research follows an inductive process. Induction looks at specific observations which will lead the researcher to conclusions that may be true and seek generalisations (Bryman & Bell, 2015; Hyde, 2000). The collection and analysis of data in our study are influenced by previous research and formulated theories that were examined in the literature review (Chapter 2) which we found to be incomplete in regards to the influence telecommuting has on a firm's aptitude to innovate in early stages. It will be made apparent the identified concepts serve as a guide for the interviews and analysis later in this chapter. With choosing a single case study (3.2.2.), we are viewing the case firm as a unique entity in their present stage and environment and expect that identified concepts could potentially not be applicable to this specific firm. Hyde (2000) highlights that with inductive approaches these “observations of specific instances” (p.82) must be taken into consideration to establish a generalisable outcome whereby researchers interpret their collected empirical findings to formulate and identify themes and patterns. We utilise this method of emerging theory from our collected data (Bryman & Bell, 2015) as we seek to explain the influence telecommuting

has on innovative processes for early stage companies. Furthermore, our research philosophy follows an interpretivist one. This philosophy stands in line with our research approach as it is commonly used for in depth qualitative case studies that commonly gather their primary data through interviews (Bryman & Bell, 2015).

3.1.1. Separation Approach of Personal Entities

One of the researchers conducting this study is involved with the chosen case company. Corbin Dwyer and Buckle (2009) underline in their papers that it is vital for a researcher to be aware of and understand the position that they are in (Corbin Dwyer & Buckle, 2009). Therefore, in this section, we will be reflecting on how the connection between the researchers and the case company is handled in the frame of this project to clarify our approach.

As described by Ellis (2004), Anderson (2006), and Holman Jones (2005) as cited in Ellis, Adams and Bochner (2011), the approach that aims to understand research from within through describing and systematically analysing personal experiences is called autoethnography. However, when designing our research, we decided to take an approach that opposed autoethnography. Whereby the personal involvement and emergence of the researcher within the researched field is essential for this method (Ellis, 2004; Anderson, 2006), our approach is characterised by the strict separation of the researcher as one entity and the employer as another. Since we are not looking to understand and investigate the researchers personal experience, this approach was chosen and deemed as most appropriate because it confers the highest possible degree of neutrality of the involved researcher and keeps potential bias as small as possible. Hereby, the involved researcher was not interviewed as part of the cohort and, furthermore, before each interview, the interviewees were reminded that the involved researcher was present as a student of Lund University only and not as an employee of the case company.

According to Corbin Dwyer and Buckle (2009) the prospective analytical outlook changes depending on whether the researchers' perspective stems from being an insider or an outsider. As mentioned above, an important point the authors make is that it is vital for a researcher to be aware and understand the position that they are in (Corbin Dwyer & Buckle, 2009). An

insider understands the circumstances and affairs the research group is in, whereas the outsider does not share these insights (Corbin Dwyer & Buckle, 2009). This underlines the importance for us as researchers to recognise the position each researcher is in and act according to the method chosen for this study. One of the researchers of this study is an outsider and the other is an insider. Hereby, it was decided not to act upon the insider's position of the involved researcher to provide this study with the utmost neutrality in analysing and interpreting the found data, as well as in proposing the drawn conclusions. Therefore, the chosen separation approach of the involved researcher's personal position poses as the most appropriate choice of involvement for this project with both researcher keeping to two notions strictly throughout the entire study: (1) the acute awareness of the involvement and (2) the strict separation of the two personal entities into researcher and employee.

3.2. Research Design

3.2.1. Qualitative Research

According to Bryman and Bell (2015), the most prominent distinction a quantitative study has as opposed to a qualitative one is that it employs measurement; or as Hyde (2000) puts it, a qualitative study does not make use of numerical data but rather data based on narratives. Even though these two approaches seem clearly separate in nature, they are not necessarily so in practical research (Bryman & Bell, 2015; Hyde, 2000). Both qualitative and quantitative research structures can lead to valid research findings. Qualitatively designed studies do not only, as often criticised, build the base for a following, more striking quantitative study (Hyde, 2000). To explain this a little further, the objective of qualitative research is to "explain the particular" (Hyde, 2000, p.84) as the data collected is typically rich, allowing the researcher to understand the complexity and depth of the studied phenomenon (Hyde, 2000). In contrast to most quantitative studies, the intention behind qualitative research is not to reach a generalised conclusion but rather the emphasised uniqueness of each individual case which can then be compared to broader theory; this is referred to as analytic generalisation (Hyde, 2000; Riege, 2003). Moreover, many scholars emphasise the advantages research can gain from mixing the two styles. However, this does not mean that choosing a single method leads to less valuable results (Bryman & Bell, 2015; Hyde, 2000).

As introduced in the previous section, this study follows an inductive approach, aiming to generate a theory exploring the impact telecommuting has on young companies' innovation processes. Additionally, although an inductive approach to research is not necessarily bound to a qualitative study design, it has been shown to be predominantly accentuated by it (Bryman & Bell, 2015; Hyde, 2000). Furthermore, qualitative strategies favour an independent interpretation of the social construct rather than leaning on scientific models and recognising these to be ever changing, depending on the individuals it comprises (Bryman & Bell, 2015). Given that this study aims to investigate a discrete social environment that is influenced and impacted by its members, a qualitative study appears most appropriate.

3.2.2. Case Study Design

We have elected to conduct our research as a single case study, rather than a multiple case study or survey. Single case studies have been shown to allow more in-depth study relative to other designs (Bryman & Bell, 2015; Eisenhardt & Graebner, 2007; Hyde, 2000; Stake, 1995). Furthermore, they allow theories emerging from the study to be rooted in recognised patterns from not only a singular viewpoint from the organisation but also from the internal construct within the case company; the relationships of its members which are essential for our research (Eisenhardt & Graebner, 2007). As we are looking to not only understand the general, more superficial experiences from affiliates of the case company, but also gain deeper knowledge of their more complex experience innovating in a telecommuting setting with one another, a single case study is the most suitable design choice. According to Stake (1995), there are different types of single case studies, depending on how deep or broad the sought after phenomenon is. As we use a specific case to gain a wider insight of the influence telecommuting has on innovation, our case study is of the instrumental kind (Stake, 1995).

Even though single case studies have been criticised for being a too narrow tactic, biasing results that are used for generalisation, different scholars have argued and proven that if designed meticulously and carefully, they can be successful (Bryman & Bell, 2015; Eisenhardt & Graebner, 2007; Siggelkow, 2007; Stake, 1995). Moreover, criticism on this topic is often received by researchers who are more used to working with large and numerous sources and are hence more likely to have a biased view, disregarding the benefits a single case study brings (Eisenhardt & Graebner, 2007). With our study, we are not aiming to

conclude a representative and generalisable theory. Rather we are pursuing the yield of deeper insight into this narrowly researched topic (Hyde, 2000; Siggelkow, 2007), incentivising more research in this area to contribute to the journey of developing solid theory that supports and explains the circumstances that startups must consider when undertaking innovative measures in a telecommuting work setting. Lee, Collier, and Cullen (2007 cited in Bryman & Bell, 2015) underline this aim by suggesting that this particularisation over generalisation is what constitutes the main strength of a single case study. Additionally, Siggelkow (2007) takes it a step further, advocating that this strength is what gives single case studies persuasive powers all together.

3.3. Data Collection

3.3.1. Case Study Selection

The sampling strategy for the collection of data needs to be carefully considered and prepared in order to suit the nature of the research that is being conducted (Bryman & Bell, 2015). Therefore, several sampling strategies were looked at in regards to the suitability in selecting the right data to answer the question of how telecommuting is affecting a startups' innovation processes, as well as suitability of the time and scope of this research project. After thoroughly considering these influential circumstances a combination of two qualitative, non-probability sampling methods were chosen; purposive sampling, more specifically, theoretical sampling and convenience sampling.

Due to the enhanced difficulty to find partnerships in these current circumstances created by the Covid-19 pandemic as well as limited options available under the scope of this degree project, we coupled this sampling method with convenience sampling; a non-probability sampling method where a target population meets the certain criteria set out "such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included for the purpose of the study" (Dörnyei, 2007 as cited in Etikan, Musa & Alkassim, 2016, p. 2) Therefore, convenience sampling allows us as researchers to take advantage of sample opportunities that are closer at hand that, thus, support our project timeline with fast iteration cycles, as well as fast and smooth communication between all stakeholders.

Certain limitations could possibly arise from utilising convenience sampling and being involved with the case company personally. Even though the employed researcher was not part of the interviewed cohort, they are aware of the company's situation as well as the interviewees' positions and could, therefore, attain more information than that was given. This, in turn, could lead to interpretations in the analysis section that incorporate more points of knowledge than provided by the interviewee. However, as discussed in 3.1.1. And proposed by Corbin Dwyer and Buckle (2009), awareness of the researcher's position is important and will help to counter this limitation.

According to Bryman and Bell (2015), when undertaking purposive sampling, the researcher generally does not seek to collect samples randomly but rather in a more strategic way, keeping their relevance to the posed research question in mind. They further highlight that the central aim of purposive sampling is to choose with relevance to understand a social phenomenon, in this case the effect a changed work setting has on the ability to innovate. It is important, therefore, that the criteria of selection is carefully and clearly considered, so that inclusion and exclusion of the sample are appropriate and suitable (Bryman & Bell, 2015). As mentioned above, theoretical sampling, as a more particular form of purposive sampling, was chosen. According to Bryman and Bell (2015), theoretical sampling is a controlled collection of data that is guided by the emerging theory. Therefore, the selection of the sample case was, on the one hand, guided by previous findings from the innovation, startup, and telecommuting literature review. On the other hand, it was guided by the identified gap of research surrounding those topics as well as the aims of this research to address this gap respectively. Yin (1994 cited in Eisenhardt & Graebner, 2007), furthermore lays out that this method of sampling is particularly appropriate when theory is built (or induced) and not tested, especially through a single case study as they usually pose as "unusually revelatory, extreme exemplars, or opportunities for unusual research access" (p.27).

With the sampling theory set out as foundation, the criteria directing the sample case selection was determined based on the key concepts comprised in the research question:

How does telecommuting influence different elements of innovation from an organisational perspective in startups?

***Table 3.1**: Criteria for company to be chosen for single case study*

Criteria	Details
1: Startup nature according to findings in the reviewed literature	As we chose to undertake our research studying telecommuting and innovation in a young firm, the sample case must meet the criteria of being a startup, an active, new, and independent company (Cockayne, 2019; Luger and Koo, 2005)
2: Have innovative intentions at the core of business development activities	One of the key concepts in our research question is innovation, more specifically the activity to innovate. Therefore, the case company sampled must have the pursuit to grow through innovation at its core and be closely linked to its economic undertakings (Spender et al. 2017).
3: Telecommuting work setting for a considerable amount of time	The second key concept in the research question is telecommuting which makes it crucial for the sample case company to have worked under both conditions for a considerable amount of time
4: Have potential for greatest learning outcomes	Given the boundaries such as time and word limit, selecting the right sample with the largest amount of anticipated learning outcomes is crucial. As authors we need to ensure the largest return on our investment in time and words.

After having set these criteria to be fitting to guide the selection of an appropriate case company to address our research question, we, as mentioned above, couple this step with the convenience sampling method. One of the researchers working on this degree project is employed by a startup which offered the opportunity of full access to the insights of the employee experiences through this personal connection. Therefore, this company was weighed against the criteria set to determine whether or not it was a fit for this study. After this investigation it became clear that the company reflected all three criteria that are based on relevant theory as well as the potential to provide valuable data to explain the identified research gap. Furthermore, as suggested by Stake (1995) and shown in the fourth criterion in table 3.1, the potential and anticipation of the opportunity to learn poses a big influence when selecting the case company.

3.3.2. Sonantic Limited

The case company chosen for our study is Sonantic Limited (Sonantic), a London-based startup that operates in the software industry. Their research focus is creating realistic, expressive, and emotional artificial intelligence (AI) voices, offering new solutions for entertainment studios in the realm of voice technology. Sonantic was founded by Zeena Qureshi, now CEO, and John Flynn, now CTO, in December 2019 after they met through an incubator programme organised by Entrepreneur First (EF) (Qureshi, 2021). The company is

currently in seed stage, with their last funding round raised in March 2020 at €2.3 million, backed by multiple investors, led by the Swedish Venture Capitalists EQT Ventures (Qureshi, 2021).

With regards to our company criteria outlined in Table 3.1, Sonantic poses as an optimal selection for our case study. First, with being only just over two years old, actively working independently at seed stage, Sonantic is considered a startup according to our investigated definition (2.2.). Second, the company's core activity is technological research and development, innovating new solutions in an unchartered territory (Qureshi, 2021). Third, the team has spent half its existence working in a virtual setting after spending the first half working in an office. This is regarded to be a considerable amount of time because the company has completed full product and project life cycles in both settings. Sonantic chose to give telecommuting a try from March 2020 onwards which means the team has closed full projects and development cycles in both work settings (Zeena Qureshi, interview, May 12, 2021). Lastly, after looking closer into Sonantic and speaking to the team about possibilities to collaborate, the displayed willingness to commit and support this study assured us with full trust that Sonantic was the company we could have great potential learning outcomes with with respect to the scope of this study. With all four criteria being met by Sonantic, they posed as the optimal case company for the purpose of this research paper.

3.3.3. Interview Design

For the purpose and in accordance with the nature of this study, we chose to focus on sourcing primary data through interviews which are a common and appropriate method for data collection in qualitative research more generally as well as for case study research more particularly (Bryman & Bell, 2015; Eisenhardt & Graebner, 2007; Stake, 1995). According to Bryman and Bell (2015), this commonly adopted truth holds as this method, among others, deems especially helpful in the creation of an intensive and detailed examination of a chosen case. They furthermore explain that when the objective of a study is to gather a deeper understanding of the interview participants' perspective on the relevant social construction, interviews are considered to be an appropriate data collection method (Bryman & Bell, 2015).

There are different ways interviews can be designed; unstructured, semi-structured, and highly structured (Bryman & Bell, 2015). A highly structured interview is advantageous when

one aims to strictly compare answers, in, for example, a comparative multi-case study, whereas unstructured interviews bear the benefit of allowing the interviewee not to be restrained by any frame posed by the predetermined questions, leading the researcher to findings that are impartial and unprejudiced in nature (Stake, 1995). As will be discussed further in the data analysis section, the study aims to compare the interviewees' answers but also allow them enough room to contribute their own thoughts, unbiased from strict questions that shall not give away what the study aims to investigate. Therefore, we have chosen a semi-structured interview design, allowing for guidance as well as space for direction of the interview. According to Bryman and Bell (2015), semi-structured interviews encourage individuals to address themes that the interview guide does not cover. The liberty to be flexible and to freely deviate from the original interview guide by changing the order of the questions, excluding questions, adding additional or follow up questions, or changing the wording of the questions in accordance with the flow of the interview are made possible by this interview structure (Bryman & Bell, 2015).

As explained in section 2.4. in the literature review, the term telecommuting is more commonly replaced by remote work. Therefore, for the purpose of preventing misunderstandings or confusion on the interviewees side, the term telecommuting was replaced by remote work for the interviews. An interview guide of questions was followed throughout each interview which is shown in Appendix A. This guide was designed with the concepts of innovation, identified in the preceding chapter, in mind; knowledge transfers and absorption, relationships and trust, creativity, and handling of failure and problems. In addition, questions around communication were included to complement and connect these themes. A break-up of these concepts and their corresponding questions can be found in Table 3.2 below. The exact direction of the questions within each concept bracket, as well as suitable follow-up questions, were determined by the flow of the interview to keep in line with the semi-structures design and to match the interviewees train of thought.

***Table 3.2**: Concept Correspondence with Interview Questions*

Concept Bracket	Interview Question Numbers
General stance towards telecommuting	Q 1
Communication	Q 2–5
Creativity	Q 6–8

Relationship and trust	Q 9–12
Knowledge absorption and sharing	Q 13–15
Handling of failure and problems	Q 16

Before each of the eight interviews, the verbal consent was given by the interviewees for the participation and recording of the approximately thirty minute session. Afterwards, manually created transcripts were sent to individuals upon request to assure full transparency, security and avoidance of misunderstandings between interviewers and the interviewee. Furthermore, as the subject matter of the questions could potentially lead interviewees to speak on a more sensitive and personal level, to allow for space to talk freely, the interviews were conducted in a strictly anonymous manner. This stern anonymity provided the individuals with a more comfortable and secure environment which, in turn, allowed for data collection with the most raw and truthful answers. Therefore, this study will not provide any indication such as name or job title corresponding with quotes and only refer to the interviewed individuals as ‘Interviewee 1’, ‘Interviewee 2’, […] , and ‘Interviewee 8’.

3.4. Research Quality

Ensuring a high quality of the study is an objective important to this study as well as other researchers. Qualitative research designs such as the case study design are not always accepted as a diligent alternative to more established quantitative methods (Riege, 2003). However, as discussed in the previous section 3.2.2., a study following a case study design does not always have the same aim and is thus not supposed to be seen as such an alternative (Eisenhardt & Graebner, 2007; Hyde, 2000; Riege, 2003; Siggelkow, 2007). For areas that are looking to find explanations for social phenomena such as knowledge management amongst others, which, as seen in the literature review, is a proven part of innovation, a case study design poses as suitable and will not compromise the quality of research (Riege, 2003).

To establish and assess high research quality the reliability and validity of collected data and following drawn outcomes need to be investigated (Bryman & Bell, 2015). According to Riege (2003), a “high degree of validity and reliability provides not only confidence in the data collected but, most significantly, trust in the successful application and use of the results

to managerial decision-making" (p.84). Hereby, reliability refers to the concern whether the results of the study are repeatable (Bryman & Bell, 2015) and operations trustworthy (Riege, 2003), or the consistency of the outcomes. On the other hand, validity refers to the integrity of the drawn conclusions (Bryman & Bell, 2015), or the accuracy of the outcomes. Bryman and Bell (2015) and Riege (2003) propose four corresponding design tests to establish the validity and reliability of a research matter; credibility, inspecting the believability of the findings; transferability or trustworthiness, examining of how applicable the findings are to other contexts; dependability, probing the applicability of the findings to other timings; and confirmability, checking the degree to which the researcher has allowed their values to intrude. We inspected our work and position through performing these four tests, showing the sturdy reliability and validity of our study. The conclusions are as follows:

(1) *Credibility* – Our study is based exclusively on primary sources, interviews from employee's of the case company. As the study aims to observe and explain a phenomenon within one company, interviewing 8 out of the 12 employees of Sonantic and matching their answers will provide our research with credibility. By acutely separating the researcher and employee persona of the involved party, the credibility of this research was not compromised as well. The involved researcher did not partake in the interviews as an employee and did not add additional insights or information to that of the interviewees provided.

(2) *Transferability / Trustworthiness* – The outcome of this study will be based on a thorough and deep collection of data analysis ensuring a high degree of trustworthiness in regards to the quality of the findings themselves. However, as this study is a single case study, one must recognise that transferring the finding will be limited as bias can be created when isolating data collection more narrowly (see 3.2.2.). With the personal connection standing between the researchers and the case company, the transferability of the single case study research design could be compromised through possible bias created from further insights. It must be recognised that a single case study in this area with a case company known personally, might produce outcomes that are less transferable, however, not compromised on trustworthiness.

(3) *Dependability* – As innovation is not a new concept to the world of business (Bessant & Tidd, 2015). The findings of this study will be valuable and dependable in the future as well. This holds especially true as the case company, Sonantic, works within an emerging industry, (synthetic media, more specifically, speech and voice synthesis) that is rapidly growing (Benyossef, 2020). As the highest possible degree of neutrality was kept, the dependability of this research in regards to the findings was not compromised through the personal connection.

(4) *Conformability* – Staying completely impartial is a potential limitation of qualitative research. However, the awareness of this limitation, as well as the genuine deep interest and curiosity to find a true, valuable, and unbiased answer to the research question has allowed this study to keep personal bias to the best possible minimum. Furthermore, steady impartiality can, in the case of our study, be compromised and whether to a negative or positive degree, thus, influence the conformability of this study.

3.5. Data Analysis

The analysis of qualitative data is a complex and demanding undertaking that different scholars have sought to create coding methods for universal usage of deriving conclusions from their empirical findings (Bryman & Bell, 2015; Charmaz, 2006; Pearse, 2019; Strauss & Corbin, 1990). Though different in their details, the general consensus regarding the approach to analysing qualitative data can be summarised in four overall steps: the familiarisation with the collected data, the reduction of the data into identified categories or codes, the organisation of those examined codes, and the generation of themes emerging through recognised patterns (Bryman & Bell, 2015; Charmaz, 2006; Pearse, 2019; Strauss & Corbin, 1990). Researchers must be especially meticulous when performing these steps with data deriving from interviews as they are typically a large collection of unstructured textual material which makes them not straightforward to analyse (Bryman & Bell, 2015). Therefore, the entire set of the eight interviews was manually transcribed, whereby verbal ‘tics’ and repeated words within a sentence were removed to ease understanding (Bryman & Bell, 2015)

as well as read multiple times to deepen the understanding of and familiarity with each interview.

Thereafter, a thematic analysis was performed to organise the data into codes through interpretations of the syntax within the context of the whole dialogue. Bryman and Bell (2015) state that thematic analysis is a commonly used method for the analysis of qualitative data, however there is disagreement in the academic literature on what exactly the details of thematic analysis include. According to the authors, it always generally means creating code and deriving themes from those codes which describes proceedings simplistically. First, the data was systematically searched for codes (thematic coding). Then, the identified codes were organised into categories to cluster alike codes dependent on their similarities to one another. This organisation of categories allowed for a better overview of the obtained primary data. In the final step, code clusters were inspected in more detail in order to establish umbrella themes (see coding table in Appendix B below).

These themes were first and foremost organically identified. However, to align with our findings in the literature review that guided the interview process, we utilised the pattern matching method to keep in line with our research topic and question. As per coding table, some of the identified themes are related to a priori concepts, concepts based on theoretical deduction in the literature review chapter; development of relationships, knowledge transfer and absorption, idea generation and creativity. Others emerged, as mentioned, through organic investigation; separation and autonomy, team isolation and communication.

In the following chapters we will perform a deep analysis of each of the identified themes and present the influences that telecommuting has on them and thus, the company's ability to innovate. This will begin by presenting the empirical findings consisting of these themes while citing observations from the interviews to strengthen the understanding of their emergence. A discussion will follow, connecting the findings back to the innovation theory introduced in Chapter 2 which will then lead to the answering of the research question proposed by this paper before concluding our research.

3.6. Research Ethics

Whenever conducting research of any sort it is important to follow strict ethical principles. This ensures the validity as well as the integrity of the research. When applying these ethical principles to our research paper it is important to note that the consent of all interviewees was granted. Furthermore, it is important that the authors of any research are completely transparent and show the ability to make ethical judgements. Therefore, we as authors have decided to include the fact that one of the authors is employed by Sonantic. By acknowledging this, we ensure that the possible effects on the research are acknowledged and the reasoning for such a decision is explained clearly and thoroughly.

4 Empirical Findings

This chapter presents the key findings following the gathering, sorting and analysis of the eight interviews. As shown in the coding table in Appendix B, data segments were coded and will be presented in both a priori themes developed by the literature review as well as newly identified themes that were observationally derived. These themes include the development of relationships, knowledge transfers and absorption, idea generation and creativity, separation and autonomy and lastly communication. The findings demonstrate that the five themes were influenced by telecommuting negatively, positively or not at all. For the sake of clarity, these themes will build the structure of the empirical findings and will further develop into the discussion and answering of the research question in Chapter 5.

4.1. Development of Relationships

One of the themes that emerged through strong statements from the interviewees matched a priori theme we identified in the literature review, relationships. Strong relationships and trust to one's colleagues play an immersive role throughout the process of innovating (section 2.1.2.) which makes analysing the effects telecommuting has on the development of relationships a necessary element in this study. Throughout the interviews it became evident that individuals struggle to partially establish but more so expand work relationships when working physically apart from one another. In this section we will look at where the general consensus towards relationships in a telecommuting setting lies, what the cause of these views are, and how these new ways of interacting affect the development of relationships.

Overall, individuals find that developing relationships is more difficult when telecommuting compared to when meeting people in person in-person interactions are necessary. Following quotes outline this stance:

"Just because the sense of community, the sense of friendship that you can build at work, gets diminished slightly, no matter how lovely everyone at work may be." (Interviewee 1)

"Everything is way better in person when it comes to personal relationships, welding relationships, anything relationship building really is better in person." (Interviewee 8)

"In the office it was the fact that people would meet together and have lunch every other day, having that low-level social interaction woven through all of your time. Working with somebody in that way does add up in terms of building up those relationships and knowing people a bit better." (Interviewee 3)

This led individuals to often fall back on their normal social groups outside of work. In-person interactions are found to be significant when building relationships but it is not the only factor of the equation. Team-building activities evidently play a role in the development as well (section 2.1.2.), a statement that was met with agreement in all of the interviews.

Another statement that showed consensus across the interviews was that of trust. All interviewees stated that they did not feel a difference in how much they trust their colleagues, whether they established their initial relationship in-person or virtually as shown by following quotes:

"I think that trust is something that you build over time anyways. So I would say that, yes, I trust my colleagues and that trust was built over this year." (Interviewee 2)

"Yeah, I definitely trust all of my colleagues. I don't see a huge difference there." (Interviewee 5)

There are several reasons as to why interviewees view it as more problematic developing their relationships with their fellow colleagues. These can overall be described by the lack of spontaneous social interactions, the loss of interpersonal play, and the formality when interacting. The lack of spontaneity can be traced back to the need for structuring interactions in the first place. Spontaneous interactions happen through visual cues such as seeing someone leaving their desk to get a coffee or go for a walk.

"In an office setting, you can catch up with each other a bit more, whereas the way we interact here, outside of maybe the socials where we don't talk about work, the way we interact is quite structured. When you're remote, necessarily all interaction is structured and not really spontaneous." (Interviewee 1)

"If a meeting is scheduled, things don't flow as usual. Whereas in an office, you just go for a drink or go for a walk, not putting any pressure on the conversation and interaction. I think those [small and spontaneous interactions] are the interactions that are much more like team-building. Those might seem silly but actually end up contributing a lot." (Interviewee 4)

"Structure does affect building relationships... It's more a chance thing." (Interviewee 5)

These conversations are what seems to differ, depending on whether they are born out of a structured interaction such as when telecommuting. It adds an element of formality to the exchange that cannot be shaken.

"The type of deep interactions become less fluent and it's much more scheduled. These small chats are much more difficult for online interactions and small chats make up a lot of the relationship that you end up building. It becomes a lot more formal if you do it over Zoom." (Interviewee 4)

This formality also roots from the loss of interpersonal play that individuals experience virtually:

"You don't really go to lunch with somebody, missing that interpersonal play." (Interviewee 3)

"How well you know people mainly comes from the small casual chats over lunch, or hanging out after work and all that kind of stuff. Personal relationships are affected because you're less familiar with each other about more personal things." (Interviewee 5)

Another cause of hampered development of relationships might originate from the digital meetings. Interviewees find that their capacity to pay attention is affected by not being

physically together. This can not only affect the transferability of information, as we will see in the following section, but also building relationships as not paying attention can signal disinterest to the person speaking.

> *"It means that it might feel for the other side, the person that is talking, that no one is paying attention and that the job is not really interesting or that the conversation is boring." (Interviewee 4)*

This might happen without intention, as it appears that losing attention happens rather absent-mindedly, especially when something is not directly affecting the individual. As mentioned by many interviewees, one can easily escape blame in the virtual setting.

> *"It's definitely easier to get distracted and open another window while you're waiting." (Interviewee 3)*

These outlined causes as to why forming stronger bonds between colleagues when telecommuting have various effects on both, a personal level for the individuals as well as a team level regarding interactions. It can be more difficult to grasp the feeling of belonging to the organisation as a whole and create a sense of disconnect.

> *"The human interaction of socials seems a bit less real when you're not in a room with other people. So it's kind of like that aspect of things, a bit difficult, like having meetings and communicating kind of over a video chat. Isn't quite the same as in-person." (Interviewee 6)*

> *"The people that I feel I know best are of course, the ones in my team that I have more interaction with and maybe that's due to the remote work because in the office, maybe we would spend the lunch break together with the other people, or we would have a coffee or, with office life." (Interviewee 2)*

Furthermore, these relationship development hindrances can lead to lower attendance at socials, which are in turn necessary again to further strengthen those bonds between individuals.

"But then for that, you know, like the number of people that turn up varies. Like I think some people prefer just to, you know, they're sick of zoom for that week or something like that. And they don't necessarily turn up." (Interviewee 5)

"So for me, I'm not always the best at turning up to those. I enjoy it when I go, but I find it's not as good as in-person basically. But in terms of relationships with people, I think there is potential to kind of get siloed, into talking to the people you work with the most." (Interviewee 6)

Lastly, these difficulties are also reflected in the overall feeling interviewees showed towards the kind of relationships they are building with their colleagues. Whereas when in an in-person setting, it was said that you can easily make life-long friends at work, it becomes tougher to do so in this new work setting. Interviewees described this phenomenon as "less friendship, more business" which mostly roots for the structured virtual set-up that does not allow for spontaneous casual one-on-one meetings.

"I think the relationships are all still positive, but they're just more business focused. The friendly chit chat is there, but it's always shorter and less. I suppose, we have lots of group sessions, but we don't have a huge number of one-on-one chats. That's the thing that has taken the main hit, the one-on-one chats." (Interviewee 5)

"Usually when you're talking to somebody, it's either in the five minutes before a meeting starts or in a business context." (Interviewee 3)

Interviewees showed consensus in awarding Sonantic with the obvious effort made to plan and make these more casual interactions happen in this new work setting. This effort will have contributed to individuals at the company overall feeling as though they still have a good relationship with their colleagues whom they can trust, even if these relationships could potentially be stronger on a personal level.

"I do think there's been a more conscious effort made as a result of being remote. But I don't think it's been overdone and probably, before we were remote, we weren't doing enough of it." (Interviewee 1)

As mentioned before, well built relationships between team members that share a goal to innovate is important. The collected data through all interviews let the pattern emerge that telecommuting does result in these developments to be weakened. However, trust seems to not be affected, as well as the business or working relationships individuals share within the company.

4.2. Knowledge Transfers and Absorption

One of the a priori themes was related to innovation and more specifically knowledge transfers and absorption. Throughout the interviews it became clear that telecommuting had various influences on this matter. The four main reasons include loss of concentration in zoom meetings, congested communication mediums, isolation of work groups and better note taking practices.

Throughout the interviews it became apparent that individuals were losing concentration more commonly throughout zoom meetings when compared to in person. The first reason included the unobservable nature of telecommuting. Many individuals found themselves distracted on their phones, other websites or in work related tasks which was considered less rude then if that was the case in person.

> *"In a way I'm perhaps guilty of it, to just coast a bit in a meeting. You just sit there and just be on a different window. You can be checking something else, whereas perhaps in in-person meetings, it seems a bit more rude to do that." (Interviewee 6)*

> *"Yeah, you can get away with so much stuff on video, right? You can turn off your video and eat food. If your phone buzzes, you can look. But if you checked it in front of someone's face, that would be terrible." (Interviewee 8)*

Closely related to this was the less interactive nature of zoom meetings. This left individuals uninvolved and more susceptible to losing concentration. When comparing in person meetings to online meetings one individual remarked:

"Everyone's having some lunch and it becomes a little more interactive. It becomes a little more something that sinks in, because essentially you have to do it and it's face to face. Whereas right now, in many cases 99% of the people, whenever they're not presenting or talking, they just don't really pay attention." (Interviewee 4)

Individuals also highlight the issue of online meetings only facilitating one person speaking at a time. This also affected the contribution of some individuals within the meetings.

"In zoom conversations, only one person can talk at a time. It can't support the other person trying to speak and as such, whenever you might have multiple people trying to have different conversations, it's much more difficult." (Interviewee 4)

"You don't want to speak over people. You might be ratisant about saying necessary everything you might want to. I feel that's an unsolved problem about remote work, it's very difficult." (Interviewee 6)

"It's my opinion that zoom calls and video calls are at their best when they're, one-to-one. They're most like human interaction when they're one to one. As soon as you add in people, then the delay between speaking starts to take effect. People take turns and it all starts to change." (Interviewee 7)

The consequences of these findings are significant for knowledge transfers and absorption and ultimately the innovation process. Meetings should be an interactive ground for sharing ideas, communication and active listening. Online meetings seemingly fail to mimik the multiple conversations and contributions that may flow more naturally within an in person setting. This may impede the possibilities for individuals to share and absorb specific knowledge fragments with their colleagues.

Another limiting factor includes the communication mediums used to transfer and absorb knowledge. Here individuals mainly mentioned the use of Slack and Notion as a tool to share information. Important to note is that Slack was also used when Sonantic was working in person.

"Similar stuff in the office. We would still share on Slack." (Interviewee 5)

Although still claimed to be effective, a large difference was discovered between the way Slack was used to share and absorb knowledge in person versus while telecommuting. Firstly, the threshold for sharing knowledge on Slack seemingly increased as people were more aware of disturbing coworkers and a worry of overloading the communication channel existed.

> *"There's probably a higher bar to which you would then bother to share it. The kind of serendipitous side stuff is less common to be shared." (Interviewee 5)*

The consequences of this is that although important information is shared like usual, lower tier information or even fun and informal interactions are hampered. This limits the formal and informal sharing of knowledge.

> *"I think what's important and needs to be shared would be shared in both contexts. And that's fine, but I think the creative, low-level stuff, I think there's probably just more friction." (Interviewee 5)*

> *"I still do drop some ideas and seek it out, but it's potentially a bit less, it seems a bit more focused to work. Whereas the 'This is cool' or 'I found this' stuff, there's probably less because it feels like there's so much stuff going on in Slack and messages or you don't want to spam it with too much stuff." (Interviewee 6)*

These findings could have significant implications for the innovation process as small fragments of information can lead to spontaneous idea generations or be crucial pieces in the long run. By holding back on these lower tier information flows, small bits of information that may have been shared in an office environment may have had a different innovative impact. One individual even remarked:

> *"I think sometimes sharing things that maybe aren't crucial, but are interesting, is quite valuable in the long term. I think what's been lost is the more casual, smaller stuff, which may not be directly important right now, but might feed into ideas down the line." (Interviewee 5)*

Another finding more specifically related to the absorption of knowledge included a change in the reception of shared information. Although very dependent on each individual, people did have a different reception to information shared on Slack while telecommuting compared to when they were in an office.

> *"Yeah, but I guess you have more autonomy over what you get to consume. The idea that somebody could spend 15 minutes talking about something at lunch. The only difference now is you can choose whether you want to read it or not to be very mean about it." (Interviewee 3)*

> *"I think I don't always dig in completely. And I kind of sometimes assume that if it's important, it might be brought up in a meeting." (Interviewee 5)*

Although not significantly different to an in person culture, individuals seemed to be less inclined to engage with information that was shared. Individuals mentioned that talking about it informally over lunch or in hallways helped them process the information. Overall this may suggest that the reception of knowledge ends up being less effective and negatively influences the innovation process when telecommuting.

> *"If there was something that someone shared, I'm thinking of a GitHub report I just saw someone share recently that I briefly looked at, but if you ask me now exactly what it did, I would probably not be able to explain it very well. Whereas if I'd see the person who shared it in the office, I might have said, explain that to me. I may have gotten just a simple explanation from them, and that would have been more fruitful than trying to flick through the link." (Interviewee 5)*

Another recurring factor influencing knowledge transfers and absorption within Sonantic included the isolation of work groups. Similar as to be discussed in section 4.4. individuals were isolated on a larger level, namely the people they work with closest.

> *"I think there is potential to kind of get siloed into talking to the people you work with closely the most." (Interviewee 6)*

This comes both naturally and as a direct consequence of telecommuting. Naturally, individuals spend more time with the people they work closest to as they interact in more frequent meetings or other forms of communication. However, telecommuting does lower the already fewer interactions with other work groups. This is a result of fewer spontaneous collisions and interactions that were more likely to occur in the office space. Individuals at Sonantic also relied more on overhearing or seeing current tasks or issues from other work teams, which is less common when telecommuting.

> *"I think there will always be some disconnects just because we just work in different departments. But then again, if we were in the office and we were all there, I could just be like "oh, how's this thing going?" And then you can talk in the casual chat." (Interviewee 1)*

> *"I just see people, on that side, way less than I used to." (Interviewee 5)*

As a result, there were direct consequences related to this influence. One individual felt that understanding one another's current tasks or projects can help to prioritise and speed up certain work related outcomes.

> *"Everyone is a lot more siloed. We can put some examples where, for instance, the Machine Learning team would be much quicker on doing some stuff or the engineers would be much quicker on doing some stuff if they constantly saw the pipeline that we have." (Interviewee 4)*

Another individual brings to attention the potential issue of information not being shared at all outside of the relevant work group and the discontinuity accompanied with that.

> *"Sometimes I'll think that, oh, I thought that there was this data issue and then that there wasn't one or vice versa. And sometimes a problem will be flat to me, even if the research team had known about it for a while, for example. There can be discontinuity sometimes." (Interviewee 1)*

Despite these challenges there were also positive remarks on the influence telecommuting has had on the absorption and transfer of knowledge. The interviews indicated a positive response

to note taking and archiving that seems to support the accessibility of knowledge throughout the company. All individuals stated that the note taking process was either similar to office work or even better.

> *"So I remember having in-person meetings then as we do, we kind of have that notion kind of date and content. That was happening then. So in terms of that, it's very, very similar." (Interviewee 6)*

> *"We definitely do more note-taking now remotely. Yeah. Which I think is good to just have a written record. I just went on holiday. So coming back, it enabled me to read through what had been going on." (Interviewee 5)*

A direct result from better note taking practices while telecommuting included the ability to gain a general overview of what is going on in the company as well as in other departments. This may act as a compensation to the previously discussed isolation of departments and the missing interactions. This would therefore counteract or even exceed the negative influences on knowledge transfer and absorption although to which scale remains unclear.

> *"Yeah, I think it's because everyone is very open right now. Everything is very public. So you have the roadmaps, you see what people are doing on a weekly basis." (Interviewee 4)*

> *"So at least there is a record there, of what kind of conversations people are having, because when you're in person, you sort of have an intuitive sense of what, who's talking to who about what, what people are working on, just because you can kind of look around and see them. So there are definitely ways to circumvent not having that. There are definitely ways to remotely allow people to kind of keep that level of contact." (Interviewee 3)*

Another aforementioned benefit of thorough note taking practices while telecommuting include that ability for individuals to retarce various bits of information. These ranged from meetings, strategic decisions, all the way to articles and research. This would imply a positive influence on knowledge absorption as individuals had more opportunities to interact with the information as well as having a place to refresh their memory in case needed.

"Just to be able to scroll back through the technology channel and find that article and bring it up is probably more useful than if somebody was just chatting shit over lunch. It's all a bit more archived. So the idea that if you want to know when a decision got made, chances are, you can pour through the archives and find why it was made and who made it, which is useful to have and will probably be lost if you're only meeting in person and not diligently taking notes." (Interviewee 3)

"It does mean that I can go back and see stuff, if I don't remember something that I have to do or that it was important to say in that specific context about the meeting, I can go back and look at it. It's something that I do, it's important and it helps." (Interviewee 2)

As a result of telecommuting, better note taking and archiving practices in Sonantic have had a clear and substantial positive effect on the transfer and absorption of knowledge. How this finding affects the net transfer and absorption of knowledge as a whole is unknown. Nevertheless, one individual emphasized that having a documentation base is one of the key things when it comes to successful telecommuting.

"There are two key things for remote teams: one, over-communicating, making it super clear and two: having a documentation base." (Interviewee 8)

4.3. Idea Generation and Creativity

Another a priori theme that guided the data collection was creativity. Throughout the interviews we understood that creativity was part of the bigger theme of generating ideas. However, whereas creativity itself seems to not be affected by the changing work environment much, idea generation, contrastingly, has been affected to a greater extent. When asked, interviewees shared the consensus that their level of creativity has been similar in both work settings, in-person and remote. Hereby, it was highlighted that creativity depended very much on the individual and that the only aspect that was influenced was *how* they were creative.

"So it hasn't really affected me being able to work creatively." (Interviewee 1)

"If you do it from home, you just don't really have that stuff [group brainstorming sessions]. But you can do a lot of things to have a creative experience at home as well. Like reading some books and having different setups that actually make you much more creative, going for walks and all of that stuff. It becomes more of a personal thing versus like a group creative process." (Interviewee 4)

Creativity is only part of the bigger concept of idea generation and even though this element seems to not have been affected much, in the larger scheme interviewees brought out other elements that were influenced more.

"Those small interactions that happen just around the corner in the office or wherever are really interesting and actually help generate new ideas and put new stuff in motion." (Interviewee 4)

Again, it is observed that the lack of social interactions influences yet another concept making up innovative processes. The interviews have shown two different patterns of influence, one being the lack of informal interactions leading to spontaneous inception of an idea and the second being the lack of opportunity for collaboration throughout planned interactions.

Starting off with the first, the lack of informal interactions leading to spontaneous inception of an idea. Interviewees pointed out that this becomes difficult when telecommuting generally does not allow much for unplanned social interaction which makes idea generation more often than not formal and structured which can stifle the loose environment that usually encourages bouncing ideas.

"I'm sure that probably a pretty common breeding place for like little creative ideas come from the small interactions that people have kind of perchance on the day-to-day thing, the idea that someone looks over someone's shoulder and says, well, what are you working on? They explain. And you're like, oh, that makes me think we could do this instead. So anything that can kind of emulate a bit of that is going to be helpful. If anything, there's a little bit of an absence of a time where people are able to just interact with the only goal of coming up with ideas. Cause I feel like that can kind of happen a little bit more naturally when it's just like a couple of people talking casually and one person discusses something

and someone else builds on it and someone else builds on it and then it can kind of manifest itself as an idea eventually." (Interviewee 3)

"I think the main thing is you're missing the floating-my-ideas thing and potentially having less of that bouncing around." (Interviewee 5)

"I distinctly remember what those meetings [with the purpose of brainstorming] were like in person and it was very much like two or three people sitting around a whiteboard in an empty office room and thinking about different things, scribbling notes over each other." (Interviewee 3)

It became evident that social interactions often serve as inspiration for the individuals interviewed, offering them another way to generate ideas, seeing problems from another perspective.

"I would say probably slightly harder [problem solving], purely because of the communication thing, I just feel like casual conversations are quite a good way to sort of trigger ideas. [...] I just kind of have a feeling that those things are quite important for bouncing ideas around and getting inspiration, and just sort of communicating with other parts of the team as well." (Interviewee 5)

"I get inspiration from talking to people and I think that that has also been reduced, the ability to have casual chats about what you're working on, or just if you get stuck on something small that someone in the office could help with. Messaging or calling sometimes seems a bit excessive for the size of the thing you want to ask about. These kinds of smaller interactions that boost productivity towards generating ideas kind of go away." (Interviewee 5)

Looking at the second emergent pattern, the lack of opportunity for collaboration, again, interactions seem to play an essential role. Interviewees repeatedly came back to this element, highlighting its influence on different areas, including missing out on collaborative work opportunities when brainstorming. It does not appear to be impossible but makes a big enough impact to be noticed by the individuals. Earlier we discovered that when it comes to creativity, the effect of having less opportunity for collaborative work and more opportunity for

individual work, was not as strong. However, it seems to be the opposite with idea generation. Here, more collaboration is favourable as opposed to enhanced alone time.

> *"It comes down to, again, this thing of chatting to the person next to you, you can kind of turn to each other when working. There's a lot more collaboration possible. Whereas even a Slack message is already more structured than a turn to your colleague. And it just separates you a bit more, for example the moonshots, it's mostly like everyone trying their own thing individually and then presenting results. Whereas I feel like if there was more interaction between everyone, there'd be more input from the start and probably overall be better for innovation." (Interviewee 1)*

> *"Because right now it sort of feels like any innovation that's going to come, it's going to come from one person coming up with something, trying it out themselves and sharing it. Whereas there's probably a whole other subsection of thought that comes from multiple people, just chatting shit." (Interviewee 3)*

> *"I think potentially if we're in an office environment there might be more collaboration or you could be on a whiteboard or, chatting kind of brainstorming ideas. Maybe people are a bit siloed off. But essentially people would know what other people are doing throughout the day and stuff, and might be able to cross-fertilise a bit better in person." (Interviewee 6)*

Brainstorming as a team happens differently with individuals at Sonantic overall favouring a physical environment for this activity which is more difficult to replicate when telecommuting.

> *"A lot of times after those sessions [whiteboarding], you get such good breakthroughs and you can run faster." (Interviewee 8)*

> *"In terms of cons, some of the communication can be a little bit more difficult, especially when it comes to things like idea generation. Having a couple of people gathered around a table with a sheet of paper or whatever sometimes can make it a bit easier to come up with ideas." (Interviewee 3)*

Lastly, missing the collaborative environment when brainstorming and substituting these physical interactions with digital video calls and messages can be draining which can lead to less involvement in the idea generation process due to lower energy levels.

> *"You can try to do remote white boarding, but it's not the same as being in a room feeding off of each other's energy and coming up with great ideas. So in that way, like we're not that fast with ideas." (Interviewee 8)*

> *"I feel like brainstorming. In real life, bouncing ideas around is a little bit easier. Like you can just be a bit more active and motivate people a bit more. Like you can all sit around a whiteboard and you can, you know, list things out. I feel like sometimes the energy maybe was higher than in a zoom meeting, because it's a one-on-one in terms of when, or who's speaking when like interrupting is a bit more complicated, like that kind of leads to people who aren't speaking, just sort of sitting and, like, you're kind of not as involved, whereas when you're all in a room, everyone is kind of just permanently involved to some degree." (Interviewee 5)*

Idea generation processes and individual as well as group creativity are an essential part of being innovative and digital mediums seem to not be posing as solid substitutes for interactive in-person brainstorming sessions. Even though the individuals feel individually creative and productive, the full potential of idea generation seems to only be unlocked with a combination of collaborative discussions and individual sessions.

4.4. Separation and Autonomy

Although not a priori theme in our research, we discovered the recurring theme of separation and autonomy of individuals in Sonantic. Throughout all interviews it became evident that individuals were isolated. In fact, individuals seemed to have been isolated on multiple levels. All individuals found themselves to be more productive as a result of being isolated from co-workers and the distractions in an office. Individuals mentioned the common occurrences of co-workers disturbing each other's focus through interruptions in an office setting. Many other distractions also exist within the office whereas individuals telecommuting have much more control of their work environment at home. The following quotes illustrate this:

“I became a lot more productive. I'm less productive in the office because it's so easy to be like, I don't feel like doing this.” (Interviewee 8)

“Anybody could just come over and tap you on the shoulder when you're in the middle of working at any point and it completely takes you out of your focus.” (Interviewee 3)

“So getting things done, I think it's much faster, for me, it's much faster doing it remotely.” (Interviewee 4)

However, as individuals became more productive and isolated in their work space, some struggled with a work-life balance and were often consumed by their work leaving them fatigued and with less energy.

“Yes sometimes you feel like you can't separate well between work and your own time, your own evening. Especially if it's a busy time where there is a lot of work or we need to develop new ideas about general improvements. It can happen that at midnight I'm in bed already, not even where I work and I'm Googling on my phone. Separation sometimes is a bit tough or even on the weekend you still have your laptop there.” (Interviewee 2)

“Also work starts seeping into your day-to-day life in some way. It's harder to kind of separate the two and it kind of becomes a bit more consuming.” (Interviewee 5)

“They [work colleagues] are so much more productive, but at the same time, their energy dies.” (Interviewee 8)

Few individuals also brought up feeling disconnected to the organisation as a whole due to their isolation.

“It's difficult as well to create a feeling of belonging to an organisation. You only log in for your core hours and then that's it.” (Interviewee 4)

Some individuals acknowledged their responsibility in being isolated. Reasons included the initiative and effort needed to interact with other colleagues. When telecommuting,

interactions were claimed to be more structured, required more energy and were less spontaneous, quick and effective. Individuals strongly felt that telecommuting worked best alone but became increasingly harder the more interactions and people were involved.

> *"With full honesty and transparency, no, I don't do it [seek out informal interactions]. When you are in your office and you cross paths with someone, you start having that conversation. Then those small chats happen, How is it going? What were you up to last night? And did you go to the gym this morning? So it's the fact that you are seeing people and just crash into people all the time; that generates those interactions. Whereas online, you need to make an effort and consciously do it." (Interviewee 4)*

> *"Yeah, no, I don't do that [seek out informal interactions]. Also when you spend so much time on my video calls, video calls are kind of exhausting in their own way. And hanging out with someone for an hour on a video call is much more tiring than if you just happened to be having lunch together. It still wouldn't be the same so I don't really do it." (Interviewee 1)*

Overall two major influences of telecommuting on the innovation process became clear. Firstly, individuals telecommuting became much more productive when being siloed off from work colleagues and distractions. This came as a result of individuals being able to control their environment, not be interrupted and focus on their deep work. Also individuals seemed to work during off hours due to the difficulty in work-life balance. This is of significance because if the innovation originates from one's individual work then telecommuting may have a positive influence on the speed of innovation and the achievement of one's personal short and long term goals.

> *"A lot of research and innovation was done by people just on their own in offices, but it's sort of similar to remote work." (Interviewee 6)*

The second observation is that although people have become more productive, their energy levels and social interactions seem to be diminishing.

"Thursday lunch died really fast, like within a month or two people just stopped showing up. People became so isolated that they didn't even feel like doing zoom meetings anymore because it was just so overdone. Zoom fatigue is real." (Interviewee 8)

Although individuals noticed a significantly positive increase in their productivity while telecommuting, it seems to have come at the expense of their energy levels. Being fatigued has contributed to why individuals seek out less interactions and initiate informal interactions. As a result they become even more isolated. To what extent this isolation may influence the innovation process of the organisation remains unknown. However, isolation and fatigue seems to be a recurring pattern in all themes presented.

4.5. Communication

As aforementioned by one of the interviewees, clear communication can be considered one of the key success factors to telecommuting. In all previous findings, communication was one of the largest overlapping themes to the influences telecommuting has had on the innovation process. Although over communicating and expressing oneself clearly sounds easy, it is in fact rather difficult. Some of the influences telecommuting has had on communication have already been discussed in more relevant sections. These include structure versus spontaneity (section 4.1), diminishing contributions and misalignments (section 4.2), the lack of interactions and collaboration (section 4.3) and online fatigue (section 4.4). Nevertheless, some influences on communications remained untouched. These include the ambiguity in written communication and the difficulty of portraying emotions and body language virtually.

Throughout the interviews it became apparent that almost all individuals had issues with communicating online to one degree or another. There was a ride array of difficulties when considering specifically online communication. Some of the difficulties are illustrated below.

"Sometimes you can't deliver information in the right way through a video call or texts. So being in person can be really good for super quick feedback. Also sometimes very nuanced feedback that requires diagrams or things like that." (Interviewee 7)

"Everyone spends more time texting and it's not as effective as it was in the office. I mean, it is difficult in that sometimes there is an ambiguity in sending a message online. You have to be much clearer than if you were talking with that person face to face." (Interviewee 2)

A common recurrence was also the difficulty in being understood clearly over written mediums. Similarly, understanding written messages also posed a problem as many were considered ambiguous. Individuals also highlighted the importance of leaving nothing to interpretation and writing explicitly opposed to implicit.

"I would say it takes a little bit more effort to be understood. You'd have to be quite clear in the way you present your Slack messages and things like that. Slack messages can be very ambiguous, because the way Slack might flow. There's been more communication breakdown stuff like, Oh, can you elaborate on that? Could you clarify that for me? It happens more often in remote situations." (Interviewee 7)

"If you write something to someone and you miss something very crucial, then it bites you in the ass later." (Interviewee 8)

"You have to be way more linear and clear in your communication in order to get the message to the other person more easily and vice versa. Sometimes I don't understand what the other person is saying if they're a bit more implicit." (Interviewee 2)

Despite these challenges it became evident throughout the interviews that clear communication could be something learnt and practiced over time. Specifically to Sonantic, interviewees mentioned the improvements over time and their willingness to improve.

"Because we made a lot of changes when we started to work remotely and there was a bit of a teething period where we didn't get it right for the first couple of months. But I think because as we we're now taking a more of a remote first approach for communication. So, broadcasting messages on Slack, when we're writing a Slack message, making sure the right people see it, or leaving it in a place in something like Notion." (Interviewee 7)

"Because we do so many calls now we have to really learn the art of communicating clearly through our writing." (Interviewee 8)

More room for improvement when telecommuting includes the ability to portray emotions and body language. One of the findings following the interviews was the difficulty for individuals to read emotions and body language virtually. In contrast to an in person setting, individuals rarely see more than just a face during meetings. This can make it difficult for individuals to interpret their colleague's emotions.

"One thing about him is that he's quite a straight faced guy. He doesn't really emote very much when you're talking to him. So I find it very difficult to be like, is he pissed off or is he fine or is he bored or is he angry? And I feel like if you had more interaction time with someone like that in person, you might be able to get a better read on them, and better interpersonal skills with them." (Interviewee 3)

As a result, some interviewees found themselves compensating for the lack of body language and emotions. This may be a contributing factor to why online meetings are relatively fatiguing aforementioned in previous sections.

"Every time you get on the camera, you have to be a lot more animated than you are in person, because all they can see is your face. So you have to try really hard to really keep it up." (Interviewee 8)

The same individual also found themselves learning how to interpret people's face expressions. A hopeful sign to better communication in the future.

"So I've had to become a master reader of body language, even though you don't see someone's body on Zoom. And also just watching every little blink, facial expression, everything, are they wrinkling their face?" (Interviewee 8)

Communication as a whole can have a large impact on the success of an organisation and its innovation. The findings have suggested that communication does not only have an impact on the previous themes identified but consequently the entire innovation process as well. As a result of telecommuting, individuals at Sonantic have found themselves with new challenges

when it comes to communication amongst one another. Nevertheless, a continuous learning curve as well as the ability to counteract certain challenges gives hope in minimising the negative influences that telecommuting has had on communication and the innovation process as a whole. To what extent and how long these efforts may last is beyond the scope of this study.

4.6. Summary

With an open attitude to a priori and new themes, the empirical findings were presented throughout this chapter. There were positive, neutral and negative influences throughout the various themes, with the measurability of each beyond the scope of this research. Nevertheless, we have successfully identified the following:

Firstly, relationship building was hampered by fewer and less spontaneous interactions when telecommuting. However, this did not impact the trust amongst colleagues. Secondly, knowledge transfer and absorption were negatively influenced by less concentration, more congested communication mediums and the isolations of work groups when telecommuting. On the reverse, better note taking and archiving practices had a positive influence. Thirdly, individual creativity has not been influenced by telecommuting. On the other hand, group creativity and idea generations have been negatively influenced by less spontaneous and collaborative interactions. Foruthly, as a result of professional isolation, productivity has increased amongst the interviewees at the expense of their energy levels. Lastly, communication efficiency and clarity have been negatively influenced by ambiguity in written communication and difficulty in portraying body language and emotions virtually. Nevertheless, an identified learning curve and willingness to improve diminishes these negative influences. In Chapter 5, the importance and relevance of the findings and the answer to the research question will be discussed in more detail. Then, the research aim, objectives, limitations and suggestions for further research will be presented to conclude this study.

5 Discussion and Conclusions

5.1. Discussion

As we organised and analysed the data collected in the interviews, similarities across the themes were spotted. These identified umbrella phenomena emerged from the empirical data; we will call these 'patterns' which will be discussed further in this section. Hereby, we will take previously displayed learnings, connect them with said patterns, and reflect on theoretical findings outlined in the literature review. The empirical findings show the influence telecommuting has on the different themes of innovation. We have identified that these found effects are driven by three different overarching patterns; spontaneity versus structure, individuality versus collaboration, and levels of energy, concentration, and attention. In addition, general communication and interactions act as a constant throughout all themes and patterns, guiding the influence telecommuting has on them whether positive, negative, or unchanged.

Before discussing those patterns and relation to a company's ability to innovate, we want to highlight that all of the themes and patterns conceptualised are not to be considered as binary and isolated, but rather as a part of a complexity in which they are tightly interconnected. This reflects the nature of innovation and its components as described in Chapter 2 (Adams, Bessant & Phelps, 2006; Baregheh, Rowley & Sambrook, 2009; Bessant & Tidd, 2015; Francis & Bessant, 2005). To recall, as examined in the literature review, the definition of innovation, innovative processes and capabilities, as we as its influences are by many scholars described to be notoriously ambiguous and not clearly and universally defined which makes the composite interconnectedness of our findings unsurprising. While we investigated the impact telecommuting has on each of the themes, as displayed in the empirical findings section, it became clear that the changed circumstances of one theme were also impacted by the changed environment of another. To make this more clear, the findings do not just show how a theme is influenced by telecommuting but also that it is influenced by another theme being affected by telecommuting; the increased personal productivity incentivises autonomy

which can play a part in harming the fostering of stronger relationships through less interactions which can discourage fluid communication leading to spontaneous idea generation, and so on.

Having now proclaimed that telecommuting is influencing these different themes, the debate as to *how* it influences innovation remains to be answered in the following sections.

How does telecommuting influence different elements of innovation from an organisational perspective in startups?

This leads back to the line of thought introduced in the beginning of this discussion; in the empirical findings we have shown *what* has been affected whereby the overarching patterns will explain *how*.

5.1.1. Spontaneity versus Structure

A recurring element that was brought up by every interviewee throughout the conversations held with them was how telecommuting and the necessary use of digital communication tools forces structure onto interactions and communication at the cost of losing spontaneity. This lack of spontaneity through necessarily imposed structure influences various themes of innovation across all-encompassing. Three of these concepts that were identified to heavily impact the innovativeness of a young company were the transfer of knowledge, the ability to be creative, and the building of strong relationships within the team (Bessant & Tidd, 2015; Karlsson, Johansson & Norman, 2013; Wong, Tjosvold & Liu, 2009). The literature, as presented in section 2.1.2., supports that fostering positive and strong relationships can enhance working creatively by creating an encouraging environment for its participants (e.g. Bessant & Tidd, 2015; Wong, Tjosvold & Liu, 2009). These encouraging environments also motivate individuals to share more with the groups due to built trust between one another, whether that would be an idea, opinion, or piece that could encourage, influence, or inspire someone else (Bessant & Tidd, 2015; Coenen & Kok, 2014; Taskin & Bridoux, 2010; Aas & Breunig, 2017).

We found that trust, the absorption of knowledge, and individual creativity, specifically, have not been affected by this different work setting in accordance with what interviewees

reported. In fact, the diligent note-taking culture, creating archives comprising carefully documented notes of everything, seems to be a very helpful tool as reported across all interviews. This leads up to the assumption that there should not be much of an effect telecommuting has on innovation. However, we have also seen that the loss of spontaneity due to the inflicted structure makes it generally more difficult for individuals to connect to their colleagues on a more personal level which they labeled as *less friendship, more business.* This gives way to the conclusion that even though individuals feel like they do have a trustworthy relation that does not interfere with their work to one another, various confessions show that these relationships are more difficult to foster under telecommuting which, as per theory, hampers the strengthening of group potency. Therefore, the structure telecommuting brings can harm a company's potential to innovate. Conversingly, strong relationships motivate individuals to interact even more in spontaneous and informal settings which has shown to fuel idea generation as described by various interviewees and preceding literature. To counteract this loss of spontaneous interaction, the company can try to organise these casual meet-ups which, however, again leads to structured and formal conditions; conditions that are found to be discouraging casual conversation.

This creates somewhat of a dilemma. Where individuals regard spontaneously born interactions as high when it comes to generating ideas, building relationships and, hence, innovating, telecommuting needs structure to adapt and compensate for missing elements that come naturally in an in-person setting. The created continuous cycle of loss of spontaneity due to structured interactions which are put in place to offer settings that are supposed to encourage spontaneity but are ultimately left to be the opposite, are a crucial element in understanding the influence telecommuting has on innovation. This dilemma is further fueled by the little to no initiative interviewees reported to feel in regards to instigating casual interactions over digital mediums.

As described by different individuals, the loss of opportunities to just simply bounce ideas without formality or pressure hovering over the interaction is lost in this work setting and difficult to replicate, leading to a less confident group identity and group potency. As aforementioned, the theory says that individuals in a more confident group are more likely to find themselves more efficient, proactive, and persistent in group work efforts which enhances an innovative environment. Losing spontaneous interactions hampers fostering of

relationships, leaving the group less confident and individuals less functional when innovating (Wong, Tjosvold & Liu, 2009).

5.1.2. Individuality versus Collaboration

Another pattern that emerged across the themes presented in Chapter 4 is the one of individuality versus collaboration. It became apparent throughout the interviews and organisation of the collected data that different themes seemed to be affected by telecommuting from a group perspective but not as much from a personal one. Furthermore, even though all themes were identified by statements from various interviewees, it is important to note that this majority did not include everyone's perspective, leading to the conclusion that the perception and effect of telecommuting is dependent on the individual itself. Overall, we found that individually, participants were coping better whereas collaborative interactions were the ones difficult to maintain over digital mediums.

We have established the importance creativity plays for innovation and as discussed above, the structure inaugurated by telecommuting can generally harm creative processes as they are fueled by stronger relationships. However, throughout the interviews we found that there is a clear distinction between group creativity and individual creativity. Whereas the above mentioned one refers to group creativity, fostered by relationships, personal creativity has shown to not be affected nearly as much. Interviewees reported that either their individual capacity to be creative has not changed much at all or they have adapted ways through which they allow themselves to be in a more creativity-stimulating setting. This finding opens up for more dependencies in regards to the influence telecommuting has on innovation when it comes to creativity. Is the innovative process in a company strongly dependent on multiple individuals working on the same project, innovating closely together, the impact telecommuting has tends to be more negative, as opposed to the space to innovate a group experiences in an in-person setting. On the other hand, if the company's innovation process is split up into stages, led by individuals rather than by a group, the effect on creativity seems to be much smaller.

Accordingly, the distinction appears to be fairly straightforward. But, as this pattern does not just appeal to work as an individual versus work as a group, but also the individual preferences people have, it becomes slightly more complicated to examine the influence on

innovation regarding creativity. The above shown distinction is based on individuals being able to fully adapt their personal ways of being creative in a telecommuting setting as opposed to an in-person setting. However, even though the general consensus was found to be more neutral, some interviewees stated that while they can and have substituted their ways, they still found it to be easier and more stimulating when being surrounded by others. The outlined theory and empirical findings can display a generalised view, shared by the majority of the participants, when it ultimately depends on the individual's preference. One interviewee stated that they draw inspiration from simple conversation about anything really within a short and casual encounter, whereas others drew their inspiration from reading, for example. These smaller and more detailed questions emerging play a more prominent role for smaller companies than larger ones to understand the exact roots of creativity for the company as a whole and for its individual.

This individual preference view does not only affect the influence telecommuting has on innovation in regards to creativity. As discussed above, the overall impact in the development of stronger relationships is more negative, due to the loss of spontaneous and casual interactions and decreased motivation to initiate such over digital mediums. However, the more detailed questions arise here again, how likely are individuals not to initiate? How strong is the effect it has on building relationships for the individual? Throughout the interviews it became clear that while there is a generally more negative influence, however, how strong this negative influence was perceived by the interviewees depends, again, on the individual. Some interviewees seemed to be more affected than others, finding it easier to cope with talking and casually interacting when telecommuting while others struggle more.

To conclude this section, when looking at the influence telecommuting has on innovation, it is important to identify the individual and group elements in the company. A firm is made up of different individuals which makes their personal preferences crucial in understanding the exact influence a work setting can have for the innovativeness of the company as a whole. Furthermore, the nature of the innovative activity a firm undertakes is an important part of the equation as well; is this innovative activity performed as one task worked on by everyone in the team or is it broken up in different steps that individuals work on? This more detailed identity of a company’s innovation is reflected as well in the findings introduced in the literature by Aas and Breuning (2019). They state that innovation capabilities depend on understanding the exact resources (root of a firm's innovation identity) in order to innovate to

the best potential. Lastly, as this paper focuses on young companies and the case firm being a startup, we further conclude that this pattern poses as even more important. Young firms are composed of fewer employees which attributes each individual with a relatively larger stake, influence, and weight in the innovation process.

5.1.3. Levels of Energy, Attention, and Concentration

The last overarching pattern that we have identified throughout organising and analysing our empirical findings is the one of changing levels of energy and concentration. Forcingly interacting with work colleagues via a digital medium through text messages, audio calls, and video calls seems to impact this area and different themes of innovation. As in correspondence with the pattern described in the previous section, the perceived and experienced level of concentration, attention, and energy is heavily dependent on the individual. While some interviewees reported to be heavily affected by the so-called *zoom fatigue*, others seemed to be coping with the different, digital environment better.

Most individuals experience a loss of energy and lack of concentration in regards to interacting online which is reflected in the decreased motivation to interact in online meetings, to attend non-compulsory online meet-ups, and take the initiative to seek extra interactions to casually catch up, for example. We are not tracing the level of impact of the phenomenon back to the individuals personal preference alone but also their position within the company and job itself. Interviewees holding a position that requires more autonomy due to the nature of their job are found to be less affected by this element than individuals having to interact more with other colleagues. Nevertheless, what does this mean for innovation? Overall, feeling less energetic and having difficulties holding attention in meetings can lead to lower levels of contribution as described by various interviewees. That, in turn, affects different themes of innovation as follows.

The importance of strong relationships and resulting high group potency has been shown to lead to enhanced innovative capabilities as described by Wong, Tjosvold & Liu (2009) (section 2.1.2). The theory on establishing and developing relationships is built on continuous interactions. Therefore, less motivation to do so due to the lack of energy to take initiative and effort to link up when using digital mediums ultimately affects relationships-building and the ability to innovate to the best of a company's abilities as well. Low energy levels in regards to

online interactions that result in less organic contributions, thus, also impact the amount of knowledge that could potentially be transferred in interactions, which, again, has shown to be an integral part of innovating. Lastly, these low energy levels caused by digital mediums influence the creative parts of innovation such as getting inspired and brainstorming more negatively. Again, this can be connected to the reduced contributions as described above but also to the amount of people present at a meet-up. Interviewees reported that their zoom fatigue seemed to increase with the number of attendees. Sequentially, this can have ramifications for a group's collaborative work session to brainstorm or solve a problem which turns into a dilemma. A meeting might demand the attendance of more people that were involved in a project that needs to be discussed, however, that number of people potentially discourages conversations, contributions, and other interactions simply due to the fatigue inflicted by the sheer amount of individuals on the call.

Furthermore, interviewees also stated that their capacity to pay attention is, even though dependent on the individual personal inclination, overall lower when compared to in-person meeting as described in the empirical findings. This impact of telecommuting can, again, affect different themes of innovation. Lower attention levels lead to taking in less information and contributing with less to the meeting which means that the transfer of knowledge can be negatively affected. It also creates a less collaborative environment affecting the development of relationships as well as group creativity which refers back and is tied to the first pattern presented in this discussion.

On the other hand, paying less attention in group settings translates to individuals having more time to work on their individual task, increasing their personal productivity. Said increase in personal productivity is not only fueled by offering up more time to work on individual tasks by giving up one's attention in a group interaction. General concentration and energy towards their own tasks was found to have risen which is shown within the empirical findings (4.4.). Interviewees disclosed that opportunities for getting distracted were far smaller when telecommuting which led to being able to 'get into the zone'. Individuals reported to be able to concentrate without interruption for longer periods of time, increasing their speed of work and overall productivity. Especially for people that have a job that requires these concentration-intensive periods of time, telecommuting has shown to work in favour for them personally which begs the question as to how heavy the employee's personal productivity weighs in a company's innovation process. We will look further into these gaps

that opened up within our research in the following section 5.4.2. where we will suggest topics of further research.

5.1.4. Concluding Thoughts

Now that we have presented both themes of innovation and patterns showing how these are influenced in detail, we are able to reflect upon our research question proposed by this paper:

How does telecommuting influence different elements of innovation from an organisational perspective in startups?

We have seen that innovation is a complex concept that is not only difficult to define but also very intertwined when it comes to its roots that it is made up of. Nevertheless, this study has evidently shown that telecommuting influences the internal elements of innovation. Overall, we have seen that there are some neutral and positive effects as well as negative ones. Where, on the one hand, concepts such as trust, knowledge absorption, and personal creativity haven not been much influenced by telecommuting at all, individual productivity has shown to increase. On the other hand, building stronger relationships, fostering group potency, collaborative creativity, and the transfer of knowledge have shown to overall be impacted more negatively.

However, these findings appear to be firmly dependent on other factors such as the employee's individual preference towards interacting, working with the team, and doing their own work, as well as the exact nature of the innovation process itself. With an innovation process more heavily reliant on group interaction, the influence of telecommuting weighs more and should, therefore, be accounted for more. Whereas with an innovation process less dependent on collaboration and more so on the individual's capacity to contribute in a more isolated step of the overall process, the influences of telecommuting seem less substantial as some negative effects can be balanced out by the increased individual productivity by the employees.

Lastly, the discussion has shown that one cannot investigate the different elements, roots, and influences of innovation isolated from each other. Innovation is a greatly complex concept with its themes being heavily interconnected and interdependent. While the exploration of the

effects telecommuting has on it in younger firms partially seems clear, it opened up a so-called rabbit hole in other areas, calling for more detailed and explicit investigations which will be picked up in the following section 5.4.2..

5.2. Research Aims & Objectives

The aim of this study was to better understand the influences telecommuting has on the organisational processes of innovation in a startup. More specifically our research question was:

How does telecommuting influence different elements of innovation from an organisational perspective in startups?

From the eight interviews conducted we were able to establish five themes that were presented in Chapter 4. Three of the themes established are a priori themes that were discussed within the literature review. The two remaining themes were identified while gathering, sorting and analysing the interviews. Overall, we found both positive and negative influences on the innovation process as a whole. To what extent one influence outweighs the other is beyond the scope of this paper and left up to interpretation. The discussion above also helped us in our aim by examining overarching insights in relation to various elements of innovation.

Similarly, our paper had specific objectives. The first included collecting and constructing a holistic overview of research that existed on both innovation and telecommuting. This was achieved in Chapter 2 where a literature review presented and constructed a holistic overview of the relevant key concepts, ideas, theories and previous findings. Closely related to this we aspired to clearly define telecommuting in order to set clear boundaries for our and future research as the topic is filled with inconsistency. This was achieved in section 2.3 where we both defined and set boundaries for the term telecommuting. Our final objective was to develop insightful findings and discussions that would spark incentive for further research. We have fulfilled this objective in Chapter 4 and 5, where we presented and discussed our findings as well as provided suggestions for further research in section 5.4.3.

5.3. Limitations

The existing research on telecommuting is limited and often contradictory as discussed in section 2.3.1. We ourselves realised the difficulty of researching such a dynamic topic and were susceptible to various limitations that must be acknowledged. The largest limitation came from conducting our research amidst a global pandemic. Although this was indeed an opportunity to research full time telecommuting, we acknowledge the large impact the pandemic has had on people's mental health, social interactions, and their work-life. This may have influenced the interviewees perspectives in unknown ways and dramatised certain influences that telecommuting had on the innovation process. The second limitation of the study comes from the limitations within the methodology. Although single case studies are a desirable approach to research by gaining unique and more intense insights (Bryman & Bell, 2015; Siggelkow, 2007), they are accompanied by various limitations. These limitations include that our findings are not fully replicable to other companies and were affected by industry specific factors. Sonantic is in both a very innovative and niche industry. Furthermore, we acknowledge that our research does not have the ability to draw generalisations. Another limitation stemming from our methodology concerns the use of secondary data. Due to the youthfulness of Sonantic, no available reports, and the personal nature of this case study, our research did not include any secondary sources. Finally, we acknowledge any biases we may have had as authors. Although the association of one author to Sonantic brought many positive aspects to the study, we must also acknowledge the potential limitations it accompanies. Despite intentions and approved methods of collecting, handling and analysing data neutrally we acknowledge the human nature of underlying biases that may have influenced our research.

5.4. Research Implications and Future Research

5.4.1. Theoretical Contribution

From a theoretical perspective, our research paper has various implications and contributions. Firstly, we have reinforced the findings of previous literature that telecommuting has a

positive influence on the productivity of individuals. Beyond the aspect of productivity, our findings have also reinforced that knowledge transfer is influenced by telecommuting and that individuals long after social interactions. Our research has not only successfully brought attention to a relatively large research gap but filled the gap ever so slightly with a successful research paper. This paper gave a strong holistic overview of previous research while identifying five key themes that influenced the innovation process as a result of telecommuting. Additionally, our discussion has identified overarching themes that are at the core of the influences observed within Chapter 4. Although our findings suggest that telecommuting has both positive and negative influences on the innovation process as a whole, we have also implied much room for further exploration. We hope that the contributions of this paper have inspired further research in this widely understudied aea. Finally, by setting clear definitions and boundaries on our research we have promoted a more consistent approach for future researchers and their quest of understanding telecommuting better.

5.4.2. Practical Implications

We believe our research paper also has significant contributions and implications from a practical perspective. Through this successful case study we have raised awareness on the potential positive and negative influences telecommuting has on individuals, the organisation as a whole and its innovation process. These influences often acted as counter balances and would therefore imply what practical considerations must be taken when telecommuting. We have contributed awareness of these influences for both employees and managers and advise them to constantly learn, communicate and improve on their telecommuting journey. Finally, these valuable insights have also given room for improvements on telecommuting technologies, leadership and the successful practices of telecommuting.

5.4.3. Suggestion for Further Research

Following the theoretical and practical contributions of our paper we see much room for further research. Firstly, we believe that a multi case study would benefit the research on telecommuting in order to establish relevant theories. This research should be conducted on a larger scale within a wide variety of industries. We also encourage future researchers to

branch out beyond the influences of telecommuting on productivity in a way similar to us. Understanding the influences of telecommuting beyond an individual's productivity has given us valuable theoretical and practical insights and has proven to be a fruitful avenue of research.

Throughout our research we have also gotten a belief that telecommuting and office work functions best when combined in some sort of a hybrid solution. We believe future research designed to explore the middle ground of the two options would be beneficial in many ways. We also believe further research would benefit by better understanding the patterns identified within the discussion. Examining to what extent some of the patterns influence the innovation process could help suggest practical solutions to the challenges described. Finally, our research has been focused on an organisational perspective. Inquiring the influences telecommuting has on innovation processes beyond the organisational perspective would open up new possibilities for even more insightful research.

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Appendix A – Interview Guide

Introduction (Max)

- First of all, thank you so much for agreeing to participate and helping us with our research. We are Rikki and Max, students at Lund University undertaking our bachelor thesis project on remote work and its effects. This interview acts as part of the data collection for our dissertation.
- Before we start, please note that all the answers given are strictly anonymous and will only be used for the purpose of this study.
- Also, if you should not want to answer any of the questions asked, that is perfectly fine and we can just move on. Some questions might overlap, and due to time restrictions, we might have to cut short on some parts and move on to the next section, just so you are aware of why, in case it happens.
- When answering the questions, please try and relay your thoughts in regards to your experience with Sonantic and in comparison, where possible, with experiences working in the office.
- With that being said, we would lastly like you to verbally confirm your consent for your participation in and the recording of this interview. ….

General (Rikki)

1. **What are your general thoughts on working remotely?**
    - Do you find remote work stimulating? More or less than before?
    - Are you personally experiencing any advantages/disadvantages to it? Preference? Why?
    - Where do you see the differences generally from working in-person to remotely?
    - Do you feel professionally isolated? How has that impacted you?

Communication (Rikki)

2. **What communication mediums do you use at Sonantic?**
3. **Do you feel like you have a good overview of what is happening with the company generally and in other teams?**
4. **How has your attention capacity differed between virtual and in-person meetings?**

- Why? How come?
- Do you feel like that affects the transfer of information within and across the company?
- Does this affect your contribution to the meeting?
- Do you feel held back to speak up?

5. **Do you feel note taking is affected by this digital culture? Do you feel one of the settings keeps better track of things through notes?**
    - Does this affect your understanding and awareness of what is going on?
    - Does this affect your own work? If yes, how?

Creativity (Max)

6. **How are you personally creative? Is there a difference before and after remote work?**
    - What tools/aids (brainstorming, mind mapping visualisations) do you use more than before? Which ones less?
    - Do you like brainstorming more individually or in a team? How does that apply to the work settings?
7. **Do you feel like Sonantic gives you time and space to be creative?**
8. **Is there anything that blocks you from being creative?**
    - How does it compare to working in an in-person setting?

Relationships & Trust (Max)

9. **Do your relationships differ depending on if you've met the person face to face vs not?**
    - Do you feel like that affects the quality of the relationship with your colleagues?
10. **Do you have team building activities?**
    - If so, can you describe them?
    - How has that changed to before remote work?
    - What do you think about virtual team building activities?
11. **Do you proactively seek out-of-work social interactions?**
    - Ex.: informal conversations, catching-up, meeting up, online games, etc.
    - How has that differed between an in person setting vs remote?
    - Do you miss casual coffee / lunch break?
12. **Do you trust your colleagues?**

Knowledge absorption and sharing (Max)

13. How do you access/accumulate knowledge from outside the company?

- Research papers? Articles? Youtube?

14. How do you share findings that could help the team?

- Do you take in (read, listen to, watch) things other people share? If so, to what extent? Is it discussed?

15. How do you use useful findings in your job?

Handling of failure and problems (Rikki)

16. Do you feel like failure is part of your process as a team?

- How do you deal with failure?
- Do you have meetings about it?
- Do you feel it is addressed enough?
- Difference to in-person to now?

Appendix B – Coding Table

Separation and autonomy		Transfer of Information	Communication
Professional Isolation	Less stimulation at work	Distraction in virtual meetings	Discontinuity and misalignment
	Loss of physical separation of homework	Centralised information archive	Necessity of meticulous communication
	Less motivation to start work day	Structured sharing of ideas	Fatigue from digital mediums
	Difficulties separating work and life	Archiving for consultation	Time-consuming
	Adapting to employees' needs	Loss of casual dissemination of information	Ambiguity
	Difficulty building feeling of belonging to organisation	Knowledge retention through diligent note taking	Difficulty reading emotions
Personal Isolation	Disconnection to workplace	Selective consumption	Difficulty reading body language
	Attendance at socials	Reduction in the sharing of low tier information	Missing social intuition / clues
	Zoom fatigue	Loss of information	Disconnection
	Loss of social initiative	Ability to work with others (Outside of work)	Extensive note-taking
Productivity	Less personal interactions	Team Isolation	Interruptions
	Distractions in the office	Disconnection from colleagues	Missing social interactions
	Preparation for zoom meetings are higher	Note-taking helps to stay on track	Ease of communication
	Lack of transition period	Archiving	Necessity to make an effort
	Zoom fatigue	Difficulty building relationships the more people	Discouragement of conversation
	Increased speed of work / deep work	Team isolation	Loss of contributions
	Better headspace / concentration / focus	Idea Generation	Similarity to in-person meetings
Development of relationships	Hampered development of relationships	Individualism vs Collaboration	Hampered communication of less important points
	Structured Interactions	Lack of spontaneity	
	Social compensation	Weak relationships hampering cooperation	
	Team building needed to build relationships	Brainstorming missing	
	Disconnection	Structured idea generation	
	Communication Difficulties	Idea generation hampered	
	Zoom fatigue	Social interaction as inspiration	
	Trust through developing relationships	Lack of bouncing ideas	
	Necessity of in-person interactions	Innovation isolated to individual	
	Loss of interpersonal play	Small informal interactions missing	
	Lower capacity to pay attention	Less energy and involvement	
	Disinterest	Threshold of communication	
	Formality in interacting	Creativity	
	Loss of spontaneity in social interactions	Creativity depended on individual	
	Lower attendance at socials	Less impetus to be creative	
	Less friendship, more business	Brainstorming hampered	
	Difficulty of belongingness	Feeling of belonging	
		Less collaborative creativity	
		More individual creativity	
		Less informal social interactions	

Coding Table
Note that some codes are the same but appear in different categories. The reason for this is because their placement depends on the context of the quote.