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Unpacking Crisis-Driven Digital Transformation

Through the lens of dynamic capabilities

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Unpacking Crisis-Driven Digital Transformation: Through the lens of dynamic capabilities

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ABSTRACT (MAX. 200 WORDS):
Covid-19 has had profound effects on peoples' health and livelihoods; resultingly, companies have felt the recoil too. Social distancing mandates and supply chain disruptions have forced organizations to adapt. Organizational adaptation has occurred in many forms; however, when organizations orchestrate digital business model change through the use of digital technologies, it can be argued that digital transformation has occurred. With our qualitative study utilising semi-structured interviews, we have taken a look at how Covid-19 has driven digital transformation among incumbent firms. Previous findings point toward results that argue that Covid-19 has sped up rates of digital transformation, and that digital transformation attempts during Covid-19 are prone to failure, but research has not yet taken the angle of exploring the reasons as to how the pandemic has impacted digital transformation. Our research has sharpened the blur regarding the mechanisms that are in play with Covid-19 and digital transformation by looking at the phenomenon through a lens of dynamic capabilities. This has shown the importance that upskilling internal resources, digital maturity, and a focus on people over technology has had in organizations that embarked on digital transformations during Covid-19.

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Definitions

Digital Transformation	"A change in how a firm employs digital technologies, to develop a new digital business model that helps to create and appropriate more value for the firm" (Verhoef et al. 2021, p.889).
Dynamic Capabilities	The firm's ability to adapt, renew and reconfigure their resources in highly competitive environments (Wang & Ahmed, 2007).

1 Introduction

1.1 Background

Covid-19 was declared a pandemic on the 11th of March 2020, the repercussions this novel coronavirus brought about caused a global health crisis affecting, in-essence, every nation on earth. This health crisis pushed many organizations to swiftly adopt technology to keep business buoyant (Power & Hadidi, 2021). It can be said that organizations were forced to adapt according to the old proverb *necessity is the mother of invention*, which refers to humanity's ability to create solutions for problems when the need is critical (CGI, 2019). This proverb has resonated as of recent within the world of business, and resultantly so, also within the world of IT. Furthermore, IT collaboration and conferencing solutions such as Microsoft Teams, Zoom, and Asana have found widespread use during the pandemic (Soto-Acosta, 2020; Brynjolfsson, Horton, Ozimek, Rock, Sharma & TuYe, 2020). But the implications that these IT solutions have had on organizations, among the myriad of other IT solutions that have been introduced, are currently fuzzy and uncertain. With this proverb in mind and in addition to the uncertain implications of crisis Covid-19, this thesis will look at *Digital Transformation* (DT) as the mechanism for companies utilizing digital technologies to reform their business models as a result of Covid-19.

DT has eloquently been described, at a high level, as "the modern-day fight to survive the existential threat of digital disruption" (Li, 2020, p.3). A more granular definition would define DT as "change in how a firm employs digital technologies, to develop a new digital business model that helps to create and appropriate more value for the firm" (Verhoef, Broekhuizen, Bart, Bhattacharya, Dong, Fabian, Haenlein. 2021, p.889). Wessel, Baiyere, Ologeanu-Taddei, Cha & Blegind-Jensen (2021) highlight the fast pace that DT publications have dispersed into the IS field of research, looking at the scholarly attention and business and policy maker investments that have been placed into DT, rendering it "perhaps *the* technology-related phenomenon of our times" (Wessel et al. 2021, p.2). Despite this distinction, Wessel et al. (2021) raise the question regarding DT's conceptual validity that entertains the notion of whether DT actually is a new phenomenon, or if it is merely an "appealing label used to depict change processes that researchers in management and information systems (IS) have already scrutinized for decades." (Wessel et al. 2021, p.2). Soto-Acosta (2020) dismisses the qualms over DT being a reinvention of the wheel by explicitly stating that in-order for DT to have taken place, changes to an organization's business model must have occurred through the introduction of digital technologies. It is not enough to add new technology to a process and call it digital transformation, this would be more akin to something simpler, such as digital change, but at the same time, an entirely new business model is not a requirement either as existing business models can be reformed to include digital technologies (Soto-Acosta, 2020).

The longitudinal consequences of the pandemic are uncertain; however, certain effects can largely be attributed to have been caused by the ongoing crisis such as the increase in global internet traffic by 60% from December 2019 to May 2020, of which, video conferencing internet traffic had increased by 120% (Soto-Acosta, 2020). Pandemic related constraints

increased the prevalence of remote work, with surveys showing one third of the American workforce having made the switch to remote work between February 2020 to May 2020; in combination with those already working from home before the pandemic, this resulted in half of all American workers working remote (Brynjolfsson et al. 2020). Lockdowns of several regions in China, that engulfed entire industrial sectors, caused ripples that spread internationally through supply chains (Meier & Pinto, 2020). Globally interconnected supply chain disruptions halted the production and manufacturing of many products (Pujawan & Bah, 2022), with a notable example being the semiconductor shortage that kept many vehicle production lines at a standstill in the wait for shipments of computer components (Voas, Kshetri & DeFranco, 2021).

It is in situations of crises, like a pandemic, that organizations are put to the test according to the age-old adage of *survival of the fittest*. Those who prospered were likely *innovative* out of *necessity* in the face of pressure. This phenomenon is what this thesis has explored; or in other terms, the impact that the Covid-19 crisis has had, and still has, in driving DT in organizations.

1.2 Problem

Covid-19 poses multiple challenges in how to stay competitive in a volatile and uncertain market (Fletcher & Griffiths, 2020). One remedy that organizations attempt in order to stay afloat, or attain competitive advantage, is to execute DT; however, research providing solutions to how firms can digitally transform have shown themselves to be complicated in practice (Wade & Shan, 2020; Gudergan & Mugge, 2017). This is not because DT is a new phenomenon in the IS domain, in-fact, it is a highly researched topic. For example, when searching for *Digital Transformation* in prestigious IS journals such as AIS (via AISeL), 12 000 results are returned. Alongside this, DT also proves to be a common term found in other IS journals, such as those within the basket of eight. To exemplify, a recent issue of the *European Journal of Information Systems* (EJIS), (Volume 30, Issue 6, 2021) published a research paper tackling DT, as did *The Journal of Strategic Information Systems* (JSIS) in (Volume 29, Issue 3, September 2020). DT is a well-researched topic, yet Datta and Nwankpa (2021) argue that much of the focus of DT research has been placed on the success factors of DT, such as with project ROI, or on meta-analyses of DT implementation failure rates (Wade & Shan, 2020).

According to Datta and Nwankpa (2021) and Wade and Shan (2020), DT is not without its challenges; however, amidst the widespread market disruption that Covid-19 has caused, quite a few cases of adaptation have occurred. With examples in the restaurant industry (Arora, 2020), where some restaurants have adapted their business model to facilitate delivery-oriented *cloud kitchens* over the traditional dining experience (Kulshreshtha & Sharma, 2022). Video conferencing tools also saw success with Zoom making the most perceivable imprint (Arora, 2020) as a result of the increase in remote work (Brynjolfsson et al. 2020). However, these examples merely scratch the surface of the DTs that occurred during Covid-19. This thought-provoking notion creates an interesting avenue for research as to how Covid-19 has impacted organizations to digitally transform, and how ongoing DT efforts have been affected. These are also avenues that have not yet been explored in great depth within IS, as Covid-19 is very recent phenomenon, and a pandemic of a similar scale has not occurred in modern day society. With this gap in the literature, *MIS Quarterly Executive* (MISQE) have launched a call for papers on this topic of *Crisis-Driven* DT for their workshop and special

issue in 2022. The purpose of this workshop and special issue is to illustrate the interplay between DT and crises, as there is currently little research on the topic of crises' roles in driving DT. Similarly, Fletcher and Griffiths (2020) call for more strong empirical research to be conducted within the area of Crisis-Driven DT. It is described that the pandemic has resulted in a dilemma where the importance of *being first* has exceeded the quality and depth of research. Accordingly, there is a need for more systematic and critical studies focusing on organizational processes rather than instant, transformative solutions to existing challenges (Fletcher & Griffith, 2020). Another facet of research that this study tackles refers to the squabble regarding the DT definition, and if the grand encompassing nature of Covid-19 has shifted any conceptual boundaries.

Furthermore, the European Conference on Information Systems (ECIS) 2021 recently made a statement, inviting researchers to conduct studies on how to successfully manage digital transformation processes. Among other areas, the topic of DT includes innovation, organizational science, and management (Verhoef et al. 2021), all of which have a strong correlation with the IS discipline. Applying these perspectives on the concept of Crisis-Driven DT can generate valuable insights in how to transform digital business models, thus contributing to new and relevant knowledge in the IS discipline. We aim to use an interdisciplinary research approach to contribute new knowledge in the field of DT, and thereby subsequently also IS, by amalgamating theory from *strategic management* using models of *Dynamic Capabilities* (DC) as pioneered by (Barney, 1986; Teece, Pisano & Shuen, 1997; Eisenhardt & Martin, 2000). The concept of such dynamic environments has been a topic in the IS discipline for some time. Adapting to customer needs and changes in the environment has provided organizations with various challenges and opportunities. For companies to succeed in dynamic environments, Eisenhardt and Martin (2000) argue that the most crucial aspect is to develop dynamic capabilities. By doing so, companies can combine valuable resources to create a sustainable competitive advantage (Eisenhardt & Martin, 2000; Teece, Pisano & Shuen, 1997).

This paper aims to help bridge the divide over the existing gap in research between theory and practice regarding digital transformation by taking a Crisis-Driven approach and by applying dynamic capability theory. The study will focus on how Covid-19 has driven dynamic capabilities for companies to digitally transform. It also aims to provide the IS discipline with more depth regarding Crisis-Driven DT, since it is a rather unexplored area; but also, more clarity regarding the practical perspective of DT and how it is reflected in its theoretical definition, as a result of Covid-19.

1.3 Research Question

How has Covid-19 driven dynamic capabilities for companies to digitally transform?

- *Has the definition of Digital Transformation come to change as a result of Covid-19?*

1.4 Purpose

The purpose of this thesis pertains to uncovering the mechanisms in play that drove organizations to sense and seize opportunities in order to digitally transform as a result of the dynamic environment that crisis Covid-19 brought about. Furthermore, the research also sheds light on the conceptual nature of DT itself and if it, as a concept, has seen any shift in definition or scope as a result of Covid-19, that will require further research.

1.5 Delimitation

As of the writing of this thesis, the restrictions and regulations enacted to stop the spread of Covid-19 have been lifted in many countries, more specifically Sweden. This does not however imply that we as authors see that the pandemic has ended, as it is still an ongoing contagion incurring severe tolls on human lives and livelihoods. But, to simplify for the sake of the research we are conducting, we have decided to frame the tense of our tone as *post-pandemic*. This implies that the findings we come to regarding any form of consequence of Covid-19 must be taken with the date of this thesis' publishing in mind. We have as researchers and citizens, taken responsibility in conducting our research as to not impose any risk to any respondent that has asked for cooperation in maintaining certain precautions.

We have in the interest of accessibility, which refers to the process of finding suitable respondents to share examples of DT, and logical reasoning, in our assumption that it is most reasonable and interesting to discuss DT in terms of larger rather than smaller organizations, concluded that the sampling for organizations and respondents in this thesis will be exclusive to incumbent firms. This implies that the companies we have come in contact with are of a larger scale, in other words, the companies we have contacted are not SMEs; this means that the findings this thesis contributes with can only pertain and be generalizable to instances of organizational DT on a larger scale. Another important aspect to note is that all respondents we have met reside and work within Europe, however some of these organizations reach outside of Europe as well.

2 Literature Review

The following chapter presents the key concepts of the study as illustrated in extant literature. By taking a Crisis-Driven approach on digital transformation, this chapter delves into the three main aspects of our research, namely DT, Covid-19 and Dynamic Capabilities in order to better understand the relationship and implications they have for organizations orchestrating digital transformation. Finally, the chapter presents the conceptual model which lays the foundation for the general structure and reasoning of the study.

2.1 Digital Transformation

To begin any body of research engaging in DT, first and foremost, the term transformation must be defined and contextualized. IS as a discipline has since decades been interested in the notion of transformation (Wessel et al. 2021), and it has broadly been considered to be a necessity of strategic importance to improve organizational performance (Henderson & Venkatraman, 1999). But DT is not only an organizational concept, it also refers to large-scale societal and industrial changes that are facilitated by the use of digital technologies (Vial, 2019). However, the scope of this research is within the bounds of organizational DT, but make no mistake, organizational DT is but still a large undertaking with implications that can affect all parts of an organization and beyond, as products, processes, sales channels, and supply chains come to be influenced by the introduction of new technology (Matt, Hess & Benlian, 2015).

2.1.1 IS/IT-Enabled organizational transformation (ITOT)

DT is far from a new concept within IS, as it tackles an intersectional field of management and digitalization, two fields of study that particularly adhere to the IS domain and have been of interest when discerning optimal routes of achieving *organizational transformation* (OT) (Wessel et al. 2021). Within the IS field, *IS/IT-enabled organizational transformation* (ITOT) came to be after studies were performed that measured the transformational impact *enterprise resource planning* (ERP) systems had on organizations after implementation (Wessel et al. 2021). ITOT builds upon the concept of OT which can refer to an abundance of terms, such as radical change, strategic change, revolutionary change, strategic renewal, and organizational frame bending (Besson & Rowe, 2012). Generally, OT can be divided into two main types of change, these being convergent and deep structural change, where convergent change refers to changes occurring within a relatively stable structure such as through process effectivizations and deep structure change refers to changes that take place on the root level of an organization and affect the core business model (Besson & Rowe, 2012). ITOT takes these two forms of OT, yet enhances their application with new digital technologies, just as the overarching concept's name would imply, to orchestrate convergent or deep structural change (Besson & Rowe, 2012). This shows the conceptual progression of OT into ITOT which then subsequently wound up birthing the presumptions that DT took its first steps on (Vial, 2019), with the difference between the two transformation processes (ITOT & DT) being that, according to Wessel et al. (2021), DT incurs a shift in organizational identity, facilitated through changes in one’s value proposition. This can be exemplified in the case of an organization that went through a shift of beforehand only selling digital products to afterwards selling digital services alongside these digital products, this transformation made the organization perceive

themselves as more of a digital service provider rather than as a digital product supplier as a result of their digital transformation (Wessel et al. 2021). On the other hand, ITOT strengthens the existing organizational identity and value proposition through the addition of digital technologies (Wessel et al. 2021). Another conceptual difference between ITOT and DT refers to how DT better reflects the impact that surrounding environmental complexities have on organizations, as can be depicted in how Vial (2019) describes the *impetus* and *locus of uncertainty* for organizational DT efforts to not only reside within the bounds of the organization, but to also come from external drivers such as industrial and societal trends that originate outside of organizational bounds.

2.1.2 Defining Digital Transformation

There has been a myriad of DT definitions that have been developed and refined within extant literature; Vial (2019) has conducted a literature review to compile and compare DT definitions in order to unveil erroneous conceptual conflations and circularity from well cited publications. Some of the authors whose definitions were put under the spotlight include (Piccinini, Hanelt, Gregory, & Kolbe, 2015; Li, Su, Zhang, & Mao, 2018; Matt, Hess & Benlian, 2015; Hess, Matt, Benlian, & Wiesböck, 2016). Vial (2019) further went on to synthesize a new definition for DT that circumvents the aforementioned flaws of previous definitions, which reads:

"*a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies"* (Vial, 2019, p.121)

However, this definition gives rise to complications for this study's use case as it isn't strictly implied as a definition for organizational DT; rather, it is multifaceted and takes the broader societal angle of DT in focus as well, which Vial (2019, p.121) confirms in stating that their definition is also "consistent with the related term of *digitalization*", which is a topic that is outside the scope of our organization centric study. In tandem with this criticism, Markus and Rowe (2021) argue against IS authors uncritical use of Vial's (2019) definition of DT in their submissions to the *Journal of the Association for Information Systems* (JAIS) special issue titled *Envisioning Digital Transformation: Advancing Theoretical Diversity*, as the definition can be interpreted as a statement of theory by its own merit as it implies a causal sequence of triggers, outcomes, and mechanisms. Instead, Markus and Rowe (2021) argue that the definition should be conceptually operationalizable to conduct research with; with this, the definition of DT for this study refers to a:

"*change in how a firm employs digital technologies, to develop a new digital business model that helps to create and appropriate more value for the firm*" (Verhoef et al. 2021, p.889).

Another important note regarding this definition is that in the sense of developing a new business model, it is not enough to add new technology to an organization and call it digital transformation, as this doesn't fulfil the underpinning requirement of altering the business model, but at the same time, business model upheaval isn't necessary either, as the existing business model can instead be reformed to include or revolve around new digital technologies (Soto-Acosta, 2020).

2.1.3 Digital Transformation Model

As mentioned, merely introducing digital technologies into an organization will not bring about DT on its own; instead, digital technology needs to be contextualized within the organization to uncover new ways of conducting business and creating value (Vial, 2019). Context in this sense refers to an overarching plan or model to change the way an organization creates or appropriates value (Verhoef et al. 2021; Matt, Hess & Benlian, 2015). Matt, Hess, and Benlian (2015) contribute a four-dimensional framework for organizational DT strategy which comprises the dimensions *use of technology*, *changes in value creation*, *structural changes*, and *financial aspects*.

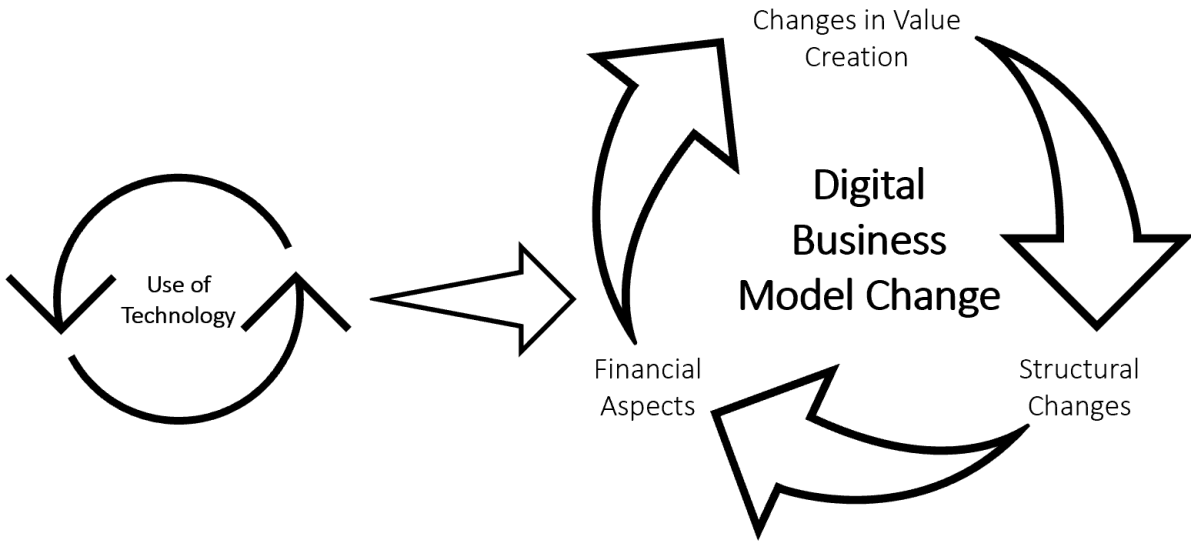

Figure 2.1: Strategic Digital Transformation Model. Created based on Verhoef et al. (2021, p.891) definition of DT with dimensions adapted from Matt, Hess & Benlian (2015, p.341).

Use of technology refers to an organization's attitude and ability to exploit new technology (Matt, Hess, & Benlian, 2015). Nowadays, organizations can be seen investing heavily in technology, both hard and software, within, but not limited to, technologies such as AI, Machine Learning, IoT, and robotics (Verhoef et al. 2021). However, solely investing in technology does not guarantee success as the organization must ascribe a certain level of ambition with their aims in competing among the existing actors in their market's competitive landscape; organizations can set their aims to either establish a market leading role, or a market heeding role (Matt, Hess, & Benlian, 2015; Hess et al. 2016). This conflict of strategic interest ties into a long ongoing debate within the field of *digital innovation* (DI), which has its roots in IS literature (Warner & Wäger, 2019). DI has been described as the experimental combination of digital and physical components to create new products (Yoo, Henfridsson & Lyytinen, 2010). Examples can include RFID chips in running shoes to track exercise data, or medical sensors in clothing to track physiological data (Yoo, Boland, Lyytinen & Majchrzak, 2012). A precursor to DI is *digitization*, which refers to the encoding of analog to digital data, which can be contextualized in the sense of making physical products programmable,

communicable, traceable etc; furthermore, DI also requires an organization to look over its organizing logic and IT infrastructures (Yoo, Henfridsson & Lyytinen, 2010). Yoo, Henfridsson and Lyytinen (2010) frame the key characteristics of DI in (1) the reprogrammability, (2) the homogenization of data, and (3) the self-referential nature of digital technology, entailing that digital technologies that express these virtues enable a layered modular architecture that creates opportunities in the embedding of digital components within physical products, thereby facilitating a strategic choice for organizations attaining DI (Warner & Wäger, 2019; Yoo, Henfridsson & Lyytinen, 2010). The organized logic within this layered modular architecture refers to products that can simultaneously be a product and a platform, with Apple's iPad being a prime example (Warner & Wäger, 2019), which infers the dynamic capability for organizations to operate on several layers, both on level with the device and on level with the platform it facilitates, either in unison or competition (Warner & Wäger, 2019; Henfridsson, Mathiassen & Svahn, 2014; Yoo, Henfridsson & Lyytinen, 2010). Autio, Nambisan, Thomas & Wright (2018) posit that digital innovation which expresses the aforementioned key characteristics enables generativity, in which geographically dispersed audiences can be brought together and harnessed of their potential as a platform. Which, given the iPad as an example, can be understood in the form of the App Store, where users make further purchases of apps after purchasing the device, which in turn generates revenue two-fold for Apple. These new business ventures reinvent the way organizations capture value through changes in business models (Autio et al. 2018). Capturing new means of value will help organizations to become market leaders as it can force other firms to become dependent on one's technological standards; however, it is at the same time riskier and requires certain technological competences (Matt, Hess, & Benlian, 2015).

2.1.4 Digital Business Model Change

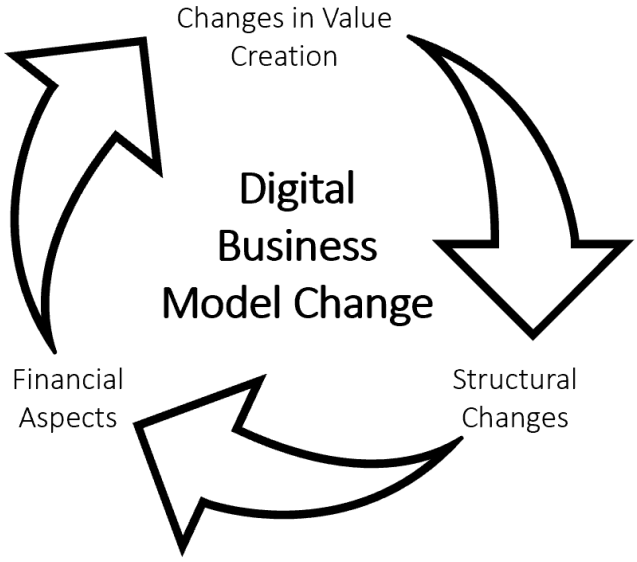

Figure 2.2: Digital Business Model Change. Created based on Verhoef et al. (2021, p.891) definition of DT, with dimensions adapted from Matt, Hess & Benlian (2015, p.341).

Foss and Saebi (2017) report from their systematic review of business model innovation literature that a well-respected and adopted definition for the term *business model* can be described as the "design or architecture of the value creation, delivery and capture mechanisms" of a firm (Teece, 2010, p.172). It can thus be said that digital transformation is strategically linked to changes in business models as a result of digital technology implementation (Verhoef et al. 2021; Ellström, Holtström, Berg, Johansson, 2021). The dimensions *changes in value creation, structural changes,* and *financial aspects* in Figure 2.1, adapted from (Matt, Hess, & Benlian, 2015; Hess et al. 2016), constitute the aspects that an organization is required to regard when orchestrating *digital business model change,* and are linked to the dimension *use of technology* by an arrow.

Changes in value creation refer to how newly implemented digital activities deviate from preceding, and often analog, activities; these changes in value creation can even take the form of expansions of current product and service portfolios (Matt, Hess, & Benlian, 2015; Hess et al. 2016), such as with DI where product offerings can be embellished with services to create a platform (Autio et al. 2018). How an organization captures the interest of their customer base and markets their products and services is known as the value proposition (Vial, 2019). It is important to regard one's value proposition when going about any kind of OT, as it is pivotal to the organization's identity, but in order to reap the benefits of new digital technology, it is required to revamp one's value proposition in order to achieve DT (Wessel, 2021). Moreover, digital technologies can also enable companies to reshape their value networks and digital channels, such as through the use of social media or IoT devices (Verhoef et al. 2021; Vial, 2019). Yet another aspect that can help organizations in changing their means of value creation is organizational agility and ambidexterity, which refers to how firms use digital technologies to sense and seize opportunities for innovation by efficiently and hastily assembling the required assets, knowledge, and business relationships; Analytics and IoT are technologies that can be exploited to extract insights and seize untapped market opportunities (Vial, 2019).

However, digitizing products and services to achieve changes in value creation may require *changes in the structure and organization* of personnel and competencies (Verhoef et al. 2021; Matt, Hess, & Benlian, 2015; Hess et al. 2016; Vial, 2019). If the extent of the proposed changes is fairly limited, then the DT efforts might be able to be integrated into current corporate structures without substantial change (Matt, Hess, & Benlian, 2015). In circumstances where the scope of DT spans several corporate structures, it may become evident that cross-functional collaboration will be required to bridge the divide in organizational and IS strategic interest (Vial, 2019). One approach is to create a separate unit that operates under certain assigned independence from the organization to foster innovation (Maedche, 2016; Verhoef et al. 2021). Another way is to create cross-functional teams that reside within current corporate structures (Dremel, Herterich, Wulf, Waizman, & Brenner, 2017). It has been found in a longitudinal case study at Audi AG that multidisciplinary competence networks that transcended the organizational structures helped the organization become more analytic-driven, as a result of DT (Dremel et al. 2017; Vial, 2019). On top of the reorganization of competencies and teams, there is a need to regard the impact that organizational culture and leadership will have upon DT efforts; a common theme can be found across studies that points to the potential benefit that firms can find in having an experimental and risk-taking mentality with digital technologies (Vial, 2019).

The preceding dimensions of digital business model change are all governed by one congruent factor, the *financial aspect* (Matt, Hess, & Benlian, 2015; Hess et al. 2016). The financial

implications of DT are, as previously mentioned, complex, with literature pointing toward dire sunken costs and implementation rates (Datta & Nwankpa, 2021; Wade & Shan, 2020). But, just as the bottom-line plays a constricting role in DT, so does it play an incentivising role, as changes in value creation can coincidentally also create more value. However, organizations can not be lethargic, as, while lower financial pressure on organizations may disincentivize DT, organizations already pressured may find difficulties in sourcing means of financial investment to digitally transform when it is truly needed; in essence, DT needs to be a proactive, not reactive action (Matt, Hess, & Benlian, 2015; Hess et al. 2016).

2.1.5 Digital Transformation Hurdles

These dimensions combined create a holistic strategy that encompasses the constituent aspects of digital business models with the use of digital technologies to perform DT (Ellström et al. 2021). It is important to seek to obtain a close fit between the strategies already in play, such as IT, organizational, and functional strategies, and the to-be implemented DT strategy (Matt, Hess, & Benlian, 2015), as a systematic approach to formulating a DT strategy is crucial for success (Hess et al. 2016). There are a multitude of factors that can come to render an instance of DT to be a less than fruitful endeavour, some of these being *no sense of urgency, not enough funding, limitations of IT systems, unclear roles and responsibilities* among others (Fitzgerald, Kruschwitz, Bonnet, & Welch, 2014). These factors can be summed into two overarching themes, *inertia* and *resistance* (Vial, 2019); with inertia referring to factors where resources and capabilities act as barriers, such as deeply embedded and rigid organizational relationships, and resistance referring to factors where employee reluctance, at any level of the hierarchy, serves to anchor rather than propel change (Vial, 2019; Fitzgerald et al. 2014; Warner & Wäger, 2019). Another facet of uncertainty that has not yet found its foothold within the IS literature regards the impact of large-scale societal shocks.

With the oftentimes substantial changes that DT efforts bring about, it is not too surprising that the path to fruition is not always rock steady. Especially the first few steps toward a new digital business model, which are often unfamiliar (Hess et al. 2016). It is with organizational agility that organizations should approach DT, (Hess et al. 2016) especially during times of heightened exogenous pressure, such as during large economic shocks like Covid-19 (Guerrieri, Lorenzoni, Straub, & Werning, 2020). This is an area of research that the discipline of IS has not yet tackled in any significant depth, leaving the implications of Covid-19 on organizational DT yet to be fully understood.

2.2 Crisis Covid-19

2.2.1 Covid-19s Global Impact

The ramifications of Covid-19 hit the world with global force as governments worldwide imposed restrictions and non-pharmaceutical interventions to halt the spread of the coronavirus (Deb, Furceri, Ostry, & Tawk, 2022). Enacted interventions ranged between diagnostic testing, contact tracing, isolation, and quarantine for infected individuals, in a bid to socially distance populations and reduce the risk of overwhelming healthcare systems (Deb et al. 2022). Governments around the globe sought different responses to managing the virus (Janssen &

Voort, 2020), enforcing many unique and ever-changing regulations on the way economies could function, with examples such as mandated shutdowns of nonessential businesses, stay-at-home orders, and school closings (Maloney & Taskin, 2020). However, since Covid-19 affected countries differently and governments reacted in different ways around the globe, it was inevitable that *supply chains* (SC) would come to be disrupted as a result (Pujawan & Bah, 2022). SC scholars and epidemiologists have pointed toward the fragility that global SC systems exhibit, especially when exposed to such threats as a pandemic (Handfield, Graham & Burns, 2020). This SC weakness has its roots in the relentless pursuit of *lowest landed cost* in the manufacturing supply network, which has resulted in the overdependence on exports from China and countries in Southeast Asia (Handfield, Graham & Burns, 2020; Meier & Pinto, 2020). So, when these countries faced economic lockdowns that halted production processes and subsequent SC, the interlaced global economy felt the ripples.

2.2.2 Covid-19s Organizational Impact

The root cause for SC disruptions had to do with, as stated earlier, risk mitigation measures that governments enforced in order to slow the spread of the virus (Deb et al. 2022; Janssen & Voort, 2020). Social distancing was one of the key measures that governments used, and it was effective at that; across different countries, rate of infection graphs was flattened as a result of social distancing mandates (Flaxman et al. 2020). Social distancing affected organizations in a myriad of ways; resultantly, numerous techniques were used to keep operations buoyant, one of these techniques being remote work (Soto-Acosta, 2020; Brynjolfsson et al. 2020). Pre Covid-19, remote work was already an established business practice, but it had yet to permeate the common culture, which it managed to do during Covid-19 (Brynjolfsson et al. 2020), as it forced virtual IT infrastructure to proliferate in order to enable meetings and general business workflow to function as before (Soto-Acosta, 2020; Gabryelczyk, 2020; Wade & Shan, 2020).

However, not all businesses were affected equally by Covid-19, in general, businesses that already had revenue streams firmly planted within digital channels such as online retailers in the form of clothing, consumer electronics etc, are less likely to be in the need of redefining themselves in any large capacity (Almeida, Santos & Monteiro, 2020). But businesses of a smaller size with less financial leeway and those whose business models were in the direct line of fire of non-pharmaceutical interventions, such as those within the tourism and restaurant industry suffered a great deal more (Almeida, Santos & Monteiro, 2020). But even within heavily afflicted industries, such as the restaurant industry, there has been potential for technology to enable enhancements or even rejuvenations of business models; where revamped procedures switched the focus from in-house dining to delivery through food-delivery services and even a step further with cloud-kitchens, in which a single kitchen houses several online restaurant façades for customers to order from (Kulshreshtha & Sharma, 2022). But in the case of fine dining, much of the experience lies in visiting the establishment and enjoying exemplary service, this type of business can be regarded to have been less favoured in light of any possible technological embellishment to adapt to Covid-19.

A commonly posed question within Covid-19 driven DT grasps at the notion of "if (and in that case, how) Covid-19 has sped up the rates of digital transformation?". The general consensus is yes (Amankwah-Amoah, Khan, Wood, & Knight, 2021; Almeida, Santos & Monteiro, 2020; Soto-Acosta, 2020; Wade & Shan, 2020), but the dimension of *how* and all further implications of the question are not as clear. Wade & Shan (2020) argue that Covid-19

may have made DT harder going forward as organizations think they can achieve crisis induced levels of DT, both in terms of pace and scope, without the push or *coal under one's feet* that a crisis can account for. Soto-Acosta (2020) questions whether the urge to go back to business as usual will overpower the will to continue digitally transforming, depending on how organizations define the role of technology in their work. Gabryelczyk (2020) ponders the concept of digital transformation, and whether the widespread switch to remote work with its implied changes in technology use and business models actually encompasses digital transformation, or if it is better defined under another term. These are all valid considerations of aspects that are of significant interest; however, they are also complex questions and may require studies of a more longitudinal scope. Nevertheless, by applying a dynamic capability approach, the fuzzy and hard to define environmental factors of Covid-19s impact on organizations DT efforts are put in the forefront, which may lead to novel perspectives and knowledge contributions.

2.3 Dynamic Capabilities

2.3.1 Organizational Resilience

In light of the recent pandemic, organizations were forced to quickly adjust to new demands in order to stay competitive in a volatile market. While some organizations remained unbothered, others had to make significant changes to survive. According to Duchek (2020), a crucial aspect in this context is for organizations to develop a so-called resilience capacity, which enables them to react rapidly to unexpected events. However, rather than taking immediate decisions, companies are advised to focus on their internal capabilities to capitalize on these events that potentially could threaten their survival (Duchek, 2020). Similarly, Vogus and Sutcliffe (2007) argue that organizational resilience is becoming increasingly important for organizations to maintain. Accordingly, there is a need to develop a theory on organizational resilience to challenge and complement existing models (Vogus & Sutcliffe, 2007).

The term organizational resilience has been known for several decades, but it is only recently that researchers have started to stress its actual importance. With various definitions being developed through the years, a common notation has started to emerge, and while no definitive definition has been set, the report will proceed with the following interpretation of organizational resilience:

> *"a firm's ability to effectively absorb, develop situation-specific responses to, and ultimately engage in transformative activities to capitalize on disruptive surprises that potentially threaten organization survival"* (Lengnick-Hall, Beck & Lengnick-Hall, 2011, p.244).

Using this definition as a reference point, there are some perspectives worth distinguishing with regards to resilience. The first part of the definition stresses the importance of adaptability in rapidly changing environments. That implies that for companies to stay competitive they must develop capabilities where interchangeability is at the core. Hence, if a system is easily interchangeable or agile, companies have a higher chance of succeeding (Lengnick-Hall, Beck & Lengnick-Hall, 2011). Additionally, firms must work effectively to absorb disruptive surprises, meaning that they are encouraged to use coping strategies to quickly perform at the same level as expected before the disruption (Lengnick-Hall, Beck & Lengnick-

Hall, 2011). The second part refers to a firm's ability to engage in transformative activities as a response to external events. This layer looks beyond just the maintenance and restoration of organizational functionality, and instead focuses on how these types of events could advance the firm's position as opposed to before (Duchek, 2020). In this sense, companies are opening up opportunities to reinvent business models and strategies for the better as a result of disruptive events, which is something that Duchek (2020) describes as an offensive rather than defensive response. According to this perspective, organizational resilience can thus be viewed as active choices firms' make in times of great uncertainty to capitalize from these events. Some researchers have taken one step further into the concept of organizational resilience, incorporating the notion of anticipation as a complement to the other actions described above. One of those researchers is Somers (2009) who suggests that organizational structures and processes are developed through organizational resilience. Moreover, Somers (2009) advocates that for organizations to thrive during a crisis, they must focus on developing internal processes and organizational structures that facilitate latent resilience. Subsequently, a firm's ability to use internal capabilities to respond to future events will be a crucial step to thrive in the face of adversity (Sommers, 2009). To support this, Duchek (2020) states that resilient organizations need internal and external capabilities that enable them to adapt to changing conditions; something which has been earlier described by Teece, Pisano and Shuen (1997), as dynamic capabilities. While organizational resilience is focused on recovering and transforming businesses in times of crises, other concepts like DC are more concentrated on a firms' internal and external skills, resources, and competences to adapt in rapidly changing environments (Teece, Pisano & Shuen, 1997). Hence, while not complete opposites, the different concepts can still shed light on very distinctive perspectives in an organization.

2.3.2 Resource Based View

The resource-based view (RBV) of the firm is a well-established managerial framework for understanding how competitive advantage can be achieved and sustained over time (Eisenhardt & Martin, 2000). The concept itself relies on the fact that resources are in focus instead of products. If the resources then are considered valuable, rare, and non-substitutable, Wernerfelt (1984) argues that firms can achieve sustainable competitive advantage. While the RBV of the firm provides further context to internal capabilities in correlation with performance, the perspective has been widely criticized for numerous reasons. Eisenhardt and Martin (2000) pointed out its lack of empirical grounding as well as conceptual vagueness by stating that the terminology is inadequate in terms of clarity. Additionally, the concept has been described as static, hence contributing to the notion of the model not being able to help organizations in achieving sustained competitive advantage (Eisenhardt & Martin, 2000). Another well-established critique against the framework is the generalizability of the RBV, implying that the applicability of the model is very limited. According to Kraaijenbrink, Spender & Groen (2010), that is because in unpredictable environments, in which new technologies and markets emerge and the value of resources rapidly change, the theory is not applicable to explain a firm's process in creating sustainable competitive advantage. Although most firms in today's environment are considered dynamic, Kraaijenbrink, Spender and Groen (2010) argue nonetheless that the key aspect in utilizing the RBV of the firm is to incorporate DC into the framework. Accordingly, rather than being considered outdated and irrelevant for achieving sustainable competitive advantage, the RBV of the firm can be enhanced into a more viable theory if it were to be complemented by more dynamic aspects such as DC. This would not only refute Eisenhardt and Martins (2000) criticism regarding it being too static, but also increase the generalizability of the framework to be applicable in more areas of research.

Conclusively, the RBV acts as an empirical ground on which the context and implications of DC can be understood and given. Appropriately, the following section aims to describe the theory of DC to stress its relevance in today's environment.

2.3.3 Dynamic Capabilities Theory

The notion of dynamic capabilities is a result of firms' attempts to adapt, renew, and reconfigure their resources in highly competitive environments (Wang & Ahmed, 2007). Although the term was firstly introduced by Teece, Pisano and Shuen in 1997, the concept of DC has been extant for several decades. A well-established notion in IS literature is that the theory developed as an expansion of the RBV of the firm (Eisenhardt & Martin, 2000; Teece, Pisano & Shuen, 1997; Wang & Ahmed, 2007; Kraaijenbrink, Spender & Groen, 2010; Matarazzo, Penco, Profumo & Quaglia 2021), and although a widely accepted definition of the theory is currently lacking, researchers have agreed upon its main purpose being to obtain and eventually sustain competitive advantage. In addition to this, when searching for "dynamic capabilities" in the *Journal of the Association for Information Systems* (JAIS), over three hundred results are displayed, further implying that the concept is established within IS research. There are however some limitations with regards to the main concepts of the theory, leaving it up to researchers to make different interpretations. An example of such an interpretation is one made by Wang & Ahmed (2007) who divide the theory into three different capabilities: *the adaptive*, *absorptive*, and *innovative* capability. The adaptive capability refers to a firm's ability to identify emerging market opportunities while the absorptive capability is, according to Cohen and Levinthal (1990), the ability to recognize the value of new, external data and then apply it to make profit. Lastly, the innovative capability is defined by Wang and Ahmed (2007) as a firm's ability to develop new products through the implementation of new, innovative business processes and behaviours. Not unlike the interpretation of Wang and Ahmed (2007), Schoemaker, Heaton and Teece, (2018) characterize three specific dimensions of DC including sensing change, seizing opportunities, and transforming the firm. By taking this angle, Schoemaker, Heaton and Teece (2018) argue strongly for using these three dimensions to outperform rivals, hence claiming that the main purpose of DC is to create a competitive advantage. In another recent study from Steininger, Mikalef, Pateli and Ortiz-de-Guinea (2022) the concept of DC in IS research is critically reviewed and conceptualized. It is described that the current view of DC in IS literature is worrisome as it lacks a clear definition. The three capacities embedded in the framework are furthermore, according to Steininger et al. (2022), considered too wide, where they lay forward an example of sensing, that in today's research is not only about identifying opportunities and threats but also monitoring the environment and recognizing value from external sources. Accordingly, the authors express a need for more clarity regarding the three concepts sensing, seizing, and transforming in IS literature which can be done by identifying specific aspects of the capabilities, for instance, sensing if a change is from within the organization or a consequence of external events. As evident from the study, we will investigate the latter since Covid-19 is an example of an external disruption.

To summarize, these interpretations shed light on different perspectives on the theory of DC but can also be viewed as somewhat similar when compared to one another. Accordingly, while Wang and Ahmed's (2007) interpretation is more focused on a firm's performance and the latter on sustaining competitive advantage, the capabilities described in these articles can be equated to each other, with the adaptive capability being equal to sensing, absorptive being equivalent to seizing, and innovative being interchangeable with transforming the business. In

the following study, we will adopt Steininger et al. (2022) and Schoemaker, Heaton and Teece's (2018) definition of dynamic capabilities, applying the concepts of sensing, seizing, and transforming to help better understand the impact Covid-19 has had on enabling DC for DT. However, since the study will aim to incorporate DC into Digital Transformation, there is a need to apply the digital perspective on the DC theory, ultimately leading to the notion of applying *digital* sensing, seizing, and transforming. In the following chapter these dimensions will be further described to get a better understanding of how dynamic capabilities can drive companies to digitally transform.

2.4 Dynamic Capabilities for Digital Transformation

While numerous researchers have addressed both digital transformation and dynamic capabilities over the past decades, few have succeeded in describing the interrelatedness between the two. A reason for this according to Warner and Wäger (2019) is that most studies carried out within the same topic have focused on structural changes, strategic management, and organizational change rather than the impact DC can have on digital transformation. Furthermore, it is described that even though there is extant literature on building dynamic capabilities for strategic change, few researchers have asked *how* organizations can utilize DC for DT (Warner & Wäger, 2019). Similarly, Ellström et al. (2021) argue that, as the speed of new digital tools are progressing, so is the need for structural changes in a firm to create competitive advantage. This is in turn a result of digital technologies enabling firms to create, design and manage capabilities to adapt to rapidly changing markets (Ellström et al. 2021). Moreover, Ellstrom et al. (2021) place particular emphasis on the need of dynamic capabilities to facilitate changes to a company's business model and internal processes. This does not however imply that a firm's focus should be on constantly adjusting to stay competitive, but rather that a key aspect of successful DT is having dynamic business models, strategies and processes that are easily adapted in a changing environment (Ellström et al. 2021). In that way companies can use digital technologies to work proactively rather than reactively.

Given this context, Teece (2018) argues that new technologies infer opportunities to new business models to which corporate strategy must react to, which in turn provides companies with capabilities to digitally transform. Thus, applying digital technology on sensing, seizing, and transforming can be viewed as an enabler for successful implementations of new strategies and business models.

2.4.1 Digital Sensing

Based on Steininger et al. (2022) earlier assumption that sensing is about scanning the environment to identify opportunities and threats, Warner and Wäger (2019) express that a crucial aspect in this matter is the use of technology to trigger the building of DC for DT. This can for example be done through identifying new technological trends which in turn is distributed through informal and formal networks (Warner & Wäger, 2019). In this way, digital technology contributes to new knowledge being presented and distributed both within and outside the company. Warner and Wäger (2019, p.335) continue with dividing the term digital sensing into three main categories including *digital scouting*, *digital scenario planning* and *digital mindset crafting*. In essence, these three categories refer to a firm's ability to scan technological trends, formulate digital strategies and promote digital mindsets. In addition to this, with

the rise of phenomenon like Big Data, IoT, and AI, companies are discovering new ways to scan the environment and collect data, thus contributing to the notion of more digital sensing being conducted (Ellström et al. 2021). Developing the concept one step further allows for yet another layer to be added in terms of predicting the environment rather than just reacting to it, something which has been described by Warner and Wäger (2019) as crucial, especially in today's dynamic environments. Accordingly, if the aforementioned digital tools are used correctly, companies can work more proactively to gain advantages over their competitors (Ellström et al. 2021). Given this context, Warner and Wäger (2019) conclude that one of the most important aspects to make digital sensing possible in incumbent firms is to change the organization from within. This can for example be done through changing the organizational culture or crafting a digital mindset amongst the employees to enhance sensing capabilities which essentially will allow the firm to seize newly discovered opportunities (Warner & Wäger, 2019). Hence, in the following section, the concept of digital seizing is described to help understand how firms' can use dynamic capabilities to transform their businesses and capitalize on disruptive technologies.

2.4.2 Digital Seizing

A common theme often found in the literature of dynamic capabilities is the notion of business model innovation being a central aspect of seizing opportunities (Warner & Wäger, 2019; Schoemaker, Heaton & Teece, 2018; Ellström et al. 2021). In order for business model innovation to succeed, Warner and Wäger (2019) argue that strategic agility must be incorporated into the model to rapidly respond to external opportunities. This is in turn enabled through agile and flexible working environments where reconfiguring processes and understanding the impacts of possible changes are the two most important capabilities of seizing opportunities (Warner & Wäger, 2019). Further incorporating strategic agility into the firm allows for more prototyping which in turn can be a great way of visualizing and understanding newly discovered data, thus contributing to the notion of seizing opportunities as a result of sensing the environment. Looking at the capability from another perspective, Ellström et al. (2021) argue that firms need to develop strategies to understand, capture and evaluate potential opportunities through the use of new technologies. To display this, Ellström et al. (2021) make a reference to the case of Kodak as a perfect example of an organization who failed to seize the opportunity in a dynamic environment. Even though the top management knew of the digital camera, they failed to recognize its actual value, leaving them in the shadow of their competitors. Hence, while they succeeded in sensing market trends in the environment, Kodak failed to utilize digital technology to seize opportunities from external events, eventually leading to them filing for bankruptcy in 2012 (Schoemaker, Heaton & Teece, 2018). Another interpretation of seizing in correlation with DT is from Yeow, Soh & Hansen's (2018) article where they state that seizing is more than just understanding new business opportunities. Rather, they argue that deciding upon what specific changes to make across multiple components to capture those sensed opportunities is a more accurate approach to the concept (Yeow, Soh & Hansen, 2018). Again, by applying a digital perspective on those changes creates a foundation on which digital technologies can contribute to more opportunities being presented to the firm, which eventually can enable a successful digital transformation.

2.4.3 Digital Transforming

Given Steininger et al. (2022) assumption that transformation is about the capacity to change based on the sensed and seized opportunities, it could be argued that the theory of dynamic capabilities is based on a sequential process. That is because in order for the transformation process to take place, the organization must go through the other two steps of sensing and seizing first. The process then starts with a company scanning for market trends, identifying external events, and measuring their possible impact (sensing), to make decisions on how to capitalize from those events and opportunities (seizing). The final step of transforming is then where the actual change is happening based on the two previous capabilities. With regards to DT, Warner and Wäger (2019) suggest that digital maturity is the most eminent factor to enable digital transformation in an incumbent firm, digital maturity is a broad term that is tough to accurately define, but in an overarching sense, it refers to:

> *"Adapting to increasingly digital market environments and taking advantage of digital technologies to improve operations"* (Kane, Palmer & Phillips, 2017, p.3)

It also includes changing the organizational culture as well as redesigning internal structures so that it is more receptive to change (Warner & Wäger, 2019). From the digital perspective this would also imply changes to a company's digital business model, where adjusting value creation and the use of technologies can be seen as an essential part of making processes more dynamic. Furthermore, Warner and Wäger (2019) argue that factors like leadership and decentralization have a direct impact on digital transformation attempts within companies. Without a management that is open for changes to business models and internal structures, DT attempts are likely to fail. The same applies for centralized organizations, where Warner and Wäger (2019) argue that organizational transformation today is not led by hierarchy, but by purpose; in other words, DT is not driven only by top level management, but rather by entire organizations making changes such as enhancing the digital maturity across all divisions simultaneously.

2.5 Conceptual Model

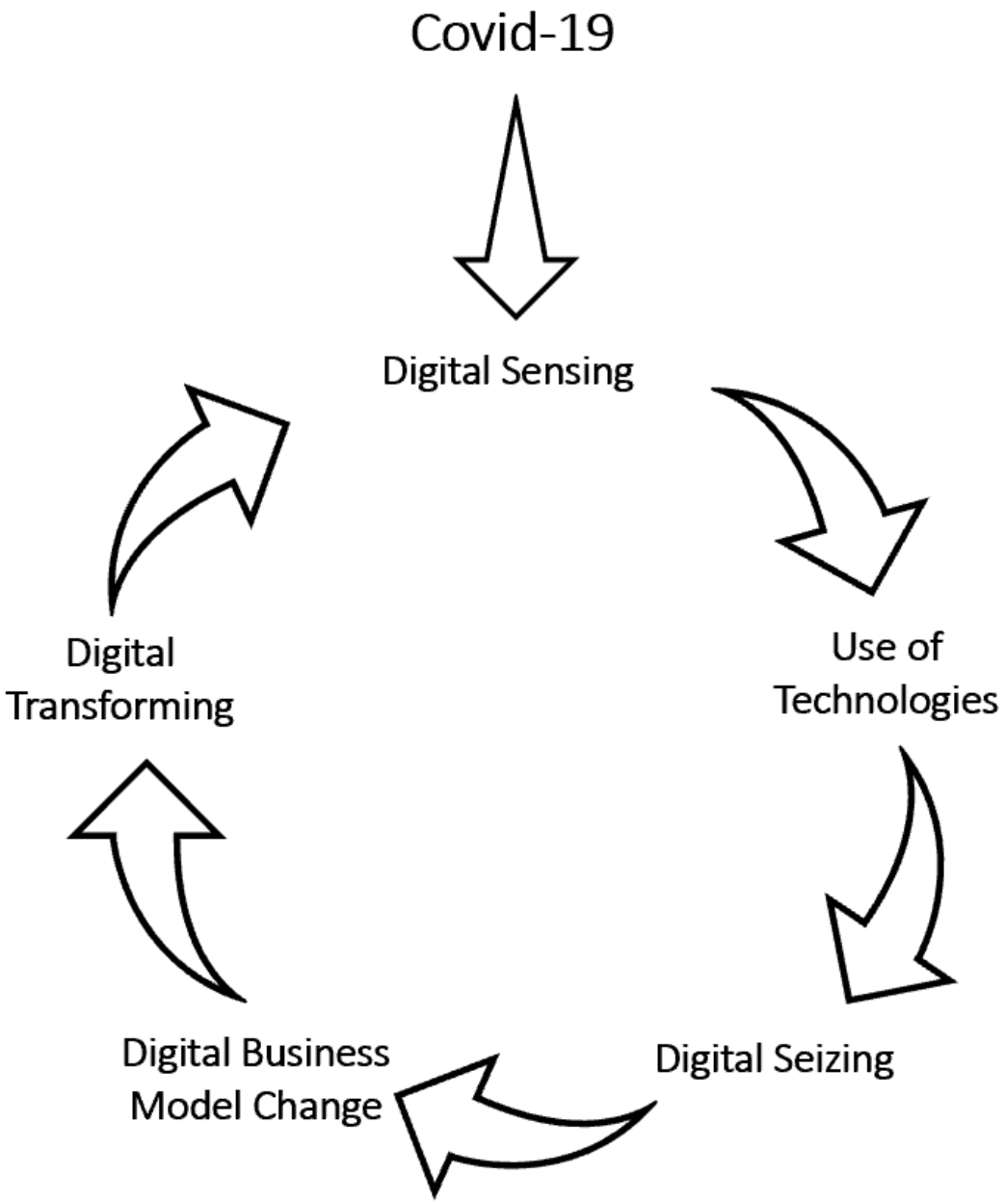

Figure 2.3: Conceptual Model based on the key concepts of the study

The model above acts as a foundation on which the reasoning and analysis of the study will rely upon. All of the key concepts are included and incorporated to demonstrate the relationship and impact they could contribute to in today's dynamic environments. With Covid-19 acting as a starting point of the model, we want to describe the enabling effect it could have on the following sequential process. Covid-19 is in this study viewed as an external event facilitating digital sensing which in turn creates a need for the use of digital technologies. The reason we view Covid-19 as an enabler is in light of the literature review that consistently

displayed the phenomenon as a driving force in terms of facilitating DT (Amankwah-Amoah, Khan, Wood, & Knight, 2021; Almeida, Santos & Monteiro, 2020; Soto-Acosta, 2020; Wade & Shan, 2020). Nonetheless, using these aforementioned technologies, such as AI or Big Data also allows for opportunities to be presented to companies. In some cases, these technologies can even be used to predict the environment or work proactively, as described by (Matt, Hess, & Benlian, 2015), to sense possible threats or opportunities in the environment. Further on, with the use of digital technologies, firms may seize these opportunities to either capitalize from the events or make changes for the better. An example of such change could be to a company's digital business model where changes in value creation, financial aspects, and structural changes are included. These changes are important to understand since they together enable the digital business model to change. Eventually, when adjustments to the business model have been made, the process ends in a digital transformation attempt which is also the final step in our model. Also, given the highly dynamic environment, we made the choice to reiterate the process, so that when one digital transformation process has ended, another one is started through digital sensing. Conclusively, we view DT as a continuous process of renewal upon which companies must take action to stay competitive in the environment.

Given the research question "*How has Covid-19 driven dynamic capabilities for companies to digitally transform?",* some clarifications need to be made to explain its relevance in this study. As evident from the RQ, the study aims to explore three main concepts and their interrelatedness: Covid-19, dynamic capabilities, and digital transformation, all of which have been studied in different contexts within IS literature and are therefore relevant from an IS perspective. Additionally, as stated above, Covid-19 is in this study viewed as an external disruptive event, and we aim to explore its possible implications on facilitating dynamic capabilities for digital transformation. In order to understand *how* companies may benefit from developing DC for DT, it is thus relevant to consider Covid-19 as a driving force since it allows for another layer to be added to a research area that is highly relevant in today's dynamic environments. Given this context, we believe that in order for companies to stay competitive they must go through continuous improvement which can be done through DT. For DT to be facilitated, companies should develop DC, which in turn can be facilitated through an external event such as Covid-19. In this way, the three main concepts are connected, in essence, providing the study with a unique lens that we believe will become important to account for in the future.

2.6 Thematic Overview

As mentioned earlier in the chapter, the three main concepts of this study are well reviewed in extant literature. While the majority of these earlier studies tend to focus on particular aspects of the three phenomenons, some common themes can be identified and analysed. Although some themes are more eminent than others, they all play a significant role in providing context to the given concepts. Accordingly, Table 2.1 displays the concepts and their dimensions followed by an overview of references relevant to each dimension.

Table 2.1: Thematic Overview

Concept	Dimension	Articles
Digital Transformation	• IS/IT Enabled Transformation	Wessel et al. (2021); Besson & Rowe (2012); Vial (2019).
	• Digital Transformation Theory and Model o Use of Technology o Changes in Value Creation o Structural Changes o Financial Aspects	Verhoef et al. (2021); Vial (2019); Matt, Hess & Benlian (2015); Hess et al. (2016); Piccinini et al. (2015); Li et al. (2018); Markus & Rowe (2021); Soto-Acosta (2020); Warner & Wäger (2019); Yoo, Henfridsson & Lyytinen (2010); Yoo et al. (2012); Autio et al. (2018) Foss & Saebi (2017); Teece (2010); Ellström et al. (2021); Maedche (2016); Dremel et al. (2017).
	• Digital Transformation Hurdles	Vial (2019); Matt, Hess & Benlian (2015); (Hess et al. 2016); Fitzgerald et al. 2014; Warner & Wäger, 2019; Guerrieri et al. (2020).
Crisis Covid-19	• Covid-19's Global Impact	Deb et al. (2022); Janssen & Voort (2020); Maloney & Taskin, (2020); Pujawan & Bah (2022); Handfield, Graham & Burns (2020); Meier & Pinto (2020); Flaxman et al. (2020).
	• Covid-19's Organizational Impact	Soto-Acosta (2020); Brynjolfsson et al. (2020); Gabryelczyk (2020); Wade & Shan (2020); Almeida (2020); Kulshreshtha & Sharma (2022); Amankwah-Amoah et al. (2021).
Dynamic Capabilities	• Organizational Resilience	Duchek (2020); Vogus & Sutcliffe (2007); Lengnick-Hall, Beck & Lengnick-Hall (2011); Somers (2009); Teece, Pisano & Shuen (1997).
	• Resource Based View	Eisenhardt & Martin (2000); Wernerfelt (1984); Kraaijenbrink, Spender & Groen (2010).
	• Dynamic Capabilities Theory	Wang & Ahmed (2007); Eisenhardt & Martin (2000); Teece, Pisano & Shuen (1997); Kraaijenbrink, Spender & Groen, (2010); Matarazzo, Penco, Profumo & Quaglia (2021); Cohen and Levinthal (1990); Schoemaker, Heaton & Teece, (2018); Steininger et al. (2022).
	• Dynamic Capabilities for Digital Transformation o Digital Sensing o Digital Seizing o Digital Transforming	Warner & Wäger (2019); Ellström et al. (2021); Teece (2018); Steininger et al. (2022); Schoemaker, Heaton & Teece (2018); Yeow, Soh & Hansen (2018).

3 Research Method

This chapter aims to provide our reasoning behind the methodological choices for our study with regards to the research question. It argues for the chosen qualitative approach in which data collection, data analysis, research quality is described and analysed. Moreover, the chapter accounts for the chosen respondents for this study, a description of the coding process, and the final interview guide formulated to generate insightful data on the chosen topic. Finally, the ethical considerations are displayed to enhance the validity of the study.

3.1 Research Strategy

An often-overlooked aspect of research is the researchers' motivations for choosing a certain research approach in their work. This motivation can be put in other terms, namely the researcher's *research philosophy*. In this case, when scratching the surface of a fairly novel and interdisciplinary domain of IS, namely Crisis-Driven DT, we thought it seemed wise to discern the most suitable process of conducting research based on the balance between our strengths as researchers, what the field is lacking, and what suits the chosen problem best. According to Hassan, Mingers, and Stahl (2018), choosing one's research approach based on what is most common within one's domain is at best not a productive way to begin research. To further this, theoretical dispute within the IS field dubbed *the paradigm wars* have placed an overemphasis on having epistemology tied to one's method, instead the focus is to be placed on the object of the study and what best suits it (Hassan, Mingers & Stahl, 2018). Why our strengths as researchers weigh in as a factor in our choice of philosophical perspective is due to the research's limitations in resources, mainly time and experience. This does however infer that our choice of philosophy is not rid of biases, but at the very least this fact is known and explicit in our argument, entailing that they are not hidden. With this notion in mind, and when reflecting upon our chosen area of research; we made a choice between the three general categories of philosophical perspectives in IS that are positivist, interpretive, and critical (Orlikowski & Baroudi, 1991).

Crisis-Driven DT has to do with managerial decision making in times of great uncertainty; therefore, predefining dependent and independent variables becomes a challenge, making positivism a tougher choice (Kaplan and Maxwell, 2005). Critical research entails a critique of the status-quo, it seeks to unearth "deep-seated, structural contradictions within social systems" (Orlikowski & Baroudi, 1991, p.6; Myers & Klein, 2011). But, peering through a critical perspective requires prior research to have laid the foundation to critique, which can't be said to be the case regarding Crisis-Driven DT (Myers & Klein, 2011); however, this did instead make interpretivism all the more interesting as it emphasizes the subjective, symbolic and socio-political meaning in the human process of constructing and reconstructing one's view of reality (Orlikowski & Baroudi, 1991; Recker, 2013). This makes interpretivism fitting when analysing a new phenomenon, or at the very least a phenomenon with, until now, little research (Recker, 2013; Orlikowski & Baroudi, 1991; Myers & Klein, 2011) such as Crisis-Driven DT. Interpretivism led our way of research by immersing ourselves into companies experiencing the effects of Crisis-Driven DT through field research (Orlikowski & Baroudi, 1991). This approach follows the ontological belief of social constructionism, where the research is conducted amidst the object of research without predefined constructs, instead these

constructs are defined from in-depth examination and exposure to the phenomenon of interest, ensuring that the categories that emerge closely resemble those used by the object of study (Orlikowski & Baroudi, 1991). With this said and with our interpretivist approach, our research is conducted through the use of semi-structured interviews.

3.2 Data Collection

3.2.1 Literature Selection

The purpose of the literature review is to acquire knowledge to be able to contribute to knowledge (Recker, 2013). When selecting literature amongst a variety of sources and journals, a key task was therefore to categorize our knowledge on the chosen topic before starting our research, something which Recker (2013) has described as three types of knowledge. These are: (1) knowledge about the topic of interest (2) knowledge about relevant theories that help you frame your research question, and (3) knowledge about relevant research methods that you can apply to develop new knowledge (Recker, 2013, p.39). Applying these three steps before starting our research allowed us to gain a wider understanding of the topic as well as developing a first structure based on those insights. Similar to Recker (2013), Bhattacherjee (2012) suggests that the purpose of the literature review is three-fold; however, while Recker's three steps are useful to apply before the start the research, Bhattacherjee's (2012) interpretation is more relevant when the process of writing the literature review is ongoing. Thus, the three aspects displayed by Bhattacherjee (2012, p.21) are: (1) to survey the current state of knowledge in the research topic, (2) to identify key authors, articles, theories, and findings in that area, and (3) to identify gaps in knowledge in that research area. Following the steps of Bhattacherjee (2012) we started with scanning previous literature on crises and digital transformation, where we eventually came across the dynamic capability theory. What became evident in this first step was that there was a significant amount of literature, both on crisis management and DT, implying that there was a need to delimit our research to certain aspects. With the final decision of focusing on Covid-19 and its impacts on DC for DT, we used keywords in our search such as "digital transformation", "Covid-19", and "dynamic capabilities". However, a challenge in this sense was finding relevant studies for our specific area since, as mentioned above, the concepts were well reviewed in IS literature. To overcome this, we instead combined some of the keywords, for example "Covid-19 digital transformation", which in turn provided us with more relevant and up to date information. Identifying key articles within our topic according to the second step of Bhattacherjee (2012) then allowed us to look for secondary sources which not only provided us with more insights, but also helped us to verify the validity of the data; something which according to Recker (2013) can be beneficial for establishing scientific quality in a study.

Furthermore, a key aspect in the search for literature is to look for peer reviewed, well established and well cited publications within the researched topic (Recker, 2013). To ensure this in our study, we used Google Scholar, LubSearch, the online library of Lund University, and Gothenburg University online library as our primary sources for data collection. These primary sources were then used from a *basket of eight* lens, meaning that we actively chose articles that were published in any of these top journals. That does not however imply that all articles used for this study were from this specific set of journals, but rather that we used them as a tool for validating our sources when possible. Moreover, according to the third step of

Bhattacherjee (2012), we used the literature review to identify knowledge gaps with regards to Covid-19s impact on DC for DT. As mentioned earlier, all three concepts are well researched, however, their relationship and the specific angle we took with dynamic capabilities is what makes this study unique.

A challenge that emerged during the literature review process with regards to the dynamic capability theory was that the theory originates from the strategic management discipline. That implied a limited focus on technology and more focus on the strategic aspects of managing capabilities in order to make them more dynamic. Since the focus of our study was digital transformation, there was a need to change the perspective of the theory to make it more targeted towards the use of digital technologies. Given this approach we, as mentioned in the literature review, applied a digital perspective on the DC theory to not only make it more relevant for our study, but also to increase the generalizability of the results within the field of IS. Likewise, this goes hand in hand with Recker's (2013) argument regarding the integration of different disciplines to (1) discover theories, (2) apply methodologies and (3) solve real world problems through incorporating different fields of research.

3.2.2 Interviews

In order to successfully conduct the qualitative approach described above, our study conducted qualitative interviews as the main data collection method. Qualitative interviews were identified as the most effective way to collect data as they can provide a deeper understanding into the researched topic (Patton, 2015). Similarly, Recker (2013) argues that the use of qualitative interviews is efficient when the purpose is to generate rich descriptions as perceived by individuals. For Crisis-Driven DT this entailed a subjective understanding of the topic where the main focus was to explore how individuals involved with or in the lead of digital transformations within organizations, perceived how Covid-19 drove dynamic capabilities for companies to digitally transform. Furthermore, it is stated by Schultz and Avital (2011) that interviews engage participants directly and generate contextual, nuanced, and authentic data about their experiences and how it can be interpreted. Thus, applying this methodology on Crisis-Driven DT strengthens the argument regarding the use of qualitative interviews as a data collection method.

There are however some risks and challenges worth mentioning when carrying out interviews. According to Schultze and Avital (2011), a common pitfall when conducting qualitative interviews is gathering irrelevant data, which in essence is dependent on the interview process and structure of questions. If for example the structure were to be strict, that could lead to less relevant data being collected due to its possibility of being considered intrusive. Accordingly, Myers and Newman (2007) argue that researchers should take a more reflexive approach, including contextual details such as reporting the interview process rather than just analysing the results. To overcome these challenges, our research developed a well-structured set of questions, to validate the scientific quality of the study. Furthermore, the ambition with our research was to conduct face to face interviews with skilful and competent stakeholders. However, it is important to remember that although we have taken upon ourselves a study of the current effects of Covid-19 up until now, the pandemic was still ongoing during our study, hence there was a risk conducting interviews in situ. Given this context, we prepared for digital interviews as well. We had hoped to be able to achieve face-to-face interviews, as they increase the level of information one can discern from the ability to read body language, which in turn serves to reduce the interpretive margin of error (Bhattacherjee, 2012). But, in lieu of

the opportunity of being physically present during interviews, we argue that a beneficial compromise can be found in the middle ground between telephone and face-to-face interviews, namely digital interviews, through the likes of video conferencing tools such as Zoom and Microsoft Teams. These digital interviews grant the mutual benefit of putting a face to the voice, in the sense that, and at the very least, facial expressions can be read and interpreted. Also, digital interviews granted us the freedom of extending our search for respondents across borders, increasing the possibility of finding interview candidates and subsequent insights.

Regarding the structure of the questions, we decided to conduct semi-structured interviews. This method allows researchers to take a more flexible approach as it is based on a conversational manner rather than strictly following a predetermined protocol (Recker, 2013; Myers & Newman, 2007). It also encourages respondents to talk more openly about certain topics since it allows researchers to ask supplementary questions (Recker, 2013). Using semi-structured interviews, we wanted to create a personal setting where the respondent felt comfortable to talk freely. By creating this setting, we believe that rich data was more likely to be generated, which in turn led to better insights. Furthermore, we made the decision to assign one of us as interviewee leaders before each interview, meaning that one was responsible for maintaining the structure and asking the main questions while the other acted as an observer, asking follow up questions when necessary. This did not only aid the interview process in terms of avoiding miscommunication, but also allowed the observer to focus only on the respondent which eventually resulted in insightful answers that could have remained unnoticed if we were to go with another approach.

3.2.3 Designing the Interview Guide

Table 3.1: Interview questions in relation to dimensions

Concept	Dimensions	Referring to Question(s)
Introductory/Finishing Questions	-	1, 2, 3, 15, 16
Crisis Covid-19	Covid-19's Organizational Impact	4, 5, 6
Digital Transformation	Digital Transformation Theory	7
	• Use of Technology • Changes in Value Creation • Structural Changes • Financial Aspects	8, 13, 14
	Digital Transformation Hurdles	8
Dynamic Capabilities	Dynamic Capability Theory	9
	• Digital Sensing • Digital Seizing • Digital Transforming	10, 11, 12, 13, 14

The interview guide shown above displays the thematic match between our conceptual framework Figure 2.3 and our semi-structured interview guide as can be found in Appendix 7. The interview guide was meticulously crafted to adhere to the research purpose and to extract insights from the respondents that pertain to the research question (Patton, 2015). The first two introductory questions cover the aspects of confidentiality and privacy regarding the research's interview recording procedure for data collection. As further expanded upon in section Ethical Considerations (3.5), we decided to anonymize names, organizations, locations, and other sensitive data in an attempt to neutralize any qualms that respondents may have had regarding their information and answers. This was also explained in our informed consent protocol that was used when reaching out to respondents (this protocol is also explained further in Ethical Considerations (3.5)). Our protocol covered elements of our research's purpose, how we used the data we collected, and what questions respondents could be expected to answer (Patton, 2015). Confidentiality was placed as a clear focus in the protocol; we reasoned that by showing respondents from the start that we value its significance, we would be able to project a more serious tone, and perhaps increase respondent participation. Thereafter, question three in the interview guide breaks the ice and addresses the contextual necessities that are pertinent to know regarding respondents in order to assure the validity of later findings (Myers & Newman, 2007), such as the respondent's current role and responsibility within their organization, this also served as a segue to ease into upcoming sections (Bhattacherjee, 2012).

In the nature of a semi-structured interview, we viewed the interview guide more as a checklist than as a strict manuscript that was to be followed to the tee. This is where Recker (2013) and Myers and Newman (2007) argue that the strengths of semi-structured interviews lie, as it leaves adequate room for follow-up questions that come forth, off the cuff, as the conversation elopes (Patton, 2015). We let respondents speak unhindered by asking open-ended questions, which helped the dialogue's natural progression, but we made sure to keep a reflective, or mirroring tone, in which we often circled back to previous statements made by the respondent to ask for elaborations or to pose questions of a more presupposed nature (Myers & Newman, 2007). We sectioned the interview guide to enable the use of prefatory and transitory statements in order to help ourselves pace the interview and to let the respondent know through conversational cues that progression within the interview process is being made (Patton, 2015). Yet another technique we utilized was that of verbal and non-verbal affirmation, which helped the respondents feel acknowledged and understood (Patton, 2015), non-verbal affirmation was preferred, when possible, as it reduced the errors that our transcription software made.

The final questions of the interview, fifteen and sixteen, encompassed the conclusion of the interview, in which we asked the respondent if they thought we had missed any question that could generate insight to our study, or if they had any questions to ask us about our research (Myers & Newman, 2007). As a final remark, we asked the respondents if we could get in contact should any questions arise and if they would be interested in reading the study upon its completion; thereafter we thanked the respondents for their time, effort and will to participate in the study.

3.2.4 Respondent Sampling

Regarding the choice of target group, our ambition was to gather data from companies who have orchestrated digital transformation, with a specific interest in the impact that Covid-19 had in driving the transformation, which aligns with the qualitative method of *purposive sampling* (Recker, 2013; Patton, 2015). When scratching the surface of novel areas of research such as Crisis-Driven DT, which we argue qualitative research is well suited for, a purposeful approach to sampling is a viable choice, as it infers that the study seeks information-rich cases that can yield rich insights that illuminate the research questions (Patton, 2015). There are many purposive sampling strategies, we have for our study chosen a "*key informants, key knowledgeables, and reputational sampling"* (Patton, 2015, p.406) or "*expert*" (Battacherjee, 2012, p.69) strategy in which we seek out individuals who have a great deal of knowledge or influence on the matter of digital transformation within organizations, and who can, with their expertise, provide insights that get to the root of the issue (Patton, 2015). This imposed imperative sets our focus on individuals who work predominantly on a strategic rather than operational level within their organization, as these individuals generally have a wider perspective of their organization, which is beneficial when discussing organization-spanning phenomena such as DT, DC, and the organizational impact of Covid-19. Below, a table (3.2) is shown that displays some information about the respondents we have interviewed, however, the information contained within this table has been censored where needed to adhere to stipulated confidentiality agreements.

To get a hold of suitable candidates we used existing connections we had within the industry and platforms such as LinkedIn, where we used research keywords and job titles affiliated with DT, to find and message individuals in the hope that they would be kind enough to participate.

Table 3.2: Overview of the respondents

Respondent	Job Title	Organization	Conferencing Tool	Interview Length
1	Solution Architect	Org1	Microsoft Teams	42 min
2	Product Manager	Org2	Zoom	47 min
3	DT Leader	Org3	Zoom	45 min
4	HR/Product Developer	Org4	Zoom	46 min
5	Chief Innovation Officer	Org5	Zoom	44 min
6	Senior Manager in DT	Org6	Microsoft Teams	21 min

3.3 Data Analysis

3.3.1 Transcription

When conducting qualitative interviews, the respondent's responses are the source of empirical data, it is then the researcher's responsibility to turn these data into findings through analysis (Patton, 2015). But first and foremost, the data must be translated from digital interview recordings into a format that supports analysis, such as text. To facilitate this, we used a service called Otter.ai, which uses natural language processing to translate spoken recordings into transcripts, alongside this, it also recognizes the different speakers by their voices to assign text spoken by who it belongs to. But the software is not perfect, we still had to go through the transcript to check for instances where the software had clearly transcribed incorrect passages and interpretations. Moreover, this is also where we upheld the agreements of confidentiality that had taken place with our respondents by censoring sensitive information that could result in respondent identification. However, it must be remembered that transcriptions are not the purest form of qualitative data, as they are a researcher's constructivist rendition of the interview (McLellan, MacQueen & Neidig, 2003). To minimize our impact as researchers on the transcriptions, we strived to transcribe the interviews as systematically and as close as possible to the way they occurred. This meant we opted to transcribe verbatim as McLellan, MacQueen & Neidig argue is how it should be done (2003).

After each interview, we sat down to initiate the transcription procedure in Otter.ai, but also to discuss the key takeaways and any questions that arose during the interview. Otter.ai also has a feature that performs automatic sentiment analysis, this feature generates keywords from each interview that can quickly give an overview of the main topics covered during the interview, these keywords for each interview are presented in table 3.3 below. After Otter.ai had transcribed an interview, we would go through it to address confidentiality concerns and errors caused by the transcription software. But this initial round of proofreading only made up the first lap in the race that is data analysis; each and every transcription was read and dealt with several times in the following leg of data analysis, which was coding.

Table 3.3: Summary of keywords

Interview	Keywords
1	*pandemic, speeded, speak, customer, transformation, moving, work, payment, agile, teams, big, online, ai, store, markets, home, started.*
2	*company, pandemic, meeting, organization, processes, question, virtual, department, software, digitization, people, technologies, parts, year, investors, opportunity, business.*
3	*people, factory, technologies, machines, operators, digital, customers, dynamic, digitalization, operations, home, supply, introduced, digital transformation, opportunities, upskilling, supplier, business.*
4	*people, customers, solutions, working, company, affected, organization, person, change, business, automation, capitalize, digital transformation, speeded, meeting, dynamic environments.*
5	*customers, people, factory, digital transformation, company, technology, absolutely, business, digitalization, data, dynamic, produce, big, marketing, thinking, trend.*
6	*pandemic, digital transformation, business, organization, digital, settings, transformation, firm, people, setting, technology, depends, speak, work, part.*

3.3.2 Coding

After the interviews were completed and transcribed, a key aspect in the working process was to interpret and analyse the collected data, with the purpose of this being, according to Recker (2013), to develop further insights from the data by giving it context through categorization. Similarly, Patton (2015) argues that analysing the data helps researchers make sense of relevant information. In order to make the process more efficient, we utilized a technique known as coding that structures and organizes collected data by codes (Bhattacherjee, 2012; Gibbs, 2007). The technique consists of labelling codes to words, phrases, or paragraphs with the main goal of reducing qualitative data to meaningful information (Recker, 2013, p.92); in essence, the means is to identify key concepts and then link that concept to a code. Thereafter, all instances in one's empirical data where the same concept is identified, the same code is applied (Gibbs, 2007). Gibbs (2007) specifies two different approaches to coding, the first being data-driven coding, or open coding, which implies that one should seek to find themes from the data itself, the other being concept-driven coding, which in contrast refers to the method of applying predetermined themes from one's theory to the data to generate insights. For our study, we applied a concept-driven approach, which infers the categorization of themes and corresponding codes (that are presented in table 3.4, such as *digital sensing, digital seizing, and digital transforming)*. These chosen themes have a direct connection to the segments of theory that was proposed in the conceptual model (Figure 2.3), as well as the fact that they highlight the different characteristics that pertain to answering the research question of how Covid-19 has driven dynamic capabilities for companies to digitally transform.

Table 3.4: Dimension abbreviation

Dimensions	Code	Subdimension	Subcode
Covid-19's Organizational Impact	COI		
Digital Sensing	DSE		
Use of Technologies	UOT		
Digital Seizing	DZ		
Digital Business Model Change	DBMC	Financial Aspects	DBMC-FA
		Structural Changes	DBMC-SC
		Changes in Value Creation	DBMC-CVC
Digital Transforming	DT	Digital Transformation Definition	DT-DEF
		DT Implementation	DT-I

3.4 Research Quality

A lot of aspects govern the scientific quality of conducting research; we will with this section provide a summary over the factors we have ascribed our focus to when planning and executing our research. Lincoln and Guba (1986) posit a constructivist framework with four criteria; the criteria aid qualitative researchers to uphold scientific rigor within their research.

Reliability, as the term is used in a quantitative context, is based upon a study's repeatability; entailing that the more repeatable one's research is, based on how similar results one produces each time, the better (Golafshani, 2003). However, reliability is argued by some scholars to be better suited as a measure for positivist rather than interpretive research (Lincoln & Guba, 1986; Golafshani, 2003), as exact repeatability, e.g., repeating an ethnographic study of a company that has since gone bankrupt, is impossible. This does not mean that reliability is irrelevant within qualitative research, but instead it should most likely be reframed into something more fitting the qualitative research paradigm. Lincoln and Guba (1986) posit *dependability* as a parallel to *reliability*, which takes a focus on the process of inquiry and the inquirer's responsibility in making sure that this process is well documented, has high traceability, and is soundly logical. This is something we have achieved by crafting our methodology chapter using a clear structure that helps to explain our reasoning as to why we decided to work the way we did.

Validity is in Lincoln and Guba's (1986) constructivist criteria reformed into two separate terms that take the aspects of *internal* and *external validity*, and transforms them into *credibility* and *transferability*, respectively. With this, *credibility* refers to the researcher's effort in providing assurance of compatibility between the respondents' subjective view and the researcher's reconstructed representation of that view. This is something we achieved by having two questions seven and nine in the interview guide (Appendix 7) that referred to our study's chosen definitions for DT and DC, these were then discussed with the respondents in order to ensure that we could come to an understanding of how we saw and understood the terms. Furthermore, *transferability* covers the issue that is otherwise known as *generalization*, in essence referring to the researcher's attempts at providing thick descriptive data-narratives about the context of the study so that judgements can be made by readers regarding the findings fit to other scenarios. This was one of, if not the largest focus we had as researchers conducting a qualitative study, as we chose a semi-structured interview format that asked open ended questions. This gave the respondents a chance to get comfortable talking and increased the likelihood that thick-descriptive data was given.

Fourth and finally, Lincoln and Guba (1986) posit *confirmability*, mirroring *objectivity*, in which the researcher's subjective understanding of the collected data fits with the objective/as-is reality; we have sought to ascertain confirmability through a method known as member checking where respondents have been contacted yet again after their associated interview has been transcribed to check whether the transcription accurately portrayed the respondents viewpoints (Patton, 2015), this helps us ensure that we have gotten transcripts that fully convey the meaning that our respondents have implied.

Patton (2015) mentions that alongside these criteria developed by Lincoln and Guba (1986), we emphasized between ourselves as researchers the importance to remain vigilant in terms of one's own biases and subjectivity, as this in-turn will help to produce more trustworthy interpretations. The aforementioned criteria are what we have taken into consideration in our research to sustain a certain level of scientific rigor; we achieved this by intuitively working

them into our scientific practice and iteratively reviewing our progress in retrospect to make sure they uphold previously set standards.

3.5 Ethical Considerations

As presented in the previous sections the following study adopted a qualitative research method, gathering data through semi structured interviews and analysing the data through concept-driven coding. When conducting research in general, a key aspect according to Recker (2013) is to take ethical considerations into account. This does not only validate the standards of the study, but also provide it with more credibility (Recker, 2013). For our study we have therefore set various ethical standards, both in the data collection process but also when analysing the data. According to Bhattacherjee (2012), there are three main ethical principles when conducting research. The first one, *voluntary participation***,** refers to informing the respondents that their participation is voluntary, and that they are allowed to withdraw from the study at any point in time without consequences. To establish this in our study we formulated our informed consent protocol within an email where the aforementioned formalities were explicitly described before the start of the interview. Additionally, we ensured that if the respondent were to change their mind regarding their participation, they would be fully excluded from the study. The second step in Bhattacherjee's (2012) interpretation of ethical considerations is to ensure *anonymity* and *confidentiality*. As mentioned earlier in chapter Interviews (3.2.2), assuring confidentiality early in the study was of high importance since we believed it could establish a higher level of trust between ourselves and the participants, which subsequently could lead to richer descriptions being given from participants. This was not only done through email, but also during the interviews to make sure that everything that has been said will only be used to serve the purpose of the study. That also included that the final reader of the report will not be able to identify a given response with a specific respondent. Furthermore, in our case, full anonymity could not be granted given that the digital interviews contained both names of the participants and video recording. However, Recker (2013) argues that in such cases, relevant actions must be taken so that, while full anonymity cannot be guaranteed, confidentiality of the data will be maintained throughout the research process. Since both we, and the respondents were aware of the fact that full anonymity is difficult to preserve, we concluded that our efforts to maintain anonymity and confidentiality were sufficient while receiving valuable input. According to Bhattacherjee's (2012) final step, *disclosure*, the researcher is described to have an obligation to provide information about the study before data collection can take place. To ensure disclosure and avoid misunderstandings between ourselves and possible participants, we included in our consent protocol in the start of each email conversation by introducing ourselves and our background followed by the purpose of the study and its possible outcomes. While Bhattacherjee (2012) expressed that there are potential risks involved in disclosing information such as implying bias and subjective thoughts, we decided that the possible benefits of disclosure outweighed the potential risks of not sharing any information ahead of the interviews. Likewise, we realized that the given decision would not affect the possible results negatively.

As for data analysis the study aimed to increase transparency by sharing the results with all of the respondents. This follows Patton's (2015) argument regarding creating a setting where the respondents feel comfortable sharing insights and answers, where we believe that by increasing transparency from the start, we were able to gain more insightful results. Recker (2013) is also involved in the conversation of ethical considerations for data analysis by stating that

honest and complete reporting is a crucial aspect to maintain ethical behaviour throughout one's research. That also includes negative or undesired results even if they contradict the purpose of the study. Given this context, we applied, to the best of our ability, full disclosure in all processes, from the first email to the end of our data analysis and could thereby be provided with valuable insights during the entire data collection process. Even though the outcomes were not relevant for our study in all cases, we were able to present our findings in an objective manner which is one of the key factors when applying a qualitative methodology (Patton, 2015; Recker, 2013; Bhattacherjee, 2012). Finally, throughout the project we also implemented general ethical standards such as avoiding plagiarism, using the correct referencing system when necessary and taking full responsibility for the overall content and results.

4 Results

This chapter will present the findings from our interviews, the findings will be presented in a manner that adheres to our conceptual model Figure 2.3 in order to answer our research question. The interview transcripts can be found in the appendices, any reference to the transcripts will be referred to using format (x:y) where x is the interview number and y is the paragraph. At the end of the results chapter, a table of findings (4.1) is presented to give an overview and summary of our findings and what is to be discussed in the discussion.

4.1 Covid-19s Organization Impact

All organizations that we came in contact with during our study have been affected by Covid-19 in some capacity; some respondents stated negative effects, others positive, and some a bit of both. A notable effect being as Respondent 1 (R1) mentioned where a selection of their stores had to close down (1:4), causing losses in revenue (1:6). Contrastingly, R1 mentions how Covid-19 has sped up their transformation in achieving a better Omni channel presence by focusing on their digital channels (1:20), as R1 puts it, “we couldn’t just sit still and wait” (1:31).

R2 mentions, off the top of their head, that Covid-19 has likely incurred the loss of clients and market share for the organization (Org2) (2:13). On the other hand, R2 also goes on to mention how Covid-19 has forced Org2 to move their processes from being physically bound to the office to being able to work more from home and even flexibly across borders (2:11), partly through the use of new digital working and project planning technologies such as Microsoft Teams and Asana respectively (2:11), but also through their digital transformation efforts in developing an end-to-end digital annual meeting software (2:25), which will be further developed later in this chapter. A specific impact of Covid-19 that R2 mentions, is how it has affected those who have been in the organization for a long time and who’ve grown accustomed to their largely analog ways of working, an example being how it has forced one colleague to reconsider her habit of printing every email she receives as the costs of ink stack up when it's on her own dime (2:46; 2:48) All in all, R2 points toward the shift in digital work assisting tools going from being optional to being required (2:48).

R3 gave accounts of how Covid-19 has affected Org3 in terms of supply chain disruptions, production line slowdowns, and limitations in their sales forecasting methods (3:11). But simultaneously the opportunities that arose from the pandemic also allowed for Org3 to sell more of their product as the demand rose (3:11). Org3 had begun digital initiatives already since 2014 (3:19), but Covid-19 did accelerate the adoption of innovative technologies and helped drive existing initiatives to fruition (3:27; 3:29). R3 points to how this has helped Org3 in current times with the dynamic environments that have been introduced by the Russia-Ukraine war (3:29), as it has made Org3 rely more on data than intuition (3:47).

R4 shared insights as to how Org4 did not feel any major effects in adapting to the effects of the pandemic, this was due to the malleability of their solution (4:10). Unavoidably, some portions of the business were still hit, specifically Org4’s operations in India (4:6), as India’s government enacted more stringent restrictions than other parts of the world (4:24). However, R4 mentioned that it had slightly changed the way that Org4 worked; for example, R4

mentions that before Covid-19, Org4 predominantly looked at hiring candidates in the general vicinity of their headquarters, but "now we (Org4) can be everywhere" (4:36). But, R4 still mentions how Org4 did find complete digital onboarding to be an arduous process (4:6).

Similarly to Org4, R5 also mentioned the problems that Covid-19 has brought about in digitally onboarding new staff, as an important aspect in getting employees used to the working process has to do with being physically present, it is also hard to make a person feel like they belong to something entirely through digital means (5:4). R5, like other respondents, captures the challenges associated with remote work in Org5; but also, with the training they engage in with customers as a part of their value proposition, that now has to be digitally facilitated (5:4). Yet another insight as to the effects of the pandemic that R5 disclosed, showed industry wide security flaws among Org5's customers, where rapid technological adoption among industrial companies who earlier have not needed to share much information to keep business afloat, gave rise to a surge in cyber-attacks (5:8).

R6 discussed the implications of keeping a healthy work life balance when faced with remote work, especially for those with children or lacking the appropriate space to work from home (6:15). In the grand scheme of things, R6 mentions how as a consulting firm, work was rife, and business was busy (6:15). Another effect of Covid-19 that R6 mentioned was how companies that relied on transitory staff, on temporary visas, were very much at the mercy of the laws and restrictions that the governments in the associated countries had set, making it difficult for select industries such as the hospitality sector to stay afloat (6:17).

By taking a broad perspective and glancing at the different takes that our respondents had, some trends become apparent in the way that Covid-19 has impacted organizations. Respondents 1, 2, 3, 4 & 6 explicitly stated that Covid-19 has accelerated the digital transformation efforts that their organization had taken on, either internally or externally (1:20; 1:31; 2:48; 3:27; 4:51; 6:25). R5 did not comment outright on how they perceived Covid-19 had impacted their organizations digital transformation efforts, positively or negatively. However, R5 did mentioned that on a larger scale, Covid-19 did make Org5 rethink their end-end working procedure regarding marketing and sales as the manner in which this was to be achieved had fundamentally changed in response to pandemic related restrictions, this will have more light shed on it in chapter Changes in Value Creation (4.5.3).

4.2 Digital Sensing

R1 gave an insight as to how problematic a specific issue of customer service had become upon the onset of Covid-19 induced remote work in the US. Org1 has facilitated the US customer base's need to dial in by phone to place orders, a habit R1 thought US customers have been slow to wean away from in favour of digital channels (1:14). Nonetheless, it was an important stream of revenue for Org1 to uphold, but with customer service workers working from home during Covid-19, the business process did not comply with regulations regarding safe payment procedures any longer when asking customers for their card details (1:14). This implied the need to change the manner in which Org1 could take payments from their dial-in customers. How exactly this technology was achieved is explained further in Digital Seizing (4.4). As a closing remark, R1 mentioned how Org1 have pushed the envelope recently in terms of becoming data driven, in order to facilitate technologies like predictive analytics and AI, which Org1 are starting to find use for even if R1 says they are not fully there yet.

R2 explained how Org2 had developed an end-to-end *annual general meeting* (AGM) software that enabled companies to follow through with their legally required general meetings during Covid-19 and after (2:25). The implications of what Org2 went through to develop the software and how they capitalized from it will be delved into further in sections Digital Seizing (4.4) and Digital Transforming (4.6). But R2 mentions that the digital sensing that went into fostering the development of the service had partly to do with its legal requirement from governments across the world (2:11), but also from Org2's positional perception in their market (2:13; 2:30). This entails that Org2 thought it was only a matter of time before meetings would go virtual, despite the pandemic, be it 10 or 20-30 years, but it was nevertheless bound to happen, and Org2 saw their opportunity to capitalize (2:30). By having this strategic vision before Covid-19, Org2 had already laid the digital foundation for the development of the service and were therefore ahead of their competitors in getting the service to the market (2:30). Furthermore, like Org1, R2 mentions how Org2 always strives to ensure that their decision making is as data driven as possible, R2 mentions that, as a product manager, if a proposal for a decision is pitched without data, then it is highly likely it will not be regarded (2:38).

R3 pointed toward Org3's use of dashboarding and data analytics as tools to sense capabilities in light of the pandemic (3:19; 3:27) and that they became more data driven during the pandemic (3:47). An example of this being how Org3 went from orchestrating supply and operations planning once a month to once a week, as a rapid response to Covid-19's supply impacts, thanks to their significant data analytics and dashboarding capabilities (3:19). R3 also went on to mention the key digitalization initiative Org3 call their *well spring*, which is where Org3 focus on administering their internal resources to achieve an end-to-end connection or "seamless, touchless, integration" (3:25) of their supply chain (3:21). Org3 built upon this backbone of data by introducing iPads to every operator within their factories that contained apps with information about machines and facilities to facilitate upskilling of employees (3:51). This avenue will be discussed more in later chapters Structural Change (4.5.2) and Digital Transforming (4.6).

Org4 were, according to R4, very digitally adjusted before Covid-19 (4:24; 4:32). This had the effect that Org4 did not face the need to initiate many drastic changes or leverage many new technologies; however, what Org4 did do to digitally sense new capabilities was firstly to make use of master students conducting research within AI or data science to draw from the latest innovative talent that universities are producing and provide them collaborative opportunities at Org4 to jointly innovate (4:32). Secondly, Org4 work internally with the topic of automation by organizing hackathons for their employees, with a specific focus on automation to derive solutions to problems from internal resources (4:32).

In a similar people-oriented vein, R5 disclosed that a vital aspect in Org5's sensing of capabilities occurs through people; but finding people with the correct talent is arduous, therefore a lot of what has been taking place at Org5 during Covid-19 is up -and re skilling to internally create the talent that is required (5:20; 5:26).

When taking a more general look at the themes that were displayed among the different organizations regarding their efforts that can be argued to fall under the category of digital sensing, some overarching trends came to light. One trend that became apparent was the focus on finding people with relevant competencies before technology was brought into the conversation, this couldn't always be done externally, therefore upskilling and reskilling became of importance (3:49; 3:51; 5:20; 5:26). All respondents have more or less mentioned the need to

adhere to rules and regulations as a response to Covid-19, but Org1 and Org2 went as far as to create a technology or software platform to facilitate the required change (1:14; 2:25).

4.3 Use of Technology

Following the question of whether the respondents will continue to use the technologies adopted during Covid-19 after the pandemic, all respondents answered undoubtedly yes (1:16; 2:50; 3:51; 4:63; 5:37; 6:45). A common theme found in this context was the move to hybrid work environments, which was described as one of the most eminent technologies that will be maintained in the organizations after the pandemic (2:50; 4:10; 5:41; 6:45).

"*I think most businesses will probably opt towards a hybrid model.*" (6:47)

"*The hybrid needs to be there. It will stay forever. Yeah*" (5:41)

Other mentioned technologies that arose during Covid-19 were virtual meeting tools like Microsoft Teams (3:45; 4:63) and Zoom (6:25), but also cloud services such as Azure Microsoft Cloud (1:30), Google Cloud (4:32), and Asana (2:11). All of which had a big impact on the adoption of technologies, and that will be used continuously throughout the different organizations.

In a unique perspective, the use of technologies proved to have an excessively unfounded role in terms of driving digital transformation (5:12). This became evident through a DT effort described by R5 in which the customer of Org5 seemed to lack complete knowledge of what the technology they were seeking actually imposed for the firm. Thus, while the customer was more focused on using the newest technology, Org5 instead insisted on engaging all parts of the customers value and supply chain to succeed, which also seemed to be the right solution for that particular customer (5:12). Similarly, R6 implied that solely focusing on technology rather than other important aspects is a common pitfall amongst incumbent firms. The key aspect, as argued by R6, is to look at the specific setting to determine the right approach, and then start to involve certain technologies that could be of use (6:19).

"*But I think sometimes, particularly in a lot of contexts, people sort of jumped to technology before they actually think about and understand what the problem or the user-need actually is*." (6:19)

4.4 Digital Seizing

It became evident in the interviews that the respondents had very different perspectives of what seizing could include. Still, all respondents consistently displayed examples of how and what they did to capitalize on the opportunities presented through their sensing of Covid-19.

R1 began by stating that the transformation of their business was facilitated as a result of Covid-19, however, R1 made it clear that the transformation was already in progress before the pandemic and that this was the main reason for them successfully being able to adapt to the dynamic environment (1:10). To display an example of seizing opportunities from sensed market trends, R1 further explained that the pandemic pushed them to develop a so-called

Pay-By-Link (PBL) system that allowed their customers to continue conducting phone order transactions in a compliant manner (1:14).

> *"So we developed something we called PBL. And, and then the customer service rep when they come to the payment stage. They just click the PBL service and then they get the link back and then they can copy that link and send it to the customer via email or WhatsApp or whatever. And when the customer click* [sic] *that link, they will land on a secure page where they can perform the payment and then the payment will be notified back to the order management system and and* [sic] *then the order will be paid. And that can be sent to the warehouse for picking and packing and sent out to the customer. And so I think that's kind of an example, that that actually made us work a little bit smarter and safer because of the pandemic.*" (1.14)

What became apparent as a result of Org1's aforementioned solution was its applicability in other aspects than originally thought, an example of this being Org1's new *pay for me* (PFM) functionality (1:16). Org1 found a use case in which younger clientele can ask their parents or guardians to pay for their products through a link in Org1's app when checking out at a store or online (1:16). R1 went on to mention how the PBL technology they've developed as a means to keep the option of paying by phone afloat in the US, has of late also found its use in the EU too, as the EU has stricter regulations regarding multi factor authentication in the form of PSD2, and this technology has use-cases when developing solutions to adhere to the directive (1:16; 1:54).

Similar to R1, R2 acknowledges that Covid-19 enabled various opportunities for Org2 to capitalize on the events that were presented. One key reason for that was described as being quick to market with their products which in turn was a result of good preparation (2:30). When the pandemic hit, rather than being passive and waiting for the competitors to act first, R2 stated that Org2 were able to react quickly to seize the opportunities that were presented, which also contributed to Org2 establishing themselves as described by R2 "*the* provider of the solution" (2:30). Accordingly, by sensing that change was about to take place, Org2, managed to use technology to seize an opportunity given as a result of the dynamic environment.

As opposed to previous examples, R3 instead places particular emphasis on the ability to implement flexibility as a direct result of Covid-19. It is described that the pandemic allowed for Org3 to implement more automation in their factories since people were not able to work due to restrictions (3:38). With the decrease of actively working people, less decisions had to be made, thus allowing Org3 to assign tasks in a more flexible manner so that the employees in the factories could work on other important assignments (3:25). This eventually resulted in a situation where the factories who had a higher degree of automation, were able to produce more as opposed to those who had not implemented autonomous processes (3:25). However, it is also in this sense important to note that the majority of the factories within Org3 were autonomous before the pandemic hit, hence the contribution Covid-19 made was more about automating already existing processes rather than creating new ones from scratch. Still, R3 would display the example as one of the opportunities Org3 were able to seize as a direct result of Covid-19 (3:25).

In accordance with previous interviews, Respondent 4 explained that Org4 were able to capitalize on opportunities brought about by Covid-19. The main takeaway, R4 mentions, is that the pandemic forced them to increase communication with the customers as well as within the organization to be able to improve their services (4:49). A practical example of that was when

Org4 created a solution that they contained within a subsidiary brand, for distributing packages in a smarter manner by connecting the supplier and the customer. This solution allowed for the customer to track the package and the supplier to share an estimated time of delivery, hence leading to the service being able to run more efficiently (4:49). While the solution was not a direct result of Covid-19, it nonetheless forced them to implement the solution more quickly since the need became substantial, thus allowing them to take advantage of the dynamic changes in the environment (4:51).

On the other hand, Org5's remote control factory solutions have been instrumental for many of their customers efforts in overcoming pandemic related challenges and R5 states that it is also one of Org5's most important solutions they have facilitated (5:4). Alongside remote-control solutions, Org5 also specialize in resource planning solutions that have been well adopted by customers in light of global supply chain disruptions (5:8).

Respondent 6 did not provide any specific examples on how they capitalized on Covid-19. Nonetheless, it was evident R6 believed that the pandemic created numerous opportunities for companies to become more competitive in dynamic environments (6:35), as stated by R6:

"I think, where organizations were able to capitalize were the ones that were able to pivot their operations in response to the need." (6:35)

4.5 Digital Business Model Change

4.5.1 Financial Aspects

It became evident in the interviews that the respondents had a similar view on the financial aspect being a less important driving force during digital transformation efforts. As described by R1, this is because incumbent firms such as Org1 have better economic resources than for example a start-up business since they not only have more capital, but also are able to lend money more easily when needed (1:52).

"But again, there is an advantage with, you know, a big player, because we have lots and lots of money on the bank already. And if we need more, we can can [sic] *easily borrow money. So that's an advantage from, from* [sic] *being big, so to speak."* (1:52)

Similarly, R4 stated that since Covid-19 allowed Org4 to grow quicker than before, there were no financial restrictions that affected the DT efforts within the organization (4:59). As for remaining respondents, they either agreed with the statement above or were unable to talk about the financial aspects due to confidentiality (3:25; 5;35).

4.5.2 Structural Change

Structural changes within the organizations proved to be one of the most prominent factors as a result of Covid-19 in this study. All respondents had examples of such changes where agility and flexibility were suggested to be the two most important structural aspects with regards to DT. R1 began to explain a change from internal data centres to Microsoft Azure Cloud, where Org1, as a result, could become more agile (1:30). Additionally, with the move to cloud

followed a need to hire new competence, which eventually led to Org1 going from outsourcing to moving things more inhouse, something that was highlighted as a result of the cloud transformation where things became much easier to work with (1:30). R1 then concluded that going from working according to waterfall models to working with agile methodologies was the single most important structural change Org1 implemented to stay competitive in the dynamic environment (1:50).

R2 goes on to mention that looking at internal resources rather than external was a key task when adapting to changes in the environment (2:36). This was in turn enabled through having flexible resources, setups and processes that were interchangeable so that they could be adjusted according to market needs (2:36). However, the process of structural change is not to be underestimated, as some parts of the organization can be more rigid and thus resistant to change. Increasing flexibility with regards to organizational structure was therefore described as a success factor for Org2 during DT efforts (2:36). R2 further states that they believe that the parts of the organization which were more agile, performed better (2:44).

> *"*[…] *so definitely, some parts of the organization have been more flexible than, than* [sic] *others. And you can definitely see where you have more flexibility, typically, the transformation process has gotten a lot better than when, in the parts which are more rigid."* (2:36)

Moreover, R2 explains that Covid-19 has enabled Org2 to work more cross borders, which in turn has increased the collaboration between different offices working from different countries (2:50). This has allowed for Org2 to transform from developing local products for specific countries, to now developing systems and services that can be upscaled to international markets (2:50). In that way Org2 have been able to erase geographical constraints that have existed since before the pandemic. (2:50)

As opposed to previous respondents, R3 states that organizational culture was one of the most important components of structural changes within Org3 (3:36). Through changing the culture from within, Org3 were able to focus on upskilling internal resources to enhance communication between different parts of the organization (3:49). As the communication then was improved, R3 states that Org3 could implement a bottom-up approach which was described as one crucial structural change that took place during the pandemic (3:53). In this sense, while not implementing agile methods in full context, Org3 still managed to change their internal structures so that it was more responsive to dynamic environments (3:53).

In accordance with R2, R4 stated that they made structural changes to open up their business more to acquire people from other parts of the world (4:49). This did not only provide Org4 with new employees and competencies, but also gave them the opportunity to increase diversity within the organization which can be aligned with R3s argument regarding the importance of organizational culture. Accordingly, the more diversity a company has, the more likely it is to combine resources to succeed with DT (4:49). However, R4 points out that Org4 are in the beginning of the organizational change with regards to their subsidiary's tracking solution, hence it is too early to determine the outcome of whether it will be temporary or the way forward (4:55).

Also, like previous respondents, R5 stated that changes to internal structures will be crucial to succeed in dynamic environments (5:30). Which includes, upskilling, or even reskilling internal competencies so that employees, on all levels of the organization are, as described by R5, "doing the right things" (5:20). For instance, Org5 recently started an agile course available to

all employees as a response to changing customer needs, as well as webinars offered to the customers free of charge (5:24; 5:26). The purpose of this, according to R5, was partially to familiarize the customer with digital technologies but also to make sure that the relationship between Org5 and the customer was maintained, or even enhanced throughout Covid-19 (5:24; 5:26).

"*I think even internally, we really almost, I should not say force, but we really, really motivated our people to go and do some training that they will never, ever have done before. Because we were not used to do virtual training, right? We were paying people to go somewhere for three days. But now we figured out there are so many good trainings that they can actually do remotely.*" (5:28)

Consequently, by making these structural changes Org5 managed to increase the digital maturity both internally and externally, as well as focusing on other, more important work tasks that were enabled through less traveling (5:31).

"*Yes, digital maturity. Absolutely. And also more, more time to spend, looking into what's coming next, you know, future technology, future trends, and take* [sic] *the time to discuss it with customers in a way that we didn't take time before. Because we lost a lot of time*" (5:31)

Finally, R6 implied that the agile parts of Org6 were the ones that were able to benefit from the pandemic (6:35). Those parts who had flexible resources and structures were able to pivot as opposed to those parts who were rigid, which is aligned with what R2 stated about incumbent firms' inability to change when it is necessary. Lastly, when given the question of how structural change could impact a firm's ability to navigate dynamic environments, R6 stated:

"*Part of the business has always welcomed change and always had to be agile to pivot. And to respond to things. [...] being able to embrace ambiguity and actually work through that is absolutely critical because the entire pandemic was actually about ambiguity. Nobody had any certainty about what was going to happen next [...]*." (6:37)

4.5.3 Changes in Value Creation

The results from the interviews came to acknowledge several changes in how the firms' created value both before, and after the pandemic. As stated earlier in section Digital Seizing, Org1 managed to reach out to the younger generation by implementing their PFM solution, thus allowing for yet another customer channel to open up (1:16). R1 went on to explain that the current environment has forced Org1 to both expand into new markets as well as moving out from others such as closing down all operations in Russia and Ukraine (1:46). A key factor in this sense, which is to be able to capitalize on changes in value creation, was described by R1 as:

"*I think it's all about being agile, you know, the world is changing, and we don't know what happens. Next time, it will come as a surprise and then the only thing we can do is to be more agile, adaptive to change I think*." (1:46)

In terms of how newly digital technologies have been implemented to replace previous analog activities, R2 stated that a lot of effort has been put into looking at internal processes and placing them in a virtual context (2:42). Analog activities have been more or less forced to move to digital meetings, leaving Org2 with the challenge on how to appropriate new value

for the firm in this new setting. However, rather than focusing on the challenges, R2 stated that Org2 were optimistic about finding new ways of creating value both internally and externally as a response to the dynamic environment (2:42).

On the other hand, R3 mentioned that Org3 were able to create more value for their customers by implementing shipment monitoring (3:25). This solution did not only allow for the customers to track and plan for the arrival of the shipment, but also for Org3 to organize the logistics within the warehouses so that everything was sent to the correct destinations with the right specifications (3:25). In this sense, Org3 managed to appropriate more value for the customers and at the same time use technology to add value to their internal network (3:25). In another context, R4 mentioned that Org4 some years back implemented an initiative called *the data driven mindset* (4:32). The purpose of the initiative was to reflect upon how Org4 as a business could use information to create more value for their customers. To accomplish this, all employees were encouraged to think of one thing every day that could help Org4 appropriate more value both for customers and internally, such as using existing data to support decision making (4:32).

Similar to Org3, R5 stated that their way of creating value for customers arose from digital monitoring tools where the customer now was able to watch the data from home (5:4). With this new remote connection solution, Org5 expanded their customer base since it enabled an employee from one country to monitor the data input from a factory in another country in real time (5:4). Furthermore, since Org5 work in a consulting capacity and offer digitalisation solutions to customers within industrial sectors, they have realized a need to revamp their own internal affairs in order to approach the onslaught of pandemic related challenges that both Org5 and their customers are facing (5:14). But R5 mentions that there have been difficulties in marketing their solutions during Covid-19, as normally conferences play a large role in Org5's marketing strategy (5:6), but seeing as these events have largely been cancelled during the pandemic, new means of digital marketing have had to come to fruition simultaneously, this has implied extensive internal reconfigurations of Org5's marketing and sales teams to instead seek and utilize digital channels, such as social media with LinkedIn being an example (5:35).

4.6 Digital Transforming

4.6.1 Organization 1

Org1 have as previously mentioned introduced a PBL service to remedy the US market's need to dial in and pay for their orders (1:14). Upon the realization of the PBL technology, it was understood that it had use-cases in other projects too, namely the PFM service Org1 was looking at implementing, and for its routine use in Org1's operations within the EU to abide by PSD2 (1:16).

Yet another capability that R1 mentioned that Org1 was working on, which had been impacted by Covid-19, was their internal omni-channel transformation (1:8). This transformation has to do with Org1's will to align the organizational channels that make up Org1 to work with less hitches, an example of this has to do with Org1's will to be able to match their organizational make-up to their customer behaviours' during Covid-19, when stores couldn't

operate at full capacity, and customers were forced to purchase through Org1's online channels (1:20). ORIS or *online returns in store* was a new project that was tested during the pandemic in which purchases customers made online could be returned in store, which R1 said increased customer convenience (1:20),

"*[...] but it's also good for us because we drag the customer into a store and when they do that return process, they very often tend to buy something else at the same time*" (1:20)

4.6.2 Organization 2

Org2 have developed an end-to-end service that is used to ensure fully compliant virtual AGMs for companies who wish to, or in the case of the pandemic, have been forced to conduct them virtually (2:25). R2 mentions how the software emulates all the physical activities that may occur during an AGM while at the same time having the possibility to be used in a hybrid nature as well, meaning that some participants can participate online, while others can be in situ (2:25). R2 stresses the importance that all activities that occur during a physical AGM, such as creating agenda points, casting votes etc., need to be equally possible in the software, as each participant has a legal right to partake and act during the meetings (2:25). R2 continues by explaining that besides the focus on developing this specific software, Covid-19 has impacted the way Org2 works in a myriad of ways (2:42). With the move to digital means of collaborating with Teams and Asana (2:11), R2 divulges that work "has become much more digital in nature now" (2:50), and that "I've started working a lot more cross border" (2:50). Overall, with the change in work-life balance when working from home, R2 posits

"*[...] if the company had sort of told everyone to come back to the office full time, every day, there will be a lot of people jumping ship.*" (2:50)

4.6.3 Organization 3

Org3, as an industrial organization, have seen large Covid-19 impacts due to both the effects of social distancing and supply chain disruptions (3:11; 3:25). Even before the pandemic Org3 had worked to involve innovative technologies and lay the foundation for a good level of digital maturity (3:21). R3 stated that Org3's work before Covid-19 had a focus on implementing a "seamless, touchless, integration of our supply chain" (3:25). This strategic vision included automation in the form of automated guided vehicles and automated warehouses (3:25). R3 was clear in stating that automation was a benefit during Covid-19 as it both reduced the needed workforce as less people had to be present to comply with restrictions, but similarly also when employees did fall sick, processes could continue as usual (3:25).

Automation was not Org3's only focus during the pandemic, several other technological initiatives were implemented or pushed forward in their development during the pandemic alongside those already present before it, such as:

- Factory digital twin: in which a factory is modelled in a virtual environment similar to Google Streetview (3:25)

- Augmented reality: in combination with the digital twin technology, top level employees could use augmented reality to go on country visits and inspect other plants' facilities (3:25).
- 3D printing of spare parts: to combat long lead times as a result of supply chain disruptions (3:25).
- Connected worker initiative: every operator received an iPad with apps that aggregated information from other machine operators about machines and facilities within a factory, and how the machines were to be checked, maintained, and operated. This served to facilitate operator upskilling within Org3, which was needed when sickness and operator absence was rife (3:51).

4.6.4 Organization 4

R4 showcased how Org4, as a digitally mature company, did not need to facilitate much of a change in response to the pandemic (4:24; 4:32). They had established practices of using master students' conducting their theses within data science and machine learning to gain fresh insights, and simultaneously organized hackathons internally to foster new ways of automating work (4:32). R4 also disclosed an external project in the works with a subsidiary to Org4, where a solution for delivering packages was created to connect the customer and supplier in an efficient manner by cutting out any middlemen (4:49). This solution allowed for enhanced tracking opportunities and opened avenues for improved manners of conducting business (4:49). R4 was clear in their reasoning that the initiatives described at Org4 were not a direct result of the pandemic, rather Covid-19 mostly served to hasten or increase the speed at which initiatives progressed onward (4:51).

4.6.5 Organization 5

R5 delved into how Org5 were facing digital transformations both internally and externally, in more of a consulting capacity (5:14). Internally, Org5 have needed to rethink aspects of their marketing and sales, as before the pandemic, conferences played a large role in Org5's marketing and sales outreach (5:6). However, upon the cancellation of such events, there was a need to pivot to digital channels, such as LinkedIn, to facilitate and fulfil the need (5:35). Externally, Org5 have been working with a company to help manage and optimize their production to reduce energy consumption during times of increased energy cost (5:16). This was achieved by running their industrial machines at varying efficiencies at varying times of the day when prices were lower (5:16). Another example of how Org5 have externally been involved in digital transformation efforts is with a company producing sausages (5:12). The plant manager wanted to operate at full efficiency but was currently only at 80%; the plant manager had heard tech buzzwords through the grapevine that could revolutionize his factory and was curious to know what could be done (5:12). The solution did not have too much to do with technology in the end, rather the solution lent itself to reconciling the fact that the plant manager had no complete connection between himself, his suppliers, and his clients; R5 mentioned how this factor needed to be addressed on an equal plane of importance to the digital factor of acquiring new technology to facilitate the link (5:12). What was implied by R5 was that the digital transformation of the plant has equally as much to do with completing the value chain and adjusting the associated business models as it has to do with acquiring the latest and greatest technology (5:12).

4.6.6 Organization 6

Regarding DT, Org6 have more so worked in a consulting and external capacity rather than in an internal capacity, however due to concerns regarding confidentiality and time restrictions during the interview, not too much information was possible to be disclosed regarding Or6; instead, R6 kindly shared their personal perspective on our research topic and what followed was a more general discussion. In any case, some of the key findings that R6 provided referred to how many of the digital tools that Org6 have adopted as a result of the pandemic have been developed into Org6's working culture faster than what was otherwise probable (6:25). These digital tools refer to Microsoft Teams and Zoom and have been used mainly to facilitate remote work (6:25). R6 does not think that hybrid work will come to replace work as it has been known up until now, but R6 does think that there will be a balance between them as the pros and cons have their advantages for different companies in different contexts (6:45).

4.7 DT Definitions Qualms

An interview question among all respondents that brought about a lot of interesting opinions refers to question seven in our interview guide. This question frames our study's definition of the term DT, and followingly asks our respondents for their take or on it or if they may have a different definition. The definition we have provided for this study refers to Verhoef et al. (2021, p.889), who define DT as a "change in how a firm employs digital technologies, to develop a new digital business model that helps to create and appropriate more value for the firm".

R1 agreed with our definition and thought it sounded logical. R2 thought the definition provided a good summary, but argued that it did not pertain to any specific level of scale regarding a digital transformation (2:23), "[...] *a digital transformation can,* [sic] *can be big, or it can be small right?*" (2:23). Yet another note of interest is the use of the term *digitization* in the context of discussing a project in the scale of creating a digital business model (2:23), this is later contrasted with the same use of the term when describing a smaller process "[...] like not printing your emails anymore." (2:59). R3 moved the topic of discussion to how Org3 does not really define DT as having too much to do with developing new business models; instead, it has to do with supporting the current business with *digitalization* (3:32). It is not about disrupting the business model; it is about improving it (3:32). R4 was fond of and agreed with the definition but implied that it was not how they would have phrased it, on top of this, R4 put emphasis into the aspect that creating more value was important in several aspects (4:30). As creating more value in R4's opinion refers to creating value for colleagues and customers alike; furthermore, R4 inferred that their definition would revolve around putting their "[...] data driven mindset first, but always have the people first in mind [...]" (4:30). R5 gave a rich and nuanced answer, off the bat mentioning how DT "[...] is not about the technology at all" (5:12). To explain this, R5 referred to how the term digitalization points toward the notion of turning processes into technology to get the best output, but DT is more about the business models, the people, and the value chain (5:12). R6 reflected over the definition and replied that it is not how they would define it, as in some situations it is about business models, but in other settings it is more about improving efficiencies in your business or reaching a new set of users, but ultimately it boils down to the setting (6:19). To expand upon what was meant, R6 continues by mentioning that

"[...] *a bunch of it is now about orientating experiences around user…* [sic] *customers. And how do we use or enable those experiences through technology to then generate efficiencies, savings, whatever it is in the overall operating model. Those savings and transformation is* [sic] *enabled by technology. But I think sometimes, particularly in a lot of contexts, people sort of jumped to technology before they actually think about and understand what the problem or the user need actually is*." (6:19)

4.8 Table of findings

Table 4.1: Summary of results with cause and effects

Dimension	Cause		Effect
Covid-19's Organizational Impact	*Loss in revenue* *Loss in market shares*		*Accelerated DT*
Digital Sensing	*Supply chain disruptions* *Social distancing legislation* *Difficulties with digital onboarding*		*Aversion of security risks* *Adherence to legislation* *Finding right competencies* *Digital maturity* *Move towards data-driven mindsets*
Use of Technology	*Work from home* *Less focus on technology*		*Enabled hybrid work environments* *Use of data analytics, AI, 3Dprinting, IoT, VR, AR* *More focus on the people involved*
Digital Seizing	*Less people working* *Less decisions to be made* *Bad communication*		*Covid-19 enabled organizations to seize opportunities*
Digital Business Model Change	**Financial**	*Incumbent firms*	*Less important*
	Structural	*Dynamic environment* *Difficulties with outsourcing* *Difficulties with collaboration*	*Organizational agility* *Upskilling and Reskilling* *Enabled Cross-Border collaboration*
	Value Creation	*Closing operations* *Replace analogue activities*	*Engagement in digital channels* *Changes to value network*
Digital Transforming	*The need to implement sensed and seized opportunities*		*Sticky digital consequences (Remote work, new technologies, organizational agility)*
DT Definition	*Different views of what DT actually is*		*Discrepancy between the practical and academic definition of DT*

5 Discussion

This chapter will present comparative analysis of our findings in contrast with literature in a manner that adheres to our conceptual model Figure 2.3 to answer our research question. At the end of the discussion, an enriched conceptual model is presented (5.1) that summarises our key points of discussion.

5.1 Covid-19s Organizational Impact

All respondents noted that their organizations had been affected by Covid-19 in some capacity. A consistent trend, with all but one respondent's explicit acknowledgement, referred to the pace that Covid-19 had sped up organizational DT efforts. This finding is congruent with previous research, in that Covid-19 has sped up DT (Amankwah-Amoah, Khan, Wood, & Knight, 2021; Almeida, Santos & Monteiro, 2020; Soto-Acosta, 2020; Wade & Shan, 2020). What is intriguing is the notion of how Covid-19 came to affect organizational DT? Despite the limitations of this thesis, in aspects of time and other resources, trends have become apparent and will be covered in detail in subsequent sections of this chapter with regards to the three inflections of DC, Digital Sensing, Seizing, and Transforming.

Some overall trends regarding the organizational impact of Covid-19 showed that hardships in organizations were rife during the pandemic; with examples such as the closing of stores in Org1, loss of market share within Org2, supply chain disruptions and production line slowdowns in Org3, difficulties digitally onboarding new staff in Org4 and Org5, and problems with work life balance in Org 6. Despite this, organizations showed resourcefulness and managed to sense and seize new capabilities to transform themselves and the situation for the better. A few of the general themes that were displayed en masse among respondents, pointed to the adoption of digital conferencing and communication platforms such as Zoom, Microsoft Teams, Asana etc. to facilitate the work that needed to be done from home. But the general consensus among the incumbent firms we interviewed was the relative prosperity in business that was encountered during Covid-19. However, rather than viewing the growth as a direct result of the pandemic, this study suggests that Covid-19 particularly acted as an initial push towards DT, and that factors such as loss in revenue and loss in market shares were the actual driving forces behind DT during the pandemic. In this sense, it is valid to argue that Covid-19 brought about external pressure which in turn forced organizations to act in order to stay competitive. Hence, depending on the actions taken by different organizations, Covid-19 can be viewed both as a bounding and driving force with regards to digital transformation.

5.2 Digital Sensing

Digital Sensing refers to scanning environments to identify opportunities and threats (Steininger et al. 2022). One of the major threats that organizations faced in this sense were the sudden changes in legislation that occurred as a result of governments reacting to the spread of the pandemic (Deb et al. 2022). In some instances, not a whole lot could be done, such as with nonessential business closures (Maloney & Taskin, 2020). But social distancing mandates presented the opportunity for workarounds, such as with Org1's PBL solution, in which US

legislation forbade the handling of customer card details over the phone, as it presented a law violating security risk with call centre workers working from home. A quick adaptation to legislation allowed for Org1 to realize the value in their newly created PBL solution, which had further prosperous applications in Org1's PFM solution and in their EU operations to cater to PSD2. In a similar vein, Org2 managed to achieve a similar feat by creating their AGM software, as legislation had forced companies to quickly manage the issue of having to host annual general meetings virtually, and since no completely virtual and legal solution for the issue existed, this pressured Org2 to act quickly on the capability. Alongside the pressure of legislation, Org2 also found themselves in an advantageous position as a result of their strategic vision of virtual meetings becoming the norm before Covid-19. Org1 and Org2's examples constitute the two findings presented in the findings table (Table 4.1) "Adherence to legislation" and "Aversion of security risks."

Warner and Wäger (2019) posit that one of the aspects of utmost importance in achieving successful endeavours with organizational digital sensing is through changing the organizational culture to support it. This is a pre-emptive value that Org2 have long since had before Covid-19, which they expressed they had developed through having the strategic vision and foresight to build the technological foundation required to develop the service and get the leg up on their competitors. In a similar mindset, Org4 have also found this *digital maturity* (Warner & Wäger, 2019) by adopting a data driven mindset several years back, this mindset included initiatives to propel ideas and innovation among employees as to how Org4 could establish better data driven decision making, to achieve this, employees were encouraged to every day think of one thing that could create more value for themselves or their customers. Other techniques Org4 used to increase their ability to digitally sense was to initiate research collaboration with master students in data science/AI, alongside this Org4 also organized hackathons internally to promote automation. Alike Org4, Org1, Org2, Org3, Org5 have all, in different capacities, applied a data driven and analytical approach to the work they do, but Org3 even mentioned that they have become more data driven as a result of the pandemic. This overarching drive for data coincides with digital sensing as mentioned by Ellström et al. (2021), and as more data is collected, even further technological development to digitally scout, scenario plan, and mindset craft is feasible through technologies such as Big Data, IoT, and AI (Warner and Wäger, 2019). Org3 displayed a tangible benefit that comes with having a data backbone in place in their ability to quickly sense and adjust their data analytics practices; Org3 could, during the pandemic, ramp up their supply and operations planning from once a month to once a week as a response to supply chain disruptions in order to have more frequent and updated information regarding their afflicted lead times. These digital initiatives mentioned among respondents show the importance of building a digital foundation, or as Warner and Wäger (2019), Ellström et al. (2021), and Kane, Palmer & Philips (2017) refer to it, digital maturity; something that R5 especially agreed with and implied their organization had given thought and effort to.

5.3 Use of Technology

As mentioned in chapter Digital Business Model Change (2.1.4) by Matt, Hess and Benlian, (2015) *use of technology* refers to an organization's ability to exploit new technology. However, as previously explained, use of technology in this study was limited to technologies adopted as a result of Covid-19, in which some new significant insights were given. Firstly, a common theme that arose from the empirical findings was the move towards hybrid work

environments where organizations were forced to implement virtual meeting software's such as Microsoft Teams and Zoom. Although the move was forced, the majority of respondents placed emphasis on the importance of these technologies, and that they will continue working according to the hybrid model in the future. R2 specifically mentions that work has become more digital in nature, and that with the changes in work-life balance, had the organization tried to revert back to pre-Covid-19, a lot of people would jump ship. Org3 began using factory digital twins and augmented reality to enable remote factory visits and inspections. Org4 had high digital maturity pre-Covid-19 and did not need to implement any substantial systems to facilitate remote work. Org5 found the use of remote connection solutions that enabled digital monitoring and revamped their entire marketing strategy to cater to modern digital channels. Org6, like Org1 and Org2, have adopted digital tools like Microsoft Teams and Zoom, and will continue to incorporate them into their working culture. Org6 posits that these tools have permeated their working culture at a faster rate than if Covid-19 had not occurred, but R6 does not believe that remote work will come to fully replace work in office post-Covid-19.

Given this insight and comparing it with current IS literature, it is obvious that not enough emphasis is placed on analysing hybrid work environments in the literature. While that could be due to the novelty of the phenomenon, this study has proved that the use of virtual meeting software has not only enabled collaboration during Covid-19, but that it is also a realistic and valid approach organizations continuously will adopt after the pandemic as well. However, in this sense it is important to highlight that the hybrid model is not optimal for all types of businesses, but rather that it could act as a legitimate approach for organizations in the future. Furthermore, the empirical findings proposed that the role of technology can come to be excessively unfounded, or rather misconceived in terms of its role in driving digital transformation. This was implied both by R5 and R6 who argued that people tend to jump to technology before fully understanding current problems and challenges. This could in turn be equated to Matt, Hess and Benlian (2015) and Hess et al., (2016) who stated that merely investing in technology does not always guarantee success. Hence the key aspect here would therefore opt towards looking at specific cases before deciding upon which technologies to use as well as placing more emphasis on the people involved and less on the technology. Another implication suggested in the literature is Yoo, Henfridsson and Lyytinen's, (2010) notion of platformization of products to services, with Apple's iPad being enhanced by the App Store as a prime example. However, as opposed to the literature, the empirical findings showed little implications as to how this phenomenon was applied in practice among the respondents, eventually leading to the conclusion that platformization of products is only one rather niched way of using technologies to appropriate value within organizations.

5.4 Digital Seizing

As stated by Warner and Wäger (2019), Schoemaker, Heaton and Teece (2018) and Ellström et al. (2021), a common theme in the literature regarding dynamic capabilities refer to the notion that business model innovation is a central aspect in seizing opportunities. With this in mind, this chapter, Digital Seizing (5.4), will dive into the differences and similarities in the ways that organizations have managed to capitalize on opportunities they have sensed as a result of Covid-19. The subsequent aspects of business model innovation that have occurred as a result of the seizing discussed in this chapter, will be further developed in chapter Digital Business Model Change (5.5).

As mentioned in Digital Sensing (5.2), Org1 adapted to legislative pressures and found that their compliant solution had uses in both PFM and in their EU operation's need to conform to PSD2. In essence, Org1 sensed the threat that fostered their PBL solution to, as Yeow, Soh & Hansen, (2018) put it, decide upon changes to make across multiple components to capture sensed opportunities. Org2 sensed the demand for their AGM solution in response to Covid-19, in contrast with the example of Kodak (Schoemaker, Heaton & Teece, 2018), who succeeded in sensing market trends, but failed to structure their resources to leverage their position and seize the opportunity that an external event presented. Org3 had already laid a foundation of digital maturity pre Covid-19, through working with automation and their supply chain. This enabled Org3 to think on their feet to further combat measures of social distancing with technology such as factory digital twins and augmented reality, and supply chain disruptions with technology such as 3D printing. Alongside these technologies, Org3 also leveraged their data backbone by empowering their operators from a bottom-up data driven perspective with their connected worker initiative, which as a result facilitated operator upskilling, which is an aspect that will be covered later in Structural Change (5.5.2). As a digitally mature company that had since a few years back started to foster a data driven mindset, Org4 had a pre-Covid-19 standing organizational culture of utilizing external resources in the form of master students in data science/AI and internal resources in the form of internal hackathons to facilitate automation. Similar to Org2, Org5 used their vision and understanding of market demands to capitalize on digital solutions within factory settings, that cater to remote control and resource planning of factory processes, as a result of Covid-19. Org6 did not provide any concrete examples within their own company but mentioned that in their experience of working in a consulting manner with other firms orchestrating DT during the pandemic, organizations that capitalized on the dynamic environment were the ones who could pivot in response to demand. This goes hand in hand with the notion and importance of strategic organizational agility and flexibility that Ellström et al. (2021) and Warner and Wäger (2019) states to be of importance within one's business models when seizing upon sensed opportunities. This aspect of organizational agility is one of the key findings this research has found to be of relevance regarding the way organizations have maneuvered the pandemic. Organizational agility and its constituent parts will be discussed further in the coming chapter Digital Business Model Change (5.5).

5.5 Digital Business Model Change

5.5.1 Financial Aspects

As argued in the literature review by Matt, Hess and Benlian (2015), all DT efforts are dependent on one congruent factor, namely, the financials. Which implies that if the financial aspects are not considered, firms have a smaller chance of succeeding with DT. However, when glancing at the empirical findings, this did not seem to correspond with the conclusions stated in the literature. Instead, the results from the interviews pointed towards the financial aspects being considered as a less important aspect in comparison with the other two factors, *structural change,* and *changes in value creation*. This revelation was a result of respondents pointing to the fact that big, incumbent firms rarely come across economic difficulties since they, as mentioned earlier, can either borrow money from banks or other market actors rather easily when put under pressure. This fact, however, would only apply for incumbent firms, since other types of organizations such as start-ups or SMEs may have a harder time acquiring

economic resources in the same way incumbent firms can, thus the generalizability of this conclusion is limited. Still, given the empirical findings in comparison to extant literature, it is fair to say that there are some distinctive differences as to how important the financial aspects actually are considered with regards to DT. Matt, Hess and Benlian (2015) went on to state that the financial constraints can be seen both as a driving force and a limitation in terms of making changes to an organizations' core business. Nevertheless, as evident from the empirical findings, there are other perspectives to be added rather than just viewing it as two separate outcomes, such as the organizational size and relationship with other actors in the market. In this sense, the financial aspect is also viewed as an enabler for establishing relationships between different organizations which is a perspective that adds value to existing research within this domain.

5.5.2 Structural Change

With previous research pointing towards structural changes being a central aspect in business model change, some findings can be brought to attention to support this. As stated by Verhoef et al. (2021), organizational structure plays a central role in firm's ability to adapt to change. In particular, Verhoef et al. (2021) points towards flexibility as an enabling force for successful transformation. When compared to empirical findings, it is thus appropriate to suggest that there is a growing consensus in terms of the importance of flexibility, both internally and externally. Hence, in accordance with Verhoef et al. (2021), R2 stated that a key task when adapting to Covid-19 was to have a flexible structure within the firm so that resources, processes, and setups were easily interchangeable. Similarly, R6 argued that those parts of Org6 who had flexible structures were the ones able to pivot and capitalize from Covid-19, further confirming Verhoef et al. (2021) conclusion regarding organizational structure. Given these findings, it would be relevant to argue that implications of practice are aligned with the conclusions in the literature. Going one step further into this thought, Verhoef et al. (2021) argue that agile organizational forms facilitate the use of agile work methodologies within organizations, implying that firms who acquire flexible forms have a greater chance to respond to constant digital change. This is aligned with R1 who argued that the single most important structural change Org1 implemented to create a competitive advantage was to start working with agile methodologies. Moreover, the majority of the empirical findings pointed towards agile methodologies being a key aspect in their working environment, adding to Vial's (2019) interpretation of agility (Warner & Wäger, 2019) and ambidexterity in rapidly changing environments. To strengthen this in our study, agility has been included in the findings table (Table 4.1), both as a result of the respondents pointing towards its significance, but also with support from extant literature.

Another common theme revealed during the interviews was the focus on upskilling internal competencies as a result of Covid-19. Both R3 and R5 argued strongly for the importance of developing internal competencies rather than looking for external resources, especially during the pandemic where outsourcing became more challenging as a result of restrictions and lockdowns. Like previous respondents, R1 mentioned that Org1 had, as a result of Covid-19, started to move much of their outsourcing in-house, as a response to the call for competence that Org1's move to cloud solutions had created. Although referred to in the literature as developing internal competencies (Verhoef et al. 2021; Matt, Hess & Benlian, 2015), researchers have failed to point to the specific aspect of upskilling, leading to it being one of the most important findings of our study. For instance, as described in chapter *structural change* (4.5.2), Org5 implemented courses in which both customers and internal competencies were

offered training to, among other things, increase the digital maturity within Org5. Similarly, Org3 provided all operators with iPads which allowed them to share data regarding how different machines were checked, maintained, and operated, and thereby facilitating internal upskilling. Consequently, while the specific efficacy and efficiency of upskilling internal competencies remain uncertain, the trend in our empirical findings showed that it will likely increase rather than decrease over time. Lastly, the majority of the respondents proposed that cross border collaboration has been enabled through Covid-19, such as in the example of Org3 whose augmented reality solution allowed for managers from all over the world to *visit* factories abroad. Respectively, as shown in the example from R2, Org2 managed to enhance the collaboration between different offices around the world as a result of employees being forced to adopt digital tools to maintain communication. Accordingly, comparing this with Vial (2019) who suggested that cross functional teams will be required to bridge the gap between organizational and IS strategy, and Warner and Wäger (2019) who stated that improved internal digital networks can unite global workforces, it could thus be argued that this specific implication of theory is aligned with practice, with the exception of the aspect of upskilling which has so far not seen much attention.

5.5.3 Changes in Value Creation

As for *changes in value creation,* the study displayed numerous examples of how firms' created value before and after the pandemic, one of them being the PFM solution, in which Org1 managed to create a new customer channel through the use of technology. This goes in line with Vial's (2019) narrative regarding the expansion of existing customer channels through the use of digital technologies, where he states that an omnichannel strategy can help appropriate value both for customers and the service provider. Another example originated from the empirical findings was the move towards a more data driven mindset. R3, explained that Covid-19 forced them to move towards using more data to make decisions. At the same time, R4 explained that their data driven mindset existed before Covid-19, but that the pandemic functioned as a push to incorporate the mindset across the entire organization. Hence, while not completely revolutionary, the finding still complements existing research. Moreover, as stated in the literature by Verhoef et al. (2021) digital technologies can help companies in reshaping their value networks and digital channels through the use of social media or IoT devices. Placing this statement in the context of our empirical findings, it is evident that there are some implications as to how organizations could reconfigure their value networks by using social media. For instance, R5 argued that marketing their solutions became difficult during Covid-19, since Org5's usual means of attracting new customers from large conferences, but having conferences cancelled due to the pandemic, forced Org5 to seek new ways of digital marketing. These new digital channels refer to Org5's use of social media such as LinkedIn to find and attract new customers. Accordingly, while the specific case of Org5 can be considered forced or necessary, the organization nonetheless managed to develop new value networks to appropriate more value for both themselves and the customers. With this example, it would be legitimate to argue that Covid-19 did not only create new digital channels, but also opened up for new ways of marketing in which internal value could be facilitated.

5.6 Digital Transforming

Steininger et al. (2022) argue that the aspect of transformation in DC refers to the organizational capacity to change based on sensed and seized opportunities. A broad statement regarding a digital transformation that can be applied in the case of all respondents sees to the placement of hybrid work in the organizational culture going forward post-Covid-19. Yet another generalization refers to the empowering impact that organizational agility has provided organizations with in facing the forces of the pandemic. Org1 places their work with agile methodologies as one of the principal factors in their transformation efforts during Covid-19. Org2, Org3, Org4 and Org5 have also stated that their work with agile methodologies pre-Covid-19, or their switch to agile methodologies during Covid-19, has been a key factor in helping the organization navigate the pandemic's dynamic environments. One key insight regarding the will to incorporate and use agile methods that respondents have mentioned, refers to the need to be able to match the demands of customers and clients faster than pre-Covid-19, and to be able to prototype solutions on a whim. R6 frames the concept of organizational agility as being able to embrace ambiguity, as the pandemic, in essence, was really about ambiguity. This follows the tone that Ellström et al. (2021) set in saying that maintaining competitiveness is not about constantly making changes in business models or internal processes for the sake of it, but to do it in adaptation to one's capabilities in sensing and seizing the environment. Which gets harder the more dynamic or ambiguous the environment is, but nonetheless, we posit that agility is one key factor in maintaining organizational buoyancy and achieving fruitful endeavours.

Digital transformation as an organizational phenomenon, has from the onset of this study and within the context of this research, referred to the organizational transformation of business models through the use of digital technology, to create and appropriate more value for a firm (Verhoef et al. 2021; Vial, 2019; Soto-Acosta, 2020). The underlying definition that this perspective of concept rests on has been challenged, or at the least embellished, by the study's respondents. Exactly how this has occurred is discussed in the next section, DT Definition Qualms (5.7).

5.7 DT Definition Qualms

This study's definition of DT has approached the term from an organizational rather than societal perspective, this was done in adjunction with Markus and Rowe's (2021) interpretation of the acclaimed definition of DT by Vial (2019, p.121) that has taken DT and framed it in an indiscernible distance from the term *digitalization*. This is problematic as it makes distinguishing the two closely related terms difficult for an academic, even more so perhaps for a practitioner. But for a practitioner, the exact framing of these terms is not as important as making sure that the work that they represent gets done. This study's definition of DT is absorbed from Verhoef et al. (2021, p.889), and it refers to DT as a "*change in how a firm employs digital technologies, to develop a new digital business model that helps to create and appropriate more value for the firm".*

The exact difference between what can be defined as ITOT and DT is in the current literature convoluted and open to interpretation, but as Wessel et al. (2021) states, ITOT strengthens the existing organizational identity and value proposition through the addition of digital technologies, whereas DT incurs a shift in organizational identity. However, Soto-Acosta (2020)

proclaims that while DT requires an alteration of a firm's business model, it does not require total upheaval, instead it can be reformed to include or revolve around new digital technologies.

What can be said about the scholarly discussion of DT's definition is undecided as the concept is constantly changing with new publications, but what is clear from talking with respondents working with the practical nature of DT, is that the definition we provided was well received but needed slight alterations to suit specific organizational contexts. Such as with R2 who pointed toward the need for a specification of scale in the definition, as to aid in deciding what one can regard as digital transformation or not. R2 further mentioned the term digitization and provided two examples from their firm; *digitization* is however a different term (Yoo et al. 2010), of a lower granularity than both digitalization and DT (Warner & Wäger, 2019) and is one among many commonly conflated concepts within the realm of DT among scholars (Vial, 2019) and practitioners. However, this semantic disarray within the constituent concepts of DT is perhaps more driven, and enjoyed, among scholars as there are numerous scholarly debates of definition to point toward that display similar tendencies (Vial, 2019, Markus and Rowe, 2021). R3 did not really agree with the fact that DT has too much to do with developing new business models; instead positing that it has to do with supporting the current business with digitalization. R4 thought the aspect of creating value should be more emphasized, as creating value in an organizational context has just as much to do with creating value for one's colleagues as it does for one's customers. Furthermore, R4 mentioned that DT has to always put the people first in mind. R5's beliefs are strongly in line with R4's latter statement in stating that DT is not about technology at all, DT is about the people, business models, and value chains. R6 thought that DT is contextual and refers to reshaping business models at times and improving business inefficiencies in others. As a concluding remark R6 states that in a lot of contexts, people jump to technology before they think and understand about what the problem or user need is.

What this juxtaposed stream of academic vs practical thought presents is that there is an apparent disparity in consensus regarding a generally accepted definition for DT. This does however imply that the field of DT is rife with life and that DT, as a discipline, is conceptually growing, something that cannot be said in the same capacity for the field of ITOT. The basis for this semantic discussion lies in our will as researchers to further the conceptual understanding of DT, but as previously shown, that in itself is a multifaceted and complex endeavour. To sharpen the blur, we have taken the lens of dynamic capabilities to magnify the fuzzy nature that DT presents, both in academia and practice. We have also applied the concept of Covid-19 to see what pressure the pandemic has induced. Overall, what has been shown is that DT is ultimately ill-defined and will likely continue to be so for as long as it, as a field, has researchable value. We do however propose that further work with the definition and conceptual boundaries of DT caters to, in an increased capacity than the field so forth finds itself in, to:

1. The boundaries in *scale* of what can be defined as *digital transformation*. For example, to be classified as DT, where are the boundaries in scope set that a DT should encompass?

2. The scope of *reform* of *digital business models*. For example, should a DT require a new digital business model in its entirety, or can a digital business model reform suffice?

3. The forms of *creating* and *appropriating value*. For example, is a DT valid per definition if the value that is created is explicitly for society at large, rather than for the usual case of it being created for the organization's stakeholders?

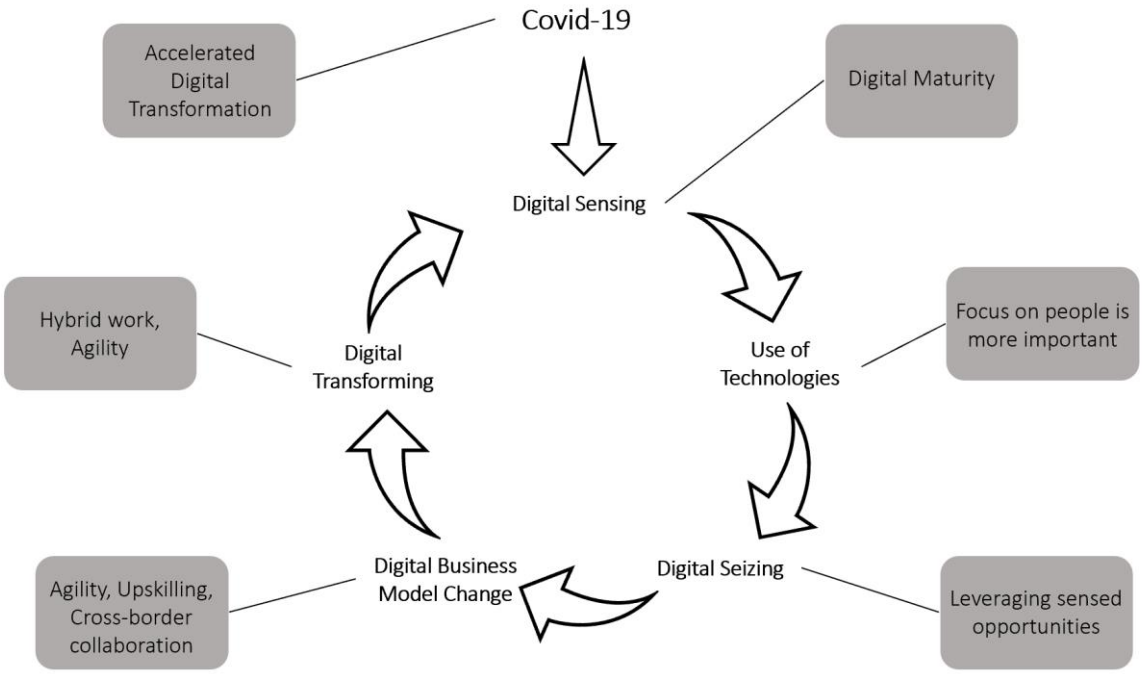

Figure 5.1: Summary of key discussion points

The model above summarizes the key discussion points from the report as compared to the conceptual model (Figure 2.3). By displaying the most important aspects given through the empirical findings, Figure 5.1 aims to visualize our contribution to current literature in which some factors already are mentioned, such as the acceleration of DT, while others are not emphasized enough, such as upskilling internal competencies and the importance of digital maturity. Accordingly, Figure 5.1 is not to be seen as a proposal for a new framework, instead, it should act as a contribution to already established notions in extant literature.

6 Conclusion

This study set out to investigate the impact Covid-19 has had on enabling dynamic capabilities for companies to digitally transform by aiming to answer the following research questions:

- *How has Covid-19 driven dynamic capabilities for companies to digitally transform?*
- *Has the definition of Digital Transformation come to change as a result of Covid-19?*

Given this research question in correlation with the empirical findings, the study came to some key findings that are presented below. In light of previous research, a new dimension presented in this study was the result of *upskilling internal competencies* within organizations to be able to respond to dynamic environments. This was not only lacking in extant literature, but also proved to be one of the core tasks organizations perform in order to respond to changes in a dynamic environment. In addition to this, finding the right competencies was established as both an effective and fundamental task in response to the rapidly changing environment.

The *use of technology* proved to be unfounded in terms of its role in driving digital transformation. Instead, the study concludes that people, not technology, are the driving forces behind digital transformation. At the same time our study demonstrated that the use of technology has enabled cross-border collaboration, thus we argue that hybrid work environments is an efficient approach for organizations in the future. Our results further indicate that the financial aspects often referred to in the literature as substantial, plays a significantly smaller role than described for incumbent firms, and thereby posits that current literature on digital transformation is not generalizable to all types of organizations.

With this study we have also shown that incumbent organizations who express the quality of *digital maturity* have had an easier time navigating the dynamic environment that Covid-19 has brought about. Through our study we have enriched the conceptual understanding of digital maturity and its relation to DT through peering at incumbent firms facing and transforming in dynamic environments. We contribute that digital maturity is expressed in the organizational ability to digitally sense dynamic capabilities through the benefit of a solid technological foundation, and an organizational culture that supports it. A solid technological foundation refers to the use of digital technology within the organization that successfully supports the organization's digital business model and the organization in delivering their value proposition. A solid supporting organizational culture refers to a highly agile organization that finds it easy to adapt one's use of digital technology within one's digital business model when the environment calls for it.

As for the definition of DT and how it has come to change as a result of Covid-19, the study found that the definition *has not* changed as a direct result of the pandemic. This conclusion arose from the empirical findings which posed that the suggested definition of DT was valid but needed slight modifications to suit the specific organizational contexts. Decisively, while not directly affected by Covid-19, this study argues for more research to be conducted on the definition of DT and its conceptual boundaries to eliminate any type of ambiguity within the concept. To summarize, this study concludes that Covid-19 has driven dynamic capabilities for companies to digitally transform through internal upskilling, increased digital maturity,

and cross-border collaboration. Finally, the results strengthen the already established argument that Covid-19 has accelerated digital transformation efforts within companies.

6.1 Future Research

As DT proliferated during Covid-19 and organizations moved toward digital technologies to facilitate their way of working, have security and privacy concerns taken the necessary steps to keep up with the rapid digital transformation of work processes and business models? Our findings suggest that there are considerable doubts to think that this is the case. With this we suggest further research into the aspects of organizational information security as a result of the pandemic. As for the transferability or generalizability of the study, the empirical findings in correlation with extant literature act a as a foundation for further research in which a broader perspective on crisis can be taken. On top of this, this study has focused on incumbent firms, hence, studies of a similar nature could pertain to the same topic but with a focus on SMEs to ascertain if our findings also correlate to organizations of a smaller scale.

While this study chose to focus on Covid-19, other crises like war, or environmental crises can come to provide the current field of study with new perspectives. Finally, since crises as such are often inevitable, more studies need to be conducted to help organizations manage the implications of dynamic environments, as an organization's wellbeing affects the livelihoods of its people.

Appendix 1: Respondent 1

Speaker	Transcribed Text	Code
1. Jens	So let's carry on to the first real question then, and we would like to ask you if you could please tell us a bit about yourself and also your professional career?	
2. Respondent 1	Yeah, okay, I currently work as a solution architect and technical lead for online payments at Org1. In a unit called Business tech, it's a combination of tech and business development. Basically. I have a long, long career in the IT industry I think I, I examined in * and started to work as a developer at *. And now 40 years later, I'm at Org1, I think I've been at Org1 now for six and a half years. And I started on the store side as payment architect or solution architect and then I was an area architect for payments for a while and then I moved over to online. And now I'm I'm not working on on store solutions for the moment, mostly online stuff	
3. Jens	Okay great, thank you for the introduction, I or rather we, would like to ask you a few questions about Covid-19 and how it has impacted your organization or rather first and foremost, has it impacted your organization?	
4. Respondent 1	Oh, yes, in many, many ways, I think. And, and, and, I mean, when, when the pandemic was, at its peak, so to speak, I mean, we had to close down stores and people started to work from home and, and, you know, customer service agents moved out of the call centers and started to work from home. So it had a huge impact, I think in in many ways	COI
5. Jens	Yeah it seems like it had a large impact. Did you view or as an organization, did you see Covid-19 as more of a threat or more of an opportunity from a business perspective?	
6. Respondent 1	Well, in a way, I think it's both, I think, really, because it's a threat because you lose revenue, of course, when you have to close down stores, and even if some of the business move over to the online channel, it will not cover, you know, the loss from closing down the store channel So, in that respect, I think it's a threat, but then then we are kind of forced into new ways of working and and a lot of stuff we had on on the pipeline for for developing, so to speak, that that was the speed of development was rapidly increasing because of this and with that comes an opportunity as well I think to work in in a more lean and clever way and and also becoming more more digital, you know, in the contact with our customers so so I would say it's both threat and an opportunity.	COI, DSE

7. Jens	Yeah, yeah that seems good. So in a related question, how would you, sort of, categorize the effects that Covid-19 has had on your business?	
8. Respondent 1	I think it has it has speeded up the the transformation into becoming a more digital company, so to speak, because I mean, during the pandemic, a lot of business moved over to the online channel and then when we open up the stores again, it, the change you know, in the move to the online channel, kind of, it was sticky, you know, people continued to buy online and that made us more, more moving in an Omni direction so to speak, because we going from, you know, an IT department and business department and so on, into a more agile setup. And even if we had started on that before the pandemic, I would say the pandemic speeded that transformation up a lot as well.	
9. Alexander	Just as a little follow up question there, Respondent 1. Do you think that you were prepared digitally speaking for, for the crisis and for COVID-19? Could you reconfigure your businesses or processes quickly? Do you think? Or was it kind of a long working process?	
10. Respondent 1	No, I think as we had already started the Agile transformation and we also had something we call the flexible work life which means that you don't have to be in the office and work nine to five every day, you can work from home, so we had all these tools you know, already in place but but we discovered you know, when everyone started to work from home and sometimes you need a VPN connection when when you need to access certain systems and that kind of things was not the dimension you know, for everyone working from home. So, but with a little bit of tweaking here and there, I think we adapted really quick and that was probably because we had started already. So it actually helped us to speed up the transformation I think yeah.	DZ
11. Jens	Oh ok great, i think with that we can conclude the covid section of the questionnaire and instead move on to the next section which has to do with digital transformation. I'd like to read to you our definition we've chosen for the study, and it goes like this, so, we define digital transformation as a change in how a firm employs digital technologies, to develop a new digital business model that helps to create and appropriate more value for the firm. Do you agree with this definition or do you have any other perspective on it?	
12. Respondent 1	No, I agree, that sounds logical to me.	DT-DEF
13. Jens	Ok, then i'd like to ask you if you have any digital transformation efforts going on currently at your company?	
14. Respondent 1	Yeah, we have a lot of activities going on, in different areas. But one, one example I can mention that is kind of interesting. And something I've been working on myself is that in	DSE, UOT, DZ,

	the US, for example, we have a huge customer service department, and they used to sit in, in call centers and work and and when the pandemic hit us, they couldn't do that anymore, they had to move home and work from home instead. And that made a part of what they do difficult. Because in US, it's quite common for people to call in to the customer services department, and ask for help to put an order through. I'm not sure if they are lazy, or if they don't understand how the website is working but its, probably a combination. But but at the end of that process, you know, the customer service rep was asking the customer for the card details. And it's a lot of regulation around current payments. It's called the Payment Card Industry Data Security Standard and and working from home is not regarded as a safe environment. So we couldn't allow that anymore. So we had to close that service down. And I mean from from the business perspective, they said that they take orders for a value of around * Swedish kronor each year on on this. So we started to look into an alternative because it wasn't good enough to just close it down. We lost money and we got unhappy customers that couldn't do as they they were used to do anymore. So we developed something we called PBL. And, and then the customer service rep when they come to the payment stage. They just click the PBL service and then they get the link back and then they can copy that link and send it to the customer via email or WhatsApp or whatever. And when the customer click that link, they will land on a secure page where they can perform the payment and then the payment will be notified back to the order management system and and then the order will be paid. And that can be sent to the warehouse for picking and packing and sent out to the customer. And so I think that's kind of an example, that that actually made us work a little bit smarter and safer because of the pandemic. Yeah.	DBMC-CVC
15. Jens	Oh that's interesting, so as a follow up question for this, is this an example of a digital transformation project that you will continue to develop or use?	
16. Respondent 1	Yeah, no, no, we will definitely keep that one. And we are continuing work on that new payment functionality as well. And we're currently working on something we call PFM, because it's a lot of young people that don't have their, their own credit cards, but they still can be members of Org1 and they can, you know, set up their baskets, but then they have to ask their parents or grandparents or someone to pay for them. And it's a bit complicated, but now, we will add the function where they, they can select the payer, so to speak, and then the payer will be sent the link and then they can pay for it, and then the basket will be checked out. So the marketing people is very excited about this, because now	UOT, DZ, DBMC-CVC

	they can reach, you know, a new young target group, which they are very interested in, especially young girls. So, so we continue to build on this actually, and building new functionality. And it's definitely something we will keep, and especially in in Europe, where it's a requirement on multi factor authentication on card payments. So this couldn't be handled from from the customer services, the call centers anyway in Europe, but now we can open up this kind of new service to the customers as well.	
17. Jens	Great examples, it almost seems like Covid-19 pushed this transformation that Org1 had already sat in motion in a sense, maybe more than it would have progressed had the pandemic not occurred.	
18. Respondent 1	Yeah.	
19. Jens	So are there any other examples you can think of?	
20. Respondent 1	Yeah, I mean, in general, I think it has speeded speeded up, you know, the, the Omni transformation going from, you know, one channel selling in stores, and then another channel selling in, in the, in the online channel, because the customers, they move a lot between the channels now, so we have speeded up the development on functionality, like, what do we call it Oris *online returns in store*, so if you buy something online, you might prefer to instead of sending it back to us, you can go to your nearest store and hand it in instead. And that's, that adds convenience for the customer but it's also good for us because we drag the customer into a store and when they do that return process, they very often tend to buy something else at the same time and so it's a lot of Omni activities going on, like like Oris as an example and also on the on the online site. You can see in which store can I find this garment and roughly I don't think that number is 100% exact but that you can also see the stock levels and stuff in that store. So yeah, it's a lot of Omni activities going on. And that I think is very much driven by the pandemic as well. But we were working on it before as well but it has been speeded up.	COI, DBMC-CVC
21. Jens	Ok awesome, so sorry i just need to ask, what did you say, oris? What did that stand for again?	
22. Respondent 1	Yeah, it stands for on line returns in store.	
23. Jens	Oh ok that makes sense.	
24. Respondent 1	Yeah, yeah.	
25. Jens	So, then I, or we'd like to move on to the next section of our interview guide, in which we get into our third concept we're dealing with. This has to do with a theory from strategic management called Dynamic Capabilities, is that something you have heard of maybe?	
26. Respondent 1	Not sure if I have heard about it.	
27. Jens	Ok, let me read you the definition we have chosen for our study.	

28. Respondent 1	Yeah, Yeah, definitely.	
29. Jens	Ok so for our study we have decided on a definition that goes like “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments”. Is this something you work with actively within your company?	
30. Respondent 1	I think what comes to my mind here is, it's more kind of, we need to do a technical transformation, so to speak. So, and this, we also had started before the pandemic kicked in. And I mean, it's all about moving from our own data centers to the cloud, really. And this is very tightly linked to the Agile transformation as well, where we, instead of having, you know, divisions, and sections, and departments, and so on, we just have product teams gathered in, in different product areas. So payment is one, for example, checkout is another one, customer attraction is another one, and so on. And it's all under a domain called the customer. So I mean, it's both an organizational change, I think, going over to Agile, and then it's a technological change, you know, instead of working on a huge monolith, where, you know, hundreds of different teams is working on different parts of the code in the platform. And then it all has to be released at the same time, moving over to the cloud, and splitting it all up in micro services, where every team has their own, you know, DevOps engineers, and everything is, you know, it's infrastructure as code. So if we wanted to, we could deploy new code 10 times every day, or once every day. And now we can only release code once, once a month, really. So it's a big tech transformation, in combination with an organizational transformation, I think and that is needed for, for dynamic and for speed. So we are moving everything now into the Azure Microsoft Cloud. And we are closing down our own data centers, so they aren't going to be of any any use anymore. And that brings, of course, the need for a lot of new competence, as well. So we are hiring a lot of new engineers and DevOps engineers and so on. So, a lot of things. We had outsourced that big consultancy companies like * earlier is moving more in house. No, I wouldn't say that, that it's not happening overnight, of course, but instead of moving stuff out of the house, we are taking stuff back into the house again. And that's because the cloud transformation make things much, much easier to work with. Compared to when we had our own data centers with, you know, servers and, and, our own networks for everything. So, yeah, that helps it.	DBMC-SC
30. Alexander	Was that something that changed? I didn't know I don't know if you said this already. But was that something that changed during COVID or before COVID? Or was that like a process that you already had planned to do?	

31. Respondent 1	Yeah, yeah, I think we had started on it. But again, I think the pandemic speeded up the transformation so we had to do it faster because we couldn't sit, sit still and wait so to speak. We needed this new much more dynamic environment to be able to work faster yeah.	COI
32. Alexander	Great.	
33. Respondent 1	Okay.	
34. Respondent 1	Sorry I think you went on mute there Jens	
35. Jens	Oh dear, can you hear me now?	
36. Respondent 1	Yeah. Yeah, that's fine.	
37. Jens	Ok, so as I was trying to say, have you found yourself utilizing a lot of external competencies, like company * as you mentioned earlier, to manage Covid-19, or has it mainly been internal competencies?	
38. Respondent 1	Well, I think you know, if we start from the top there and drill down a little bit. We do work a lot with, you know, type management consulting companies like * and * and so on. And they help us to kind of evaluate, you know, you should be over here somewhere now, but you are here and you need to work faster, you need to do this and that. So, I mean, we tried to bring in external competencies and, and help us understand where we are, you know, with, with our transformations and, and then internally, we have a lot of different tools, like, you know, we have tools where you can set up what do you say? *bevakning*, surveillance, so to speak on what's written in media, and so on. And, and then we have a lot of intelligence coming in. So we know, for example, that marketplaces is growing much faster than, than single site destinations. So and then, and then usually, we start small, you know, testing a little bit. So now you can buy * on Org1 dot com, for example. So we're trying to bring in a little bit of new new brands into the mix on the Org1 dot com site, which is, by far the biggest even if we have other brands as well, like *, *, *, *, and so on. But so when we see these trends that we think is going to change the online space over time, we, instead of trying to, to eat the whole elephant in one piece, we we started testing small scale, and then we iterate on it. And if it's going well, we can take another step, if it's not going well, we can take step backwards and try in another direction, so to speak. And then we also tried to do involve AI, artificial intelligence, as much as possible to be, you know, all decisions should be as data driven as possible. And AI is a really, really good technology for that. So we have a, that's an own domain, so to speak, if I belong to the customer, domain, AI, and data, and analytics is another one. And we do a lot of kind of, using kind of predictive analytics in a smart way already. Even if I don't think we are fully fully data driven yet, but we are moving moving in that direction. And I can, I can	DSE, UOT, DZ

	give you an example of how we use predictive analytics. And when when we do sales, for example, sell outs, when we get on to get rid of goods, we need to reduce the pricing. And that used to be merchandisers doing that manually. So they looked at what do we have too much in stock of for the moment. And how much should be reduced the price to get rid of it as soon as possible. But you know, it's so many products and it's so complicated to get the full picture of this for a human being, or a merchandiser, so there we started with an AI engine to look into that instead. And the AI engine could immediately of course, understand the sales history and what we had in stock and everything. And then we did AB testing on that we let the AI do some some price reductions on its own and then we had merchandisers doing some of its own and then we did combinations you know where AI work together with the merchandise service. And we came up with the best solution was AI in combination with the merchandiser so and we saved so much money on this because the trend for merchandisers was to reduce the prices too much. We didn't have to almost give it the way to get rid of it, so to speak. And the AI has helped us a lot on on that. So that I think is kind of an enabling technology as well even if it might not be directly related to to the pandemic. Yeah, really. It's something we was working on earlier as well.	
39. Jens	That's pretty spot on what we were looking for as, because, dynamic capabilities has an aspect known as sensing, that has to do with spotting opportunities and threats to help navigate dynamic environments. And as you mentioned, you use AI as a technology to help you do this, but to piggyback off this, did covid impact the way you used these technologies at all?	
40. Respondent 1	So well, I think it's, it's more, I don't think it's so much pandemic related. It's something we did anyway. And, and it's a growing usage of, of technology, in all areas so to speak. It might be that, you know, we, the online channel has been growing so much during the pandemic, so we had to work get more clever with the warehouses, for example. And so one, one warehouse, um, normally, a warehouse only served a store channel and another warehouse served the online channel and that had to change, you know, we had to use our warehouses in a more clever way. So we built, um, what do we call them? Orchestration solutions on top of the warehouses and the warehouse management systems, and then we could switch orders around, you know, wherever we had the goods in stock. So I think, in a way it has speeded up the development because of the rapid growth in the online channel.	

41. Jens	Great insight, so um, let me see where we are in the interview guide, Alexander, do you have any question on your mind or what do you think, have we covered these questions enough?	
42. Alexander	Yeah, yeah, I think we have covered those. I'm thinking like, the question was, which technologies did you use to capitalize on the aforementioned opportunities and deflect potential potential threats to manage dynamic environments, but you talked a bit about, like, the way you capitalize the example from USA, that was a really good example of where you kind of seized the opportunity that COVID enabled. It enabled you to actually move to a digital sort of customer service. And you're going to keep this function after the pandemic. So yeah, I think you answer those questions already.	
43. Jens	Okay, so maybe we should move on to these questions that i'm highlighting?	
44. Alexander	Yep, yep.	
45. Jens	In that case I'd like to ask you about how, or rather let's say, which technologies or techniques do you use to transform your internal and external resources to respond to dynamic environments?	
46. Respondent 1	Yeah, I think it's mainly, you know, it's only one thing you can can be certain of, and that is change, change will will come, you know, and I think the pandemic, shook us a little bit to wake up, you know, that the world is, is changing, and, and I think that change is coming is going to come more rapidly, you know, because we almost recovered from the pandemic. And then Putin started invading Ukraine, you know, and we had to close down all operations in Russia, and we, we had to close down expansion into markets like Ukraine and so on. So and I think it's all about being agile, you know, the world is changing, and we don't know what happens. Next time, it will come as a surprise and then the only thing we can do is to be more agile, adaptive to change I think.	COI, DBMC-CVC, DBMC-SC,
47. Jens	Yes, ok so there has been some sort of shift in organizational structure with agility being, you know, um, being of importance. But that also makes me think about how, as a large global company, how has that been advantageous or disadvantageous during the pandemic in terms of being able to digitally transform, compared to say a small to medium sized company?	
48. Respondent 1	Yeah, I think that's an interesting question, I think and I mean, historically, we have been starting up our own kind of smaller brands to attract, you know, different target groups. Because if you're, if you're a small company, you can't really cater for the mainstream markets. And that's why we have the Org1 brand, which is one of the biggest	DBMC-FA

	retailing brands in the world today, and but then we have started, *,*,*, and so on to cater for different market segments. But, but again, I think a big organization is much more rigid, compared to a small start up organization. So that's the back side of the coin, I think, we, we can't move as fast as the smaller players can. But on the other side of the coin, it's also good to be big, you know, because you have a huge, you know, bargaining power when it comes to buying stuff, you know, from producers, but also when we bind services, like cloud services from Microsoft, and so on, because we will get much, much, much better pricing than the smaller startups, a friend, a friend of mine, here at Org1, he's leaving now and will start to work for a small, small startup company selling * products. So I asked him a little bit, he's going to be the development manager for that company. And I said, are they done with, you know, the, the cloud transformation yet, and they said, No, it's too expensive for small companies to move everything to the cloud. So some of the services will sit on the cloud, but some of the services will have to sit in the, in the own data center, because it's, I mean, it's not cheap to be in the cloud, it's lots of advantages, but if you don't have the bargaining power, it's quite expensive. So I think the big players is going going to be there, I don't think the startups will be able to take over the whole market, but definitely, definitely they will, will compete very successfully in certain segments, so to speak. But the advantages of being big is, it's really really strong advantages I think as well.	
49. Jens	Ok great, so it has its ups and downs in being such a, I guess, large organization as well. But that also makes me wonder, what, or how have factors such as organizational culture been impacted by the turbulent times that covid has brought about when you make digital transformations?	
50. Respondent 1	Yeah, I think I don't, I don't think it has changed the culture much. Because in Org1, it's it's a very long going company culture that at least I have found is very positive. And it's all based, you know, around seven key values. And these key values we work quite a lot with, you know, when we are team meetings and so on. So everyone understands them and knows them and, and its values like one team, you know, keep it simple, that kind of simple values that we tried to live after all the time and, and that I don't think has changed much really and that we want to keep intact. But then the organization is changing from you know, the, the old waterfall models to to an Agile Model and and that is very positive change, I think, because when when you worked in the old waterfall model, it was you know, Business needs to know, you only had the information to enough so you could do your work so to speak, and then you didn't	DBMC-SC

	have a clue about what they worked on in, in other silos. But in an agile organization it's, it's not so much about the documenting stuff and following the following the processes, it's more up to the teams, the self sufficient teams, you know, to do their work and then information is very accessible, it's very open. Because that's built into the Agile process, where you have, you know, Baker sessions and and you have a lot of sessions built into the Agile process, where we work in programming increments, which is six sprints and, and a sprint is two weeks then. And then the teams need to work out the interfaces between themselves, you know, and how to prioritize stuff against the objectives and key results that is coming from, from the management so to speak. Not sure if I answer the full question, or maybe I got lost on the way somewhere.	
51. Jens	No no, not to worry, I think you kept on track. But I'd also like to steer a question to, or try to ask you about how the, the financial aspect of your company was affected or not by covid, and if that influenced any digital transformation?	
52. Respondent 1	Yeah, okay. Well, I think, during the pandemic, the financial situation was quite hard for many, many companies for a while, because parts of the business had to close down. But again, there is an advantage with, you know, a big player, because we have lots and lots of money on the bank already. And if we need more, we can can easily borrow money. So that's an advantage from, from being big, so to speak. But otherwise, the I think this, the transformation is of utmost importance for the company. So it's from the chief executive, you know, all the way down, when we need to do this, you know, technical transformation, moving over to what we call the future commerce setup, and we need to do the organizational change. So I don't think we have any have had any financial constraints really on the transformation, because it's so highly prioritized from from top down in the company. And, and then I think we came out of the pandemic, quite good as well. But now we have problems in Russia with which was one of our, you know, kind of important growth markets. And now, we lost a bit of income over there, but I don't see I don't see financial consequences as a problem for the changes, so to speak. Really, we have the, the money we need.	DBMC-FA
53. Jens	Okay, yes, yes, I see what you mean. Um, to tie in to what you mentioned earlier about the PBL system or service you have initiated as a result of covid in the US, is that, um, or would you say that that has portability, or i suppose scaleability to transfer to other markets now post covid? What I mean to say, is, did this new way of creating value as a result of covid result in a new avenue for, uh, further business ventures?	

54. Respondent 1	Yeah. Yeah, yeah. Yeah, definitely. And I mean, the constraint here is more that you need a payment provider that can support this functionality, so to speak. And in this case, we are kind of lucky because we have a payment provider called * in US and in Europe, we use exactly the same payment provider so, and I think it will probably be even more useful in Europe because here we have multi factor authentication enforced by the payment service directive number two, so it's actually a law saying that you have to have this otherwise you cant take payments. In US they are a little bit slow on, on that kind of things but I think it will be enforced sooner or later in US as well so it would probably be a move we had to do anyway for you as well. But then it when it comes to Asia you know, and South America that those markets operate very very differently it's it's not so much card payments as we have in Europe and the US it's more like Ali pay is huge in China you know and that QR code based on the scan QR codes and people have money on their Ali pay accounts so we hardly don't take card payments in China anymore so very very different in Asia.	DBMC-CVC
55. Jens	Ok, great, that's some interesting points you mentioned. But, I think we are nearing the end at least in the prepared questions in our questionnaire. So, by that, I'd like to ask you if, if you thought of anything during the interview that we didn't ask that might be of interest to us and our study? If so, please.	
56. Respondent 1	Yeah, no, I don't think so. I think you have put some really really clever and good questions that are in an open way as well. So I hope I could respond to them so you can get some information out of it so to speak, relevant information I mean, yeah.	
57. Jens	Yeah no, definitely, I do think we got some great insights from this meeting today. Also, do you have any questions for us?	
58. Respondent 1	Yeah. And no, I don't think so. I'll just wish you good luck, then to finalize the master thesis and yeah, good luck with that.	
59. Jens	Ok great, well thank you so much for your time today, and, I guess we'll get in contact soon when we have the report more finalized. Other than that, good bye and have a nice day.	
60. Respondent 1	Yeah, you too. Thank you. Bye bye.	

Appendix 2: Respondent 2

Speaker	Transcribed Text	Code
1. Jens	I'm just gonna start recording on my end as well and then we can get started. Okay.	
2. Jens	Hi and welcome. This is the second interview with Respondent 2 from what was the company you worked at again?	
3. Respondent 2	Org2	
4. Jens	Org2. Okay, so could you tell us a bit about yourself and your professional career?	
5. Respondent 2	Yeah, absolutely. My name is Respondent 2. As you mentioned, I'm 27 years old. And I work as a product manager/product owner in a financial services company, based out of *. It's part of quite a big conglomerate that works across Europe. But my kind of business is primarily based out of * in *. As a product manager, I'm I'm the product owner of a department called Investor Services. So what we do is, we basically provide services to companies that allows them to manage their their shareholder base. So that can be anything from maintaining a shareholder register, which is a legal requirement that all companies basically have to keep a list of all the shareholders and investors that own stock in their company. And it can also be related to, for example, the the annual general meeting, which is another legal obligation that companies have to actually provide a opportunity for all of their investors to attend a meeting and to cast votes regarding the company's various actions and strategies. So what I do is, basically, I maintain the product portfolio. So I manage a team of IT developers that, on the one hand, tried to just make sure that the lights stay on. But then also on the other hand, we of course, build new products, and we build new features within products. And then also, as a, as a product manager, you kind of keep track of all the budgets, and you formulate the strategy for the department. So it's a bit broader in that sense, as well. You basically become the sort of the spider that sits in the middle of the spiderweb, and connects together all the the different parts of the organization.	
6. Jens	Perfect sounds very interesting. I think we can continue on to the next section of the interview, which has to do with how COVID-19 has affected your company. So the first question is pretty simple. Has COVID-19 affected your company?	

7. Respondent 2	I mean, absolutely, I think it's, it's hard to hard to avoid a pandemic, right? I think some companies are maybe affected more than more than others, of course, but it's definitely a change in, in how we do our work. That's for sure.	
8. Jens	Could you extrapolate a little bit, tell us about which parts of the organization is affected? And how?	
9. Respondent 2	So are you thinking more in terms of sort of internally within the organization? Or do you think about, for example, the kind of products that we are providing? Or?	
10. Jens	You could, uh, you could do both?	
11. Respondent 2	Yeah. I guess internally speaking, it's been a lot of moving our processes from being sort of physically bound to the office to actually be able to work from home and to work more flexibly across borders. Because even though I'm based out of *, most of the day, I'm sitting in meetings with people from Norway, from France, from Italy, and Portugal. And it was very common before COVID, that we would sort of fly out quite often and meet physically. And now all these interactions, or at least most of these interactions have had to move on to a digital format. So we have sort of implemented a number of different tools that can kind of allow us to basically perform the work that we would otherwise do physically, in the virtual context. So we work for example, with teams, which is a very common one, I guess. But also, we're working with sort of project management tools such as Asana, which is something that basically allows us to kind of keep track of what what everyone's up to what are their tasks, and we have that very sort of clearly visible in a in a software. When you're there physically, you can just, you know, tap someone on the shoulder and ask them you know how a task is going. But in the virtual context, you can't really do that in an efficient manner. So by having a tool like Asana, you can actually really see, okay, these are the 10 tasks that this guy is working on this week, you can see sort of what what are the timelines related to that. And also, you can sort of add information and things, which, which would otherwise, of course, just happen naturally in the office, you would just walk by someone's desk and say, Yes, you know, say that comment that that you were thinking. But now instead, you can just log into to Asana and just add a comment on the task that that they're working on. So I think that there's there's been a lot of sort of processes that I've had to move from being physically dependent to being online, in terms of how we are working. And then when it comes on the product	COI, DT-I

	level, as I mentioned earlier, one, one of the services that my department provides is, we cater to this annual general meeting. And as you can imagine that during a pandemic, it's not very good for companies to gather up, potentially 1000s of investors physically, in the same place. Obviously, that's a huge kind of infection risk. And there's a lot of liability related to that. But at the same time, it's actually a legal obligation that the company holds this general meeting every year. So what we did was we built a new product, which we call the the virtual general meeting. And that is basically a product that allows the company to hold a annual general meeting in a completely virtual context. And I should say that, they can also do a a hybrid meeting, so that they can have a physical presence as well as a virtual presence at the same time. So there are a few different models there. But that's basically a product that we created, because the pandemic created a demand for that, for that service.	
12. Jens	Yeah, that's great. We'll get back to that in a second. Because we have some questions that will probably probably get deeper into that. But as we take it from the interview guide, we have a question here about how you view COVID-19 as a threat, or as an opportunity? Or rather, do you view it more as a threat or as an opportunity from a business perspective?	
13. Respondent 2	Well, I think I think in many ways, it's it's both right, because there are parts of the business which are affected adversely due to the pandemic. It's it's much harder to do certain things. And it means that it's, it's harder to do business in some ways. So in that way, it's a threat. Because yeah, of course, we might lose some market share to a competitor, or we might lose some clients, because we kind of meet them physically, or whatever it may be. So in that sense, you have to sort of look at it as a threat, and try to figure out, what are the mitigating steps and what's sort of the plan that we can put together to try to avoid as many of those risks as possible. So that's kind of a kind of trying to get one step ahead of the pandemic, if you like. But, on the other hand, it also creates the opportunity to build new products, such as this virtual general meeting that I just mentioned, because we took the market by storm with this product. And because we were the first in Europe that had a product of that nature, it actually allowed us to expand into, I think four or five countries extremely quickly, just because there was no other products in the market that could do that same thing. And there was a massive demand, not just in *, but in countries	COI

	all over the world for this type of product. So in that sense, we really kind of created a strong foundation for ourselves in that market.	
14. Jens	Yeah, that is definitely something we're gonna ask you some more questions about coming up. And then the final question for this section is, have you or your company categorized the effects of COVID-19 on the business in any way? Or is it? Do you just view it as a holistic external force?	
15. Respondent 2	What do you mean by categorized?	
16. Jens	Like, do you see it as? Do you view the effects of it on your company as the social distancing and supply chain effects? Or is that not something? Any categorization happens, you just view it as a major holistic external force?	
17. Respondent 2	Well, I think at least within, within my organization, sort of different departments have different let's say objectives when it comes to the pandemic. So the legal department, they have to, of course, ensure that we are operating within the law. So all of the changes that we are having to make due to the pandemic, legal need to make sure that, that we're allowed to do these changes and that we're not breaking any laws. So they're sort of covering that part of the pandemic, that just just making sure that even though we're having to do this sort of digital transformation, that we're doing that within the bounds of what we're allowed to do. And then if you look at another department, it might be operations. Well, operations need to make sure that they are keeping their operational employees safe in the pandemic. So their focus might be a bit more on looking at sort of working processes and adapting those processes in a way to keep the operators safe. And when you look at, for example, be the IT department, they would have their own sets of concerns, whether it's sort of maybe new information security threats that can arise as a result of the pandemic. So I wouldn't say that there's sort of one overarching plan or category. I think it's when you have an organization that is this large, it sort of gets broken down and filtered into the different departments, and then the departments sort of cover, um cover their objectives.	DSE
18. Jens	Yeah, that was a great answer to a pretty tricky question. Alexander, do you have anything to add here in this section? Or should we move on to digital transformation?	
19. Alexander	No, I think it was a great answer. I think we can move on to digital transformation.	

20. Jens	All right. Okay. Well, so for starters, I'd like to share with your definition of digital transformation. So you know, how we define it. And we put it into words as a change in how a firm employs digital technologies to develop a new digital business model that helps to create an appropriate more value for the firm. Is this a definition that you think is good? Or would you define it otherwise?	
21. Respondent 2	Would you mind reading it? One more time?	
22. Jens	Of course. So we define it as a change in how a firm employs digital technologies to develop a new digital business model that helps to create an appropriate more value for the firm.	
23. Respondent 2	No, I think, I think it's quite a good summary. I mean, I would say that a digital transformation can, can be big, or it can be small, right? So in that definition, it talks about sort of creating a digital business model. And that's something that I would consider quite a large digitization project, because you could have just a working process that goes from being physical to being virtual. And that might just be a very small process. So I wouldn't necessarily say that that changes the entire business model of the organization. So I think that you can maybe talk a bit about what is the level of impact of this digitization as well, because sometimes it can be quite small. And sometimes it is a complete change to the way that a company does, does its business.	DT-DEF
24. Jens	Yeah, that is something we reflect over as well, in our report. So it's very insightful, that you have the same line of thought on that matter, as well. So yeah, earlier you mentioned the, the system for what would you say was connecting companies for yearly revisions or something of that nature meet a meeting software? Right. That was one of the digital transformation efforts that you had going on in your company? Would you care to maybe cover that a little bit more? If you could go into details?	
25. Respondent 2	Yeah, sure. So, basically, the way you can think about it is that every, every listed company, and also a lot of different types of organizations, it could even be a housing association, it can be a pension fund, it can be an investment fund. By law, they have to at least one time a year, hold a meeting for all of the representatives of that organization. So for a stock, a company, a normal company, it would be the investors, but for a trade union, it could be the members of the trade union. But basically, by law, each of these organizations have to meet and they have to discuss a number of	COI, DSE, UOT, DZ, DBMC-CVC, DT-I

	points on their agenda. I'll stick to describing companies just to keep it a bit simple, but if you want to go into the other structures, we can we can do that as well. But a normal shareholding company, they will need to discuss things like the renumeration policy. So basically how much the board of directors are getting paid. They have to to approve the yearly financial reports. And then they can have different things like they might have a new representative that's going to be elected to the, to the board, for example. And all of these different items, they get put on a agenda. And then the investors, they have the right then to to actually vote on these different items. And that's kind of how the company gets governed in many ways. I mean, that's how how the investors can, can hold the the board and management sort of responsible for for running the company. And so traditionally, this meeting will take place in a physical location. And if you have a very small company, you might have very few shareholders, and you might even have a meeting where you don't have any any votes whatsoever. But then you have larger companies, I mean, some of the bigger companies in *, they can have meetings with 1500 or 2000 investors that show up. So it's, it's quite a large operation, basically to coordinate all of those different investors being able to access their their rights at a general meeting. And that's in the physical context. So what what we did then with this new product is that we basically, we saw that there was a need during the pandemic, to, to move this physical format into the virtual format, because there are safety concerns related to gathering so many people in a closed space. And in *, this was actually illegal as well. So it wasn't even so much that how much risk are we willing to tolerate here? It was literally, you're not legally allowed to hold the meeting. So then these companies were in an awkward spot, right? Because legally speaking, they had to hold the meeting. But legally speaking, they weren't allowed to hold the meeting. So what do you do in that context? Right? Well, that's where we tried to sort of move it into a virtual format. So we created a a piece of software, basically, where we try to emulate each of the different activities that can occur during a general meeting. So you've got to think about that, both in terms of the perspective of the company that's running the meeting, they have to be able to, you know, create their agenda points, they have to be able to switch the agenda points, they have to be able to, you know, talk during the meeting, maybe show slides, you know,	

	whatever it may be. But then you also have the other side that you have the the investor, and they have to be able to, well, firstly access the meeting, they have to be able to interact during the meeting. And they have to be able to, of course, cast their votes on the different agenda points. So, these kind of became the base requirements, if you like, of, of designing this new piece of software, we have to try to emulate each of these different functionalities in the virtual context. Because not only are these sort of functionality as part of a product, but rather these are legal rights that the the shareholders have.If you are a shareholder inside a company, then legally speaking, you have to be allowed to access the meeting, you legally have to be able to interact during the meeting, which basically means to sort of make your voice heard. And lastly, you you have, you have the legal rights to cast your your votes. So we had to ensure that they could do these three things in the virtual context. And also to make it a bit more spicy, if you like. Because we offer this hybrid solution where you can have physical attendance as well as virtual attendance, then the law says that this is allowed, but then we have to make sure that that the participants that are joining virtually, they have access to the same level of rights as the one participating physically. So we cannot create a software that does seem to give an advantage either to the physical attendee or the virtual attendee. So the software really has to try to mimic the physical attendance as close as possible. So it was a question of trying to digitize this end to end process basically inside a software and ensure that that it allows the same functionality that you would have as a physical participant	
26. Jens	Yeah, wow, that was a very insightful and I think we were gonna have some follow up questions on that as well. But first off, well, Alexander, if you have anything to add?	
27. Alexander	No like on this a little bit of a follow up question on this one, I can imagine that a lot of companies had this demand of making virtual annual meetings that you were talking about. Why do you think that you succeeded in creating such like business around it? Or what were the key factors of your implementation that, like made you better than the competitors? Or in the same industry?	
28. Respondent 2	Do you mean, sort of pre COVID? Or do you mean with this new product?	
29. Alexander	No, but with this new product, because I can imagine that a lot of companies have this demand of okay, we	

	can't hold a meeting that is that we are legally obliged to do. What what can we do we can have online meetings or something like that. Why did you think that you were so successful in this? Like, in comparison with competitors, or was it because you were quicker than everyone to see this demand? Or was it because you had some key systems or something like that?	
30. Respondent 2	Yeah. Yeah. So it's a very good question. I think I think there's a few different factors at play there. But I think one part of it was actually that, that this product was something that we had started building before the pandemic happened, we basically saw this virtual format as something that that would be the new market standard, maybe not in, you know, two or three years, maybe not in 10 years, but in 20 - 30 years, that is going to be how the shareholder meetings take place. I think that as a, as a company, we sort of made that strategic vision at least. So we had started building this product before the pandemic even hit. And then when the pandemic hits. Okay, holy crap. Now, we're actually a few steps ahead of everyone else, because we already had started working on this. So I think on one hand, we were extremely quick to market. I mean, I remember that, that first year, when COVID-19 came, I think, in *, it started heating up quite a lot in something like January, or something like that, January, February, I think. And most general meetings in *, they take place in March, April, May. And we were already for that season able to provide this service. And any other company, I mean, they would have to first build this thing from from the ground up, which would take you know, minimum a year probably more like, two years, to be perfectly honest. So I think that first year, we actually did not have as many virtual meetings, as we expected, because a lot of companies they, I mean, they basically just panicked, you know, they didn't have time to sort of switch to this new format. They were sort of everyone's trying to figure out, you know, what's, what the hell do we do? So I think that that first year, we had something like, maybe 10 meetings in the virtual format. But then the year after, it jumped from 10 to about 100. And then in the year after that, it jumped to about 200. So the growth has been quite exponential. But I think in many ways, the fact that we were ready for that first season, even though we only had 10 meetings, it sort of cemented us as the provider of the solution. Everyone had seen that we had those 10 meetings that first year. And some of those clients were quite big clients as well. So	DSE, DZ

	I think most companies, they kind of look to those front runners in the following years. And they saw, okay, this seemed to work without any hitches. And we were the sort of provider of that solution. So we kind of established ourselves as the front runner in that in that area, if you like.	
31. Alexander	Yeah. Great, great example and great answer, like imagine, like, you can compare it a little bit maybe to zoom, being pretty quick, at least in education, maybe not as much and professional work life, but at least in education, Zoom were very, like quick to market and they worked, not very good, but sufficiently to provide those services. So yeah, that's a really good answer.	
32. Respondent 2	Yeah, exactly. And I would say that being sort of quick to market that's that's one very sort of strong position you can take but there's also of course, an advantage to being sort of a close second as well, because then you don't have to sort of trailblaze through all these issues and problems that that the first the first one has to pass to get through. But I would also say that within this area, because we've been providing these general meetings in in a physical context for 40 years, so I think that it would have been very difficult for a company that doesn't have a history of running these physical meetings to actually be able to create a software like this, they simply wouldn't have the right sort of knowledge and know how and, and also they don't have the the client base. I think a lot of our customers, they would feel very uncomfortable sort of taking on an unknown third party technology provider, that hasn't sort of got a a history of actually providing these kinds of services in the physical context. So I think on the one hand, we were quick to market but I think on the other hand, we also had the, the trust and the credibility of our customers in the marketplace, which made them sort of more comfortable taking this this digital direction, which of course, is a risk for them, even if they they do have to do that.	DT-I
33. Jens	Yeah, that's, that's actually pretty spot on, and aligned with our next topic, which is, has to do with the dynamic capabilities. If you've heard of the theory before.	
34. Respondent 2	I gotta say it like it vaguely rings a bell back from from my times at university, but I don't remember the specifics. No.	
35. Jens	I'll give you a definition. So we're using it to as a lens to look at companies and how they're digitally transformed. And you can define the theory as the firm's ability to integrate, build and reconfigure internal and	

	external competencies to address rapidly changing environments. And as you've explained with the example, this is obviously something you do maybe not explicitly that you work with this theory, but it seems that you follow those tendencies, at least it would that be right? correct in assuming?	
36. Respondent 2	Yeah, absolutely. I mean, it's, it's definitely been a question of looking at our internal resources and processes and organizational structures and trying to, as quickly as possible adapt that to the new normal within within the pandemic. So I think that any company that would have had a very sort of rigid structure on any of those points would have had a very hard time adapting to the pandemic. So it's definitely a question I'm having quite sort of flexible resources, flexible setups, flexible processes, that that can sort of cater to that change. I'm not gonna say that it's all been sort of sunshine and rainbows either there, there have been a lot of struggles as part of that process. So definitely, some parts of the organization have been more flexible than, than others. And you can definitely see where you have more flexibility, typically, the transformation process has gotten a lot better than when, in the parts which are more rigid.	DBMC-SC
37. Jens	Yeah, that's actually pretty interesting. Because did you use any sense of or any sort of technologies, such as artificial intelligence, or advanced predictive analytics, or anything to sense the opportunities that you had with this software that you developed? As a response to COVID? I mean, you had it going before COVID, as well. COVID, obviously, sped it up, did you use any sort of technologies or maybe external competencies from other firms such as, I don't know, PWC or the likes?	
38. Respondent 2	I mean, I think that in my company, they really want all of our decisions to be data driven. So it's not so much a question of me having a great idea to create this virtual product, I have to actually be able to show using market data, using maybe customer analyses that there is demand for this, and that there is a trend in this in this direction. So in terms of technology, we work a lot with data and definitely big data, we combine a lot of different data sets from various sources across different markets. And we have quite advanced sort of BI systems that that can help us work with this data and, and graphically represent this data. Because what I do as a product owner or product manager is that I basically need to pitch my, my ideas to the board. And then the board approves them. And I get a budget to go	DSE, UOT

	and build some some fun things. And to get those approvals from the board, you really need to be able to substantiate your your ideas using data. And the more sort of visual and better you can communicate that data to the board, the higher the likelihood that you're going to get approved. So I would say that big data is definitely the technology that we're using a lot to sort of come up with new ideas, or at least to back the ideas that we might have from from intuition.	
39. Jens	So you can say that you're using those technologies not only to spot opportunities and threats, but also to capitalize on them as a way to Yeah. All right, great. Alexander, do you have any questions on that? Or should we move on to the final section?	
40. Alexander	We can move on.	
41. Jens	Yeah. All right. Okay. So I'm upon, let me see where we're at in the interview guide, one second. Sorry, I kind of got lost here. We were talking a long while about that system. We're on this one right now. Because I think we covered these two questions. Yeah.Yeah. So let's see, how should we phrase this question to better serve? Alright, well, our question is like this, and it might be a bit repetitive now and go into things that we've already been into. But it's it's posed like this, which technologies do you use to reconfigure your internal and external resources in response to opportunities that were presented by dynamic environments? Has COVID-19 transformed the way that you work with these technologies that we mentioned beforehand? Or are things more or less the same workflow wise? Before and after?	
42. Respondent 2	No, I mean, I think there's, there's very big changes, both in terms of how we work internally, and also sort of the products that that we provide, and the services that that we provide. I mean, internally, it's been a lot of just looking at these processes and trying to put them into a virtual context. And when it comes to our products, it's on the one hand about finding these these new opportunities for for new products that can sort of better cater to this new environment. But then also looking at our sorts of our service offering and ensuring that we have a process that is safe and legal during this pandemic period, as well. So there's, there's been a lot of changes, and both in terms of sort of practical ways of working, but also in terms of the sort of technologies we use and and the products and services that we provide.	DBMC-CVC
43 Jens	And also to piggyback off this a little bit earlier, you mentioned that flexibility was a key, or I guess you	

	could say was very important to the way that your business functions, and in such by using agile, agile methods, do you think that structurally, you are better off? Or that your company is better off and can handle dynamic environments such as pandemics and such?	
44. Respondent 2	Yeah, that's a good question. I mean, I think the whole sort of Agile methodology is, it's a little bit tricky, I think, because my company says it's agile. And I think that we work in an agile manner. I mean, we are working with Scrum, and we're doing the sprints and everything. But I wouldn't necessarily say that our entire organization is fully agile at this point, I think management would want that to be the case. But I don't think that we're sort of there yet. So I think there are parts of the organization that are a lot more agile than than others, let's say. And I would even say that from one sort of development team to another development team, there's also different levels of agile within those teams. But in terms of sort of adapting to the pandemic, I definitely think that the parts of the organization that were more agile performed better. Because instead of having sort of a rigid plan, and then having to create a sort of a new rigid plan, if you like, which is, of course, a lot of work. And also, it's just very difficult to sort of predict how things are going to play out. I mean, maybe the pandemic would have been over by summer, or maybe it will take another 5-10 years, you know, no one really knows or knew at least that at that point. So I think that the parts of the organization that could sort of keep moving forward and not focus too much on what's coming in the next month, or six months or one year, but rather just be sort of flexible to be able to cater to those potential changes. They performed a lot better than than the ones that had these three year projections and plans and things.	DBMC-CVC
45. Jens	Yeah. All right. So that's pretty interesting. You said that there were discrepancies between how different parts of the organization would be more or less agile in the way that they work. Would you say that it has, what would you say that is due to is it an organizational culture or is it just something else?	
46. Respondent 2	Yeah, that's that's a good question. I think that there are sort of elements of any business, which are sort of this is the way we've always done things. And there are parts of the organization will, you've had people, I mean, I'm really impressed by this. But there are people in my organization that have won this 40 year medal. In *, you get a medal from the Queen, if you work for the same organization for 40 years. And that	COI

	has happened, I think, two or three times, as long as I've been working at this company. And I think when you've been somewhere for 40 years, and you do things, the way that you do them, and it has worked for 40 years, then you're not so interested in trying new things, you're not so open minded to the idea that it can be done better, or that it can be done differently. And I'm not saying that, okay, the longer you've worked at a company, the more rigid that that you are. But I've noticed that the departments which have a lot of people that have been there for a very long time, or maybe even, it might not necessarily even be that the people have been there for a long time, but the processes have been the same for a long time. And that's where you start getting this rigidity. They just have a much harder time adapting to a new way of working to a new type of process and sort of they want, there's, there's a lot of people in legal, for example, that I mean, they go through hundreds of sheets of paper a day, because they print everything else. There's a lawyer that has, she prints out every email that she gets sent. And I mean to you and I, that's absolutely ridiculous. But that's the way that she's been doing it for 40 years, and she's not interested in doing it any differently. So you can imagine when you want to do a sort of a workshop together with her using, you know, Trello, or using some software, I mean, she has no fucking clue what's what's going on. And those are the parts of the business which have a much harder time adapting to this pandemic change and to sort of catering to new processes and, and ways of working.	
47. Jens	Yeah, would you say that those aspects of the business or the organization have seen any shifts in their mentality as, as a direct result of the pandemic? Or are things more or less the same?	
48. Respondent 2	Well, I mean, when this lawyer has to work from home, I don't think she wants to spend that much money on printing. So I don't think she's printing out her emails anymore. That would be my guess, I haven't asked her, but I think, I think there are a lot of people that have been forced to change whether they like to or not. I mean, working from home was sort of just a reality, there wasn't a possibility to come into the office. So, you know, having to learn to use, you know, teams, and work with other types of software. It wasn't optional. I mean, it was sort of get on the boat or, or get off at the next, the next harbor, you know. But I think that, in many ways, I think that COVID-19 has been sort of an accelerator for these trends that maybe	COI

	existed beforehand. I think even the lady who was printing out her emails realized that it probably wasn't that effective. But no one had forced her to do things differently. So I think that when you have a shock that comes along like this, and people are really sort of it becomes an opportunity for them to improve, basically. So it sort of speeds up, I think, a lot of trends that are already sort of working under the surface, if you like.	
49. Alexander	Just to elaborate a little bit more on this question. How do you think now that given this pandemic, and as you said, it has speeded up some processes and maybe increased digital maturity? If you may? How do you think this has maybe contributed to your coming work? Or like the work over the next few years? Do you think that you will, for example, keep working or continue working in a hybrid environment? Like some people from home and some people from in the office, or how do you think this has impacted the way you work, since obviously, you have, in some ways capitalized from these events?	
50. Respondent 2	Well, I think I mean, like, a very sort of practical part of that is just working from home versus going to the office. And for us, we have a policy that we can work from home two days a week, and then we should go into the office three days a week, you can still go into the office five days a week if you want to. And if you want to work more from home, then you can sort of negotiate with your with your boss and you can work more days from from home, but two days is sort of the official policy. So that's that's a very practical thing that I think is is here to stay. I think that if the company had sort of told everyone to come back to the office full time, every day, there will be a lot of people jumping ship. So I think there are, there are a few things like that which are just going to be around. But what I've noticed a lot in my work is that because meetings have become much more digital in nature, now, I've started working a lot more cross border. So before, it would be a lot of having sort of physical meetings with people in *, discussing * matters, or it could be that I fly to Norway, and then for two days, we do some workshops, and we come to some conclusions. And then we go back and you know, continue our work in sort of, more or less isolation or silos. But nowadays, I mean, all of my meetings are with international people sitting in different locations around the world, and we are designing products together and, and not just sort of meeting up every once in a while,	DBMC-SC

	and then going back to our silo, but rather, all of the work that we're doing now on a daily basis is happening internationally. So we have a lot of projects now which which are cross border. And we even have our chairman of the board, he says that we shouldn't design local products anymore, that he wants any product or system or service that we build, to basically be able to scale up to different markets. So instead of just having a virtual general meeting that we can only use in *, we've actually been asked to, you know, build the system as flexible as we possibly can, so that we can also provide these meetings in Norway, in Italy, in Portugal. So, it's it sort of erased, I think, a lot of these geographical boundaries and constraints that that we've had.	
51. Jens	Yeah. So in a sense, the digital push that your company or the business model that you operate under now, after COVID has more shifted towards a focus of international trade and international collaboration, rather than just being localized to *.	
52. Respondent 2	Yeah, absolutely. And I think that's on the one hand on the product level, that we're designing international products. But I've also noticed that it's starting to shift a bit the the organizational structure as well, that we might have, you know, one legal department now that has lawyers sitting in six different countries. And these guys, they answer to one international boss now, and that boss is probably not even sitting in the same country as them. Also for, not for myself, but for some of the colleagues in my department, that we share the same boss, but then they also have another boss inside another country, that I sort of more has a more sort of specific departmental function. So even the resources and the reporting structures have started to melt together a bit more across the different bases of operations that that we have.	DBMC-SC
53. Jens	Okay, so even like, you're starting to build international collaborations within, like cross functional teams within the organization, almost as a result of COVID is, if I'm understanding you correctly.	
54. Respondent 2	Yeah, I mean, I think it's a combination of COVID. And then also that the the company that, that owns us, *, they are buying a lot of different companies, and they want to sort of try to take advantage of economies of scale by converging as much as possible. So instead of having, you know, one finance department in, in France, in Denmark, and Italy, in Portugal, in Norway, why not just have one centralized finance department that is maybe based out of Paris, let's say, but then has,	

	you know, someone working from Norway, someone working from Denmark, you know, whatever it may be. But I think that COVID definitely has enabled that to work much more effectively and smoothly because of the digitization that has, has happened.	
55. Jens	Yeah, no that's a solid response. I think we've pretty much filled the quota for what we needed to get out of this interview. Unless, Alexander, do you have any, any questions or any kind of things add?	
56. Alexander	No, I like, I think you have shown great examples of both threats that COVID brought to you. And first and foremost, the opportunities and how you could capitalize from those events that happened. I think it's been very interesting talking with you, and you have provided us with very good insights.	
57. Respondent 2	Oh, great. So I'm really glad to hear that and, of course, just feel free to reach out, if you want to any if you have any follow up questions or you're more than welcome to just shoot an email or we can even schedule a follow up call down the line, if that would be interesting.	
58. Jens	All right. That is, that is a great to know. And I just have one or two finishing follow up questions here at the end. So for the first one, have we missed anything? Or can you think of anything that so far has not been said that you think might contribute to our study? You could also put that in email, if you think of anything further down the line. It's not something where we're requiring an answer for right now.	
59. Respondent 2	No, no, I was I was more just trying to think of it. Because I think I think that when you're talking about dynamic capabilities, and you're talking about sort of digitization, I think there are so many different perspectives and angles to this. I mean, I'm talking from a sort of a product perspective, because that's what I do, right. But it could be interesting for you guys to maybe talk from talk to people that have different sort of functions within the organization, because I think that someone from the operational departments would probably look at things a bit differently to how I look at things. And the same thing goes for someone from from another department. So I think that getting some different perspectives could be quite valuable for you guys. And then also just to maybe pinpoint a bit the sort of the level of the digitization that you you're talking about, as well, because it's a very different conversation talking about building a product, like, like I described, compared to just taking a very, very small process, like not printing your email anymore. Both of	DT-DEF

	those are examples of digitization, but it's a very different conversation. So I think it's, it can be valuable to sort of frame a little bit what, what the level of the discussion should be?	
60. Jens	Yeah, that's also one of the things we, we kind of haven't frame because it's interesting to hear what kind of perspective the people that we interview take on from the start without us pushing our perspective onto them straightaway. Yeah, so. Yeah. But other than that, do you have any questions for us that popped up during the interview or?	
61. Respondent 2	No, I mean, I think it's a it's a really interesting topic. And of course, I'd be curious to kind of see, see the results. So definitely, I'd be keen to see the the finished paper if if you're allowed to disclose that.	
62. Jens	Yes, of course. We will send that to you at the end. Alright. Okay. Thank you so much for participating and have a nice Easter break.	
63. Respondent 2	Yeah, no, thank you guys, take care, bye.	
64. Alexander	Bye bye.	

Appendix 3: Respondent 3

Speaker	Transcription Text	Code
1. Alexander	Do you wish to be anonymous for this study?	
2. Respondent 3	So how will it be published in the end? So…	
3. Alexander	We're going to publish it to our own, like, internal library, or how you say it. And it's going to be public. So I think everyone can access it. Do you know more? Jens?	
4. Jens	Yeah, it's, you can find the the articles that are published in the Lund University's archive. So the master thesis is, are findable online, in that sense.	
5. Respondent 3	Okay, so in the end, in the end, would be great if you, not sure on which level you aggregate the information in the end. But if it's would, would be great if it's kind of anonymous toward, with regards to FMCG company or if you abstracted on this kind of layer.	
6. Alexander	Yep definitely!	
7. Respondent 3	That then I can speak freely and don't have to reveal any competitors. Your master's thesis and we'll know what Org3 did. I mean, it's also in the past, but yeah, no, anonymous in this case would be great. Yeah.	
8. Alexander	Great. Thanks. But to start off, could you please tell us a bit about yourself and your professional career?	
9. Respondent 3	Definitely. I'm Respondent 3. I'm part of the international digital transformation team within Org3. It's about, what is our revenue, [Redacted], revenue per year. Factory footprint is about more than * factories globally. And my role is basically driving digital initiatives globally. I'm responsible for our Smart Manufacturing, smart factory area, smart factory initiatives, everything related to advanced automation, IoT, 3d printing, augmented reality. So quite, quite a bit in the in this digital or smart manufacturing area. I'm in this role since one and a half year previously, I've worked in * industry, several * suppliers. But yeah, that's, that's a bit about me.	
10. Alexander	Great, really interesting. It's a wide range of technologies you've been working with. That's great. But diving right into the first concept in our study, COVID-19 just like an introductory question, Has COVID-19 affected your company?	
11. Respondent 3	Yeah, definitely. Yeah, it affected us significantly. And, I mean, first of all, what were the effects of, of, of COVID? First of all, the supply disruptions. So we didn't know where do we get our materials from? I mean, supply disruption is ongoing. Second part that	COI

	was majorly affected was production. Because production, we need to produce we need people in our operations to, to really, to operate the machines. If the country's government's put legal restrictions that people can't move out, you need special, special permissions. You also need PPE, you need masks, you need health protection measures, to enable people to still go to work and operate the machines. And then thirdly, also on our sales side, sales and logistics completely changed because we, we didn't know it wasn't foreseeable anymore. All our previous forecasting methods did not work anymore. So how did it affect those parts of our organization? Not sure. Do you want me to elaborate more on any aspects or is it enough? These are the three parts, purchasing the production operations and in our sales logistics, so it's really end to end affect. Overall, maybe one point, Org3 was not, or Org3 was not affected in a negative way, more in a positive way, because of the virus, people spend more on cleaning products. So actually, people were at home, they had much more time to wash the clothes, they were at home so they started cooking at home, they operated the dishwashers. That's why we actually profited. But we didn't know how it affects. And if in a country, the restaurants open, then suddenly the automatic dishwashing products declined. So it was very unforeseeable on the sales side.	
12. Alexander	Right, really interesting. So kind of a, maybe a follow up question on that one, to the best of your knowledge, do you view COVID-19 as a threat, or as an opportunity from a business perspective?	
13. Respondent 3	It was both. Because on the one hand, it was an opportunity because the demand was, was increasing, and obviously was good for business. On the other hand, we needed to be very dynamic or much more dynamic than before. Because we if you don't satisfy the demand, we will not profit from it. Or even if we're not able to produce we, we will not fulfill any demand. So we will run out of stock on a very early or very often. So our service level goes down. So our customers so the supermarket's will, will complain they will fill their products with with competitors so can also really harm the business. So well, the threat definitely for existing business, but it also was a great opportunity if your supply chain works in an agile manner	COI
14. Alexander	Yeah, great, great insights. And how would you sort of categorize those effects COVID-19 had on your business like, like you mentioned, the supply chain management and the sales team? How would you	

	categorize? Which, which part? Did it affect the most? And what did it change within the organization?	
15. Respondent 3	What did it change? So there were a lot of changes. For example, in our supply operations, our supply planning, for example, became much more agile, instead of it, maybe I can even share a because I had a different presentation last fall. And with Org3 about a similar topic. Maybe you can enable sharing?	DBMC-SC
16. Alexander	Yep, I'm just trying to... now I think you should be able to share.	
17. Respondent 3	Okay, let me briefly right, I need to swap this. Now, great. So basically, first of all, we were already well prepared kind of do you see the screen?	
18. Jens	Yeah, loud and clear!	
19. Respondent 3	Alright, perfect. Because I cannot see videos anymore. But that's probably because of the sharing. We already we're kind of digital, we have digital initiatives since 2014. So we had a lot of dashboards already digital, which allowed us to be transparent to have transparent overview of all the stocks the forecast. So other companies from my sector they started developing, try to get transparency. But what we did, we started looking at the, we increased our SNOE or SNOP, supply and operations planning from a, from a monthly basis now to a weekly basis. So every week, the logistics came together, operations came together and analyzed. Where are we running out of stock? How can we manage our inventories? What is the forecast? How do we need to plan our production? So that's basically what we managed to do in a very agile manner because it was already digital. But we, this digital tools enabled us to be even more agile because we could just refresh the dashboard more often and we and we could make decisions on a more frequent, more frequent basis. High frequency. Yeah.	UOT, DSE, DBMC-SC
20. Alexander	And would you say, you sort of implied it already. But would you say that that was one of the key aspects to why you were able to make changes so quickly and adapt to the COVID-19 crisis.	
21. Respondent 3	That's a key, was a key digitalization of our we call it well spring. So from the well, from really our supply goods to the to two ends really end to end connection. Yeah, achieving end to end connection, that's, that's what we, what we're what's kind of our vision, and we start implementing this earlier. Now, it was really a tool, a key aspect, why we were successful. Maybe another aspect and why we why we were successful. Now you see a factory of ours. I, you see, it's basically filled with a holo lens and so directly at the beginning	COI, DZ, DT-I, UOT

	of our, in the beginning of our, of the crisis, we purchased holo lenses and for every factory. So now, it gave us completely different options to really connect people from different sides of the shop floor. So as a consequence, we had country visits by our top management on virtual country visits, so everybody was at home and they could dive into the factory, we had our continuous improvement team from a factory perspective who, who attended and looked at the the line boards, the Kanban boards, the Lean management boards to to all of their their tools, they looked at this from their from home, because we had the holo lenses so that was definitely a major digital enabler. Even when we bought new, new machines, we did FAT, so factory acceptance tests, which usually take place at the supplier, we couldn't travel to suppliers. So we asked the supplier to connect with HoloLens and stream the test to via, via, via holo lenses. That's basically on the on the manufacturing side.	
22. Alexander	Really, really interesting and a really good example	
23. Respondent 3	Yeah, should I give more examples on Digital Transformation	
24. Alexander	Yeah, sure!	
25. Respondent 3	So, as I said, I held a presentation on this earlier, so the wrong slide. Yeah, so basically, another thing we did was shipment monitoring. So, we wanted to tell our customers, when will they read when, when will they receive their products for, for us for their planning. So we implemented a solution which enables Org3 but also the, the customer so supermarkets, wholesalers to see when will their product arrive, when will the truckload arrive also for them to organize the traffic or their logistics accordingly, there was also something that was really a benefit and we got feedback from our customers that this was a very helpful solution. Another thing we also had from before but it was also super helpful during COVID times because now I considered COVID, COVID and has ended today even in * where I'm located the mask dropped so you don't have to wear masks nowhere anymore. Here in this screen you see our digital twin. We have in our factories now kind of Google Streetview where you have a lot of production info in place, for example, online monitors or the the HMI of the machines. So in the end the production manager that is not required for really operations for operating the machines could stay at home but could still control the the operations because of this digital twin. Obviously large automatic warehouses were nobody works, also helped us. We're really looking	DT-I, COI, DZ, UOT, DBMC-CVC, DSE

	towards a seamless, touchless integration of our supply chain. Automatic warehouses play, play a very, very important role in that. Also, again, seamless touch less, are AGVs AGVs, automated guided vehicles, just reduce the number of people in the factories. So we also had them before we also started a new project. One aspect is definitely having, having less people inside the factories who can transfer the virus in the end. During I think Delta Variant, but also during Omicron, were really had production outages in the US in, in Eastern Europe, in North Africa, because people were sick, and we didn't have enough people to operate the machines. So the factories who were with a higher degree of automation were much more robust, because they didn't need need that many people and the tasks usually are less so that you or less complicated. So that, that you you're much more flexible. You can assign jobs to your people in a much more flexible manner. Also, yeah, predictive maintenance is something that helps us planning our spare part supply in a better in a better way. So not directly beginning of COVID, but throughout COVID, supply disruptions also transferred to our spare parts. So with predicting failures, we wanted to have more time to actually respond to, to our failures. Also, to improve spare parts supplied to shorten lead times, we introduced 3d printing in our factories. Just some form of parts you see on this slide, that's another consequence or really accelerated digitization in this field. And final slide I've presented on last time, is still operator upskilling really see that due to COVID tasks, were, it was much more difficult for operators to manage the operations to retrain to, we had to change procedures, change over procedures or centerline procedures, to more dynamic approach maybe that before two people were doing it together, for working together in machine for half an hour. To minimize risk, we try to reorganize these changeover tasks so that people can work on, on their own without, with reducing time to collaborate. So that's maybe a great, first, first overview of the impact of digital transformation on. Yeah on our, our operations. Now, you probably have a lot of deep dive questions,	
26. Alexander	No. Like really great examples. Those were really spot on. I just have one follow up question. And that is, given all these digital transformation efforts, of course, some may have been affected more than others. But how do you view like in general? How did COVID affect these digital transformation efforts? Did it affect you to maybe adapt technologies quick, more quicker	

	than before? Or did it enable you to for example, the automated factory tours and everything? How do you view that?	
27. Respondent 3	Yeah, so in this regards. Yeah, it definitely accelerated it accelerated the adoption of new technologies. We had a lot of technologies already before. But it really helped us or there was a need to focus on a couple of technologies and really drive these projects in these technologies. So, but I would, because we already had a lot of tools before, for example, our dashboarding ecosystem and the infrastructure, the data analytics infrastructure, we already had this in place. That's why we could easily build up, build up on these foundations to further and build new use cases, use cases that we were not aware of. Because of COVID. We were not aware of but because of COVID, we were aware of, and we had to work on it and quickly implement solutions. That's maybe, not sure, if that's interesting for you, but	UOT
28. Alexander	No, no, it is definitely.	
29. Respondent 3	In some some countries, we consider COVID as gone, or, like here in *, no restrictions anymore. Sweden, I think also has very little restrictions only left. So it's kind of gone. But of course, supply disruptions, inflation. There are a lot of new challenges of war in Ukraine, Russia, and there are many, many more events, and definitely COVID. And these new digital transformation or this digital technology we introduced or accelerated. It focus us, it forced us to be to be faster to be more dynamically, it's now very much of use when, when it comes to the new challenges arise, and then the past months.	COI
30. Alexander	Great, I think we've pretty much covered digital transformation. Jens. Do you have anything else to add there?	
31. Jens	Not really, I think we can probably move on towards next sections. We got a lot of great examples that we that we're going to ask you some more questions about in a minute, I think. But yeah, we can move on, in my opinion.	
32. Respondent 3	Great, maybe one thing to add, because I see you you define digital transformation maybe a bit different to, to what, how we define it. Because we're not really developing new business models. With digital tools. We're supporting our current business with digitalization and making it more dynamically and more agile through digitalization, so in the end, it has an impact on business, definitely. Otherwise, we wouldn't do it. But it's not disrupting the business model. It's more	DT-DEF

	improving the service for our customers and reducing costs for our business. So that's...	
33. Alexander	Yeah, yeah, really interesting take on it. And of course, the next question, you covered pretty good, the current digital transformation efforts and your former digital transformation efforts. So I think we can move on actually, to dynamic capabilities, which is our third theory or concept in this research. And we define dynamic capabilities as the firm's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments. And I think you already talked a little bit about this. But is it something that you worked actively with within your company?	
34. Respondent 3	Yeah, exactly. It's all about, especially in the FMCG business, it's all about being dynamic. And having, having dynamic capabilities. Highest priority being dynamic. I mean, in FMCG, we, so that's why I left the * industry because it was too static. In FMCG, we're also from, from by definition, FMCG is fast moving consumer goods. So it's more dynamic. We have many more product in introduction. So I think, every three months, we get a new product on, on every line. So it's really a different innovation cycle. Even though an innovation can be little or very small, but just changing the form of a bottle may have a huge impact on operations or on other machines that can really work with it. So definitely dynamic capabilities is what we need what we promote. In our company.	
35. Alexander	Yeah, great. And we we look at Dynamic Capabilities from, we're divided into three main perspectives of sensing, seizing and transforming. If we looking at the first one sensing, the question, which technologies do you use to spot opportunities and threats to help you manage these dynamic environments? It can be technologies such as AI Big Data, IoT.	
36. Respondent 3	Yeah of course, I could now could now say yes AI, Big Data, IoT, it all helps us, but this is just infrastructure. So in the end, to really spot opportunities, I think you don't need technologies, you need current processes. And that is something that is highly, highly related to cultures. For me, it's actually a cultural, cultural aspect. For example, if now we have a problem a supply problem in, in I don't know, in in the US for example, the factory there can hide this for a long time, if they want, if they really want, they can hide it, then then at some point it will be visible and transparent because the customer complains because it didn't get the order. So in the end, it's a cultural thing that things are	DSE, DBMC-SC

	communicated, problems, challenges are communicated and that you as a team develop solutions together. Um, that's for me the sensing opportunity then obviously, we have transparent we have we have data collection, we have our digital backbone, we call it where we collect data from from our machines data from upstream, downstream the supply chain, this is definitely a tool if you want you can, you can, you can describe with descriptive analytics just visualization of data and putting alarms whenever a threshold is exceeded. Yeah, but other than that, not really.	
37. Alexander	Okay, and we may have talked a bit about this as well. But moving on to seizing, like, what technologies or could did you use to capitalize on these aforementioned opportunity and deflect potential threats? So you talked about for example, automating the, the...	
38. Respondent 3	I think there are three main three main aspects again, first of all our supply material management, so being very dynamic, with our formulation, or formulations, for example, that we can rapidly if one one product one raw materials out of stock, we can change to another one without any any major disruptions. And that's on the supply side. On the production side. It's definitely the remote connection, remote cooperation, but also automation to reduce people inside the factories. And thirdly, in the in the supply chain, sales area, it's really about it was really about introducing transparency, on stocks, and on logistics, on logistics tracking to have transparency for customer and for for us, Org3 as a supplier.	DZ, UOT
39. Alexander	Jens, do you have anything to add there?	
40. Jens	Um, not really but I was, uh, I guess you just answered everything, I was thinking about how, with the transparency, that you were talking about how that would facilitate with the tracking solution, but you just said that yourself, so I don't have anything to add.	
41. Alexander	And, finally, like transforming which you already talked a bit about, which technologies did you then use to reconfigure your internal and external resources in response to, for example, COVID-19. Threats or opportunities such a structural financial changes.	
42. Respondent 3	So probably, I've already mentioned some of these. So which technologies did you capitalize was the previous question now it's a reconfigured internal external resources. Um, do you have an example? What do you imagine?	
43. Alexander	So for... Jens I think you have a good example for structural and financial.	

44. Jens	Well, I mean, you've already mentioned quite a few to be honest with, such as how you introduce the digital twin. That is quite the change in from how things work before COVID. So that's the way they something like that would be more along the terms of what we're looking for when it comes to technologies that reconfigure the way that you've worked beforehand, or that you in this sense with the digital twin managed facilities. That could be an example.	
45. Respondent 3	Yeah, probably now, with digital twin, probably the most important technology was teams, Microsoft Teams, or because people were at home, and that's what's really the major reconfiguration of our staff majority went home, worked from home, was connected. So that's probably not not a technology, we're not not an answer you wanted to hear. But definitely, it was very much about the people and keeping the people motivated people keeping the people connected. And what else, a digital twin wasn't a consequence of people could stay at home, but also be in the factory. Another transformation now was the augmented reality that before the country visits of our top men, and it wasn't possible, they went together because of some appointments they had. And now with COVID, they really could plan or could together could go on virtual country visits, with the augmented reality, remote collaboration devices, so that was really transforming the way how we work together. Yeah, probably in this way.	UOT, DBMC-CVC, DZ
46. Jens	Yeah. I was thinking a little bit about that, actually. And I was, what I want to ask you is seeing as you introduce teams, and these intracompany or intra country, rather, technologies to do virtual visits, were there any other types of technologies that you use to, I guess, assimilate or help different parts of your organization, communicate during COVID or function, as well for that matter.	
47. Respondent 3	What was also very important, were new new dashboards for descriptive analytics, just to be transparent. And you could really reduce the communication through that, because you have transparency. And you could just shorten meetings with everybody looking the same data. I think that was really something that, I think we became more data driven throughout COVID, as we were looking at much more dashboards, having our gut feeling had less less of control or impact on decisions, I think. But, yeah	DBMC-SC, COI
48. Jens	Yeah, no, great, great insight. On top of that, I was I was thinking a little bit earlier, when you mentioned	

	about sensing opportunities and how that's more of a cultural thing than it is something you use technology for. Could you find any example that you could share to explain how, how maybe your company does that as opposed to other companies?	
49. Respondent 3	I mean, what would we do with this? For sensing, I mean, we invest a lot in our operators, we really invest in upskilling. That they, for example, predictive maintenance, that's something that is yes, you can introduce new technology. But if people are only firefighting, to keep machines running up and running, that is not what, this won't work, you won't get any benefit from it. So you need to train your people so that they solve problems in advance before problems occur instead of rushing firefighting problems. So I think that that can be a good, good example. So when you sense opportunities for dynamic environment, that's really, that's really one, one part upskilling. Then really, a bottom up approach is very important, clear communication to the management. If you're hiding things as I'm, I've mentioned earlier, that might be a big problem. So, but also, if, If you only start, let's say at middle management or plant manager level, and you're trying to understand the current situation without speaking to the operators to really know nothing. If you don't know nothing about the, the operators, then it's, it's challenging. That's what I what I mean. So you have to start really from the bottom to, to find opportunities, because operators, people who do it every day work with suppliers, with our, with our customers with the machines on an everyday basis, they know immediately when something is different when something is disturbing them. The other problem is they get used to things very, very quickly. So you need to be fast to sense this and to tell them you need to train them, and upskill them so that they tell you whenever something's different. Not sure if that were examples that went into a direction you wanted or you expected to get.	DBMC-SC, DSE, DBMC-CVC
50. Jens	Yeah, no. But that's actually quite interesting, because that's not something we've really thought about before, or not at least touched on in our report so far. But how, how would you say that COVID has increased the amount of upskilling that you do for your operators or for your employees in general? And is that something that you continue to do after or now that COVID is over?	
51. Respondent 3	Definitely, definitely. I mean, what I've said earlier, we had less people often in the factory, and we have, we	COI, DBMC-SC,

	have more automation. So less people because half of your staff is stuck at home with COVID. And you somehow want to keep operations going so you need very versatile maintenance people. For example, if you're, if the specialist from, from machine A is gone, you need to have redundancies, you need to have people that, or know more than two machines very well. You need operators that can set the machines even though or even if the, that the viscosity of the material is a bit different because we change the raw material. Right? So this is something what would we see that the operator tasks get more and more complex. And it's also very, very difficult to find up the highly skilled people on the market, on the labor market. So what we need to do, we need to upskill our own people also regarding digitalization. So maybe one thing to mention was we, I mean, really, really through COVID. It really started in 2020. We had a, have a connected Worker Initiative. So every operator in every line in Org3 has an iPad. And on this iPads, the operator sees information about machines operator, can report errors, the operator can do behaviour based safety walk arounds. So basically checking if something is, if there is safety hazards in his working environment, gets information about CLIT tasks or autonomous maintenance tasks meaning cleaning, lubrication, inspection, tidying, so tasks that we can do while running the machine. So we have a couple of, of these apps are deployed to the operators on the shop floor, but they also need to be, be guided upskilled to interpret the data they receive, to provide the right feedback. So no, that goes into the search.	DBMC-CVC, UOT
52. Jens	Yeah, no, that's, that's really great. That's something that we're gonna have to take a bit more of a look at I think, it's not something we've thought about so much so far. But another thing that is a little bit interesting is, you mentioned before about agility within the organization. And how has the fact that or let me rephrase that perhaps. How has COVID-19 impacted the way that you work within organizational structures? Such as with Agile methods, or has it not been impacted that much.	
53. Respondent 3	I mean, you're speaking about a * multinational company, so it's, it hasn't really like agile methods itself have, has not been been implemented in, in full context or in full range. So what we, what we see is we became much more bottom up. That's something that, I think is customer orientation is one one of the Agile aspects that we, we really focus on be it our customers	DBMC-SC, DBMC-CVC

	or end customers, so the wholesalers, or be it our the customers of our digitalization tools, technologies we introduced in the factory. So the operators or mechanics were much more neat and solution focused. What else? Agility, I mean, really, project management. If we buy new machines, it highly depends. If we buy machines that we've already bought 10 times like we buy, buy a new filling line, which we know how to how to plan a filling line. That's not that's done in waterfall, really planned from beginning to end. What is for, for pilots for digital pilots, it became much more iterative, like you start developing. So for example, I have a co-ed project. We had the first pilot in December, and only because we did the first trial with a very basic solution in December, we were able to focus on, on these issues. And we recognize the issues and challenges on a very early, very early stage, and we were able to eliminate. Now we are doing the final test and the final installation. Without these these reoccurring tests every month, it would not have been able to implement such a robust solution. So yes, in project management, for new technologies, for pilots, it has been introduced. On the other hand, be more agile, more creative. Probably in the SNOP procedures, just reviewing topic or the data every month, every week instead of every month. So doing 52 plans instead of 12 supply plans. That's a huge difference. Much more agility, much more reviews of the old one of the previous reports, previous weeks reports, so it's it's going into into the search, yes.	
54. Jens	Yeah, no, that's great. That's exactly what I was after, to be honest. But uh, yeah, Alexander. Do you have any other questions or?	
55. Alexander	Yeah. I think that the last section there sums it up pretty well. I think you have provided us with some really good examples and with some really interesting insights. Do you think that we have missed anything? So far that has not been said that might contribute to our study?	
56. Respondent 3	I don't think so actually was quite, quite holistic, like your approach. Yeah maybe focus on the people a bit more, include the people perspective into your research. People or technologies without people is nothing. You need really people to technology can only leverage or what's the right word, fulfill full potential if it's integrated into the workforce.	UOT
57. Alexander	Right. Do you have any other question for us in general?	

58. Respondent 3	I don't, I don't, I will connect you with my friend who's doing this research on COVID, I think it's repurposing of production lines. But she definitely knows more. So let me connect you with her. And let's see if that can also be helpful.	
59. Alexander	That's very nice of you. Thanks.	
60. Jens	Yeah, that's perfect.	
61. Alexander	Otherwise, I think we are pretty happy with today's interview. Thank you so much for your participation, we're really looking forward to finishing up this master thesis. Yeah, massive thank to you	
62. Respondent 3	Would be great if you could share the results with me, would be really, really interested in what what your research outcome will be.	
63. Alexander	Ofcourse, yeah.	
64. Jens	We'll get that to you. I think the process should be completely finished if we pass fingers crossed in the middle of June. So yeah, so keep a lookout in your in your inbox for for the report.	
65. Respondent 3	Definitely. All right. Thanks a lot.	
66. Alexander	Thank you.	
67. Respondent 3	Have a great evening, bye bye.	

Appendix 4: Respondent 4

Speaker	Transcribed Text	Code
1. Jens	Okay, so for an introductory question to the interview, I'd like to ask if you could please tell us a little bit about yourself and your professional career?	
2. Respondent 4	Sure. So, I have been working at Org4 for 12 years now, I did start as an application specialist for and I did work with product development, most of my time at Org4. So I guess for * years, I worked making a product for Org4 not coding anything, but you know, designing the solutions and things like that. So and my background is in in, I do know a little bit of coding, but I'm not that much of a software developer. But I've done most of my kind of work in that area throughout my life. And then I switch over to to HR, the last two years, I've been working mostly with, you know, making solutions and support our colleagues, not so much with recruitment sent to but mostly with an internal organization questions and a lot of things that is related to the subject that we are going to talk about today.	
3. Jens	Oh, that's great.	
4. Respondent 4	So I hope I will, I will be able to help you with that.	
5. Jens	Yeah, I think so you've got a pretty wide expertise, we can probably find some great insights from our time today. All right, but why don't we get started? So the first section has to do with COVID-19. And we want to know how COVID-19 has affected your company? If you would like to explain?	
6. Respondent 4	Sure, so I think there's, there's two aspects of how it has affected us because one, of course, is our employees, the people in the organization and we are spread out in the, in the world. So for instance, in India, we had people in lockdown for two years, you know, completely they had to stay at home. And in *, it's been a little bit different. But of course, working from home from for most of our colleagues. So that, of course, has an effect on people's health in general, that you had to stay, to stay home. And some people actually like it a lot and had, you know, no problem with that at all. But I think more so in India, where you know, you're not able to meet at all, you and they also live in a different way, they usually live, you know, in one two bedroom apartment with their whole family. So usually they sit, you know, sort of in a closet, and they have people around them all the time. And they tried to focus on their work. And of course, we have to hire a lot of people during this time. So all of these people have been, you know,	COI

	onboarded completely remote, that is also been a challenge for us. And, but I think from the business perspective, do you know what we are doing? I know your brother is working with us, but do you know what we are doing?	
7. Jens	Yeah, we well, we have a little bit of an understanding. But if you could explain a little bit more, that'd be great.	
8. Respondent 4	Sure, so the very short version of what we are doing is, is helping our customers to move a package from point A to point B. So it's completely the integration with the customers and the integration with carriers to make that happen. And of course, when COVID hit, there was a increase of buying things online and all of our customer have also had to find other solutions of of solving their business in different ways. So of course, for us, we actually, you know, increased in our revenue, because our customers also find other ways. Of course, there was, you know, a little bit of trouble in some areas. But in general, it has been, you know, we were in the in the right market, let's say it like that. So we were in we're lucky from that perspective.	
9. Jens	Yeah, no, that's great, because that actually leads us on to the next question, which has to do with as an organization, did you view COVID-19 more as a threat or more as an opportunity from a business perspective, or was it both perhaps?	
10. Respondent 4	I think that in that way, it's both because when it comes, when it comes to not maybe a threat, but it's a concern that we have people, you know, in, because a lot of our culture is also getting together and meeting each other. And then you can also feel that if we're not seeing each other, does that affect the culture, and also you are a little bit more siloed, you only maybe meet the persons who you work with in your team, and not so many others, and maybe you don't get an understanding of Org4 does. For solutions for all of our customers, so, so we had a concern there. And we still have, of course, because we're not, you know, completely back. And we also changed a little bit when it comes to, you know, hybrid work, and people are working more from different locations. So, so it's still, you know, well, not a threat, but a concern. And we did not really see it as a threat when it comes to business, because we knew that, of course, in the beginning, no one knew, then then we all, you know, we thought it's going to be over for a couple of months. But but then we, because we also have a solution that can, that is easy to change. So we can also follow our customers really well when they change their way of working so, so I'm not allowed to talk about a lot of our customers. But we do have one customer who does talk about this themselves. So I can talk about that one. So we have a customer called *. And, and they did you know, have a store	COI, DSE, UOT, DZ, DT-I

	where, where they also have stores in in Europe, they don't have it in *, but in Europe, they have a lot of stores. And of course, they were closed completely. So you have a lot of stores owners with a lot of clothes, they wanted to sell, but no one could come to the stores. So what they did was that they changed the way of working, that you can actually when you buy things online or at *, you can actually say I want to buy it from this store. And then that store owner can deliver it out to the customer in the near you know surroundings. So that was a really good solution for them to solve, you know, people who were sitting on a lot of stock of clothes and needed to get them. And also, you know, you can support your local store by doing that. And of course, the solution was not ours, that was * but we could, you know, change really quick or helping them finding a carrier solution that you know, can drive these clothes out to the nearby end customer. So we could you know, easily and we know that we can do that. So I think we saw it more as an opportunity really.	
11. Jens	Yeah, that's some innovative thinking. Yeah.	
12. Respondent 4	It was an end. Yeah. And it worked really good. And I think that for *, I think they will continue doing that. Because, you know, it doesn't, it has a lot of saving in other areas. Well, when it comes to sustainability. So I think they will continue having this as a solution.	
13. Alexander	Yeah. I just have a follow up question. Sorry. What do you think were the, like key aspects that you were able to make this change? So quickly? Was it because your processes were interchangeable quickly? Or that you were agile? Or what was the key factor in your success there?	
14. Respondent 4	I think that well, first of all, yes, we do have a product that we can easily change and customize. And that is our strength always. And that could be you know, not so fun for the people who are doing it always. But that is our thing. So we know we can do that. But the other part which is very important that the way we are organized so so we are organized with a team of eight people and that team is responsible for the customer. So in this case, you know, we have this eight people who work really close with * all the time, and they have a really good you know, dialog and also can make you know decisions really quickly so they can make their own decisions about the customers so if they want to build something, they do it they don't have to go through all these, you know, lines of approvals. So that's also a way of us you know, keeping up with the change because the solutions and the decision making is done within the team, I think that is key.	

15. Alexander	Yeah, and you were you were able to like uphold this close contact with the customer even through COVID through the design?	
16. Respondent 4	Yes.	
17. Alexander	Yeah.	
18. Respondent 4	Because of course we don't have the most of our customers is not in in * and not nearby so we already have this, you know, this type of communications already in this type of form. So.	
19. Alexander.	Great, thanks.	
20. Respondent 4	Yep.	
21. Jens	Yeah, perfect. So if we carry on with the final question of the covid chapter of this, um, interview guide, I'd like to ask you how you at the organization categorize the effects of COVID-19 on the business? And you already mentioned earlier a little bit that maybe India was hit the hardest. Is, were there any other aspects that were, that had more or less success during COVID? within the organization?	
22. Respondent 4	I'm not sure I understand the question really? So.	
23. Jens	Okay, how about if we rephrase it a little bit? If we say that if it, were there any, let's say sectors of the organization, different parts of the organization, that, um, perhaps had a tougher time or had an easier time?	
24. Respondent 4	Okay. Um, oh, yeah, I do, as you say, I do think, of course, that when India had it tougher than we had, just because of the restrictions in the country. And when it comes to business, so I'm not really sure if had any different areas that were would say no, really. And I think that maybe we will come to this later on. But I think we started our, you know, sort of digital journey before COVID-19. So, because we were we are located in different areas in the world. So we have to make, you know, up these solutions that will solve things completely digital anyway. So so it was not, you know, this big hit, or we didn't know how to solve things, but it was just carry on, like usual, more or less. But we could not travel. Maybe I think in the beginning, at least when it comes to sales, because our sales are usually out traveling, loved meeting a lot of customers. And I think they just have to adjust a little more to the, to the concept of not meeting face to face, because they like also meet face to face. That kind of personalities. But I think I think they also because you had no choice really, I mean, in the in the beginning, you were just you don't didn't have any choice. So So you just you know, I think this change, because there was no option, you just have to live with it. And then it worked. And yeah. And I and I think now they're not traveling as much as they used to do anyway. Because most companies are you know, can we have this	COI, DSE

	meeting online instead of you know, traveling back and forth? Everywhere? So?	
25. Jens	Yeah, I think what you said there is pretty spot on, we'll we're gonna be getting into that a little bit more.	
26. Respondent 4	Yeah, yeah.	
27. Jens	In coming questions as well.	
28. Respondent 4	Yeah.	
29. Jens	Um, so without further ado, um, we can go on to the next section, which has to do with digital transformation. And first off, I'd like to read the definition we have for digital transformation within our study. And it is as follows. Digital transformation can be defined as a change in how a firm employs digital technologies to develop a new digital business model that helps to create an appropriate more value for the firm. Is this a definition that you would agree with? Or do you have? Any, any questions?	
30. Respondent 4	No, I think that is, you know, even though we haven't phrased it exactly like that, but, but, when it comes down to is also, of course, the value part. Now, how can we create more values for our colleagues? How can we create more values for our customers? And we put the data driven mindset first, but always have the people first in mind, that is always been our, in our culture, in our whatever we are doing so. So yes, I guess I will agree with that definition.	DT-DEF
31. Jens	Yeah, yeah. Great. Well, in that case, I'd like to ask you, if there are any kind of digital transformation efforts going on, or if you've maybe just completed some or have some in mind, if you'd like to explain that would be great.	
32. Respondent 4	Um, yes. So I think that, you know, as I said, then, you know, six years ago, we started our company *. And then and at that point, we had to be more you know, making especially making our tools available, and the way we collaborate with each other, we have to make that digital. So then at that point, we did you know, a journey of you know, of creating that environment, both meetings and in how we the way of working more or less and then of course we had we also change And and let's say, I will say like this. So a couple of years ago, we had an initiative called the data driven mindset. And that was how can we use the information that we have of creating more, you know, values for our customers, so that when it comes to the business part, so that was in everyone's job, so every person in the organization, were supposed to think of something that they do every day that you know, with data can make, you know, a better value for what they are doing. So even me that works with HR has the task of, of how can I, you know, make use of the information that exists and make, you know, better decisions. So, we had a lot of training going on, it was a lot of our customers, a lot of our employees to trainings. And	DSE, UOT, DZ, DBMC-CVC

	we also at that point, hired a couple of data scientists. So we had, now we have * data scientists, and we usually have also take advantage of people like you doing the master thesis. And so we have a couple of master thesis students within AI or, or data science. So they're doing that with us. So we can also learn from from them. But of course, then there was a transformation in the, because we have loads and loads of information, what that a package takes, the journey a package takes, and we can learn from that. So we, we did start using Google Cloud to collect and draw, use that, you know, pool of data to draw new solutions that can bring value to our customers to predict, predict, you know, if there's any obstacles in, in the journey. Now, of course, we had a lot of our customers did have trouble, as you might know, with all the the problem with the traffic with boats from from China, because that stopped. And now we have, you know, this huge queue of things, there. And then we had this, you know, boat that stopped in the canal and everything you know, so that, although those kinds of things, you know, affect the whole chain of the whole supply chain. And of course, that is difficult to predict when it comes to AI, but but there was a need of from our customers, to know, these things are trying to figure out if, if our shipments were going to be late or not so, so there was a lot of work in that, and we are still doing a lot of new innovative, you know, solutions around that to give value to our customers. Now we also working with sustainability to, to you know, because that is also a requirement now these days that you should know that the footprint that you make. So we're using that information from all our customers also to trying to calculate how much you actually leave when you are taking baggage to or from A to B. So, so that was from the business point of view. And I think when it comes to, when it comes to people, we are always trying to find new new ways of of, you know, collaborate between between us and bringing people together in different ways. So we're not trying to, we're going to test something called coffee pals, that just keep putting people together, we are trying other type of things to just to make that better, since we are in different places in the world and different time zones, we are, you know, spread out around the globe, which is also difficult. And the other initiatives that I was thinking of is also the automation part, you know, what can we remove from the daily work that we can create any type of automation? So we have hackathons and the next hackathon that's coming up, I think in two weeks or so, is has the focus on automation. So what is it in your daily work that you probably can make some kind of automation what can we can what can we remove from	

	from your daily work, and there's a lot of initiatives and that is a day that we sit together and just create things. I think that is you know, one of the also a key factor that we can be an innovative, innovative and have that you know, perspective of, you know, diverse people that come with up with ideas and the same thing is for me, you know, what can I do in my job that you know, when I'm onboarding a person what what are the tasks that I'm doing that probably couldn't be automated just not sent to this system or what-ever it is, you know, updating all kinds of system. So so that is is something that we do also? Right now, I think. Did that answer your question?	
33. Alexander	Yeah.	
34. Respondent 4	There were a lot of different things.	
35. Alexander	No, that was a great a great example. I just have a follow up question. On the last thing, you talked about automation and everything. Do you think that COVID had an impact and how you viewed these digital transformation efforts? So for example, automation that, for example, okay, we can have as much people in factories or supply chains in-volved in the supply chain, so we have to automate some processes? Or what is your take on that?	
36. Respondent 4	In one way, yes. Because I think that what didn't open up a little bit is that is the working market, I think, because now we are also, before we were very focused on the *, and the * area where people work, and now we can be everywhere. And we also need to increase the pace of, you know, if I'm doing, if I'm just looking at my own example of onboard-ing a person, just making that work, really updating all kinds of systems. So we are growing really fast, they are, you know, coming on maybe 30-40 people every month, so and also in different areas in the world. So it may be that I'm not able to communicate them directly. So that needs to now happen sometimes when I'm sleeping. So I think COVID changed the way we are working. And we also see that maybe people are not staying as long at a job maybe just one or two years. So so we will have, you know, a lot of people leaving and, and joining. And that I think for us the the way, you know, looking at the automation, and also the there's more you know, technology, the people, the the solutions that we are have is also focusing on integration, which also opens up a lot of doors that you can actually in-tegrate and talk to different solutions. But I think from from the business perspective, I think also that they are, you know, developers and application specialists, they need to put their time into other things, then you know, configurating, and do that kind of, of work, because they are also, their customers are changing really fast as well. So we have to keep up with them. And then we need to be	DBMC-SC, DBMC-VC

	able to quickly change things or we need to update in several systems or that kind of thing would be because we need to keep up with with their rapid changes in the world.	
37. Jens	Yeah. Which is pretty perfect as on the topic of rapid changes in the environment. That is also one of the three main concepts that we have, or are studying with our research. And there's a theory called dynamic capabilities. If you've heard of it before.	
38. Respondent 4	I haven't heard it before. So I Google it.	
39. Jens	Yeah.	
40. Respondent 4	Yep.	
41. Jens:	Perfect. Well, either way, it's a strategic management theory. And we define it as or we found a definition that we agree on, which is the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments. Is this something that you think you work with, in your company? And you already explained a little bit, but if you could think on that, and maybe explain a bit more? That'd be great.	
42. Respondent 4	Yes, so I know, we don't actually, you know, say that we are using this, you know, management theory, but, but I think that, as a company, we've always lived in change. And since we are a technology company, we also need to keep up, we can, you know, if we are, you know, a bit lazy and think that we are good, then we will die so, so we need to keep up always and learn and and develop the capabilities that we have. So, I think that it's something that we always done, we have also always, we are always changing in our company. And I think if I can take one example that we just recently did, not sure if that will fit into the theory or not, but, we, we are, we are organized like this. So we are we are a team and the team is you know, autonomous team, but they of course have a leader because someone is responsible for you as an employee, but they're more of a coaching leader, but that person is responsible for for 30 people around 30 people and that leader also has a lot of contact with the customers within that sector. So he also have a delivery, responsibility, or she. So, so what we've done last year was that, you know, these people, usually, they've stayed with us a long time. And they are, you know, very comfortable with the customers that they have and with people that they have, and we completely now changed that. So they had to move around to different customers and different teams. So it was sort of a complete, everyone had to change seat. And we did that just because to spread the knowledge and challenge our leaders also, to learn new things, but they but they also come with knowledge of their customer that they can bring into a new area of our company. And I think that that, that is our	

	normal way of working, we always need to change and we, and we are always growing. So that is also necessary for us to be able to move around in the company in different, with different customers that have different challenges, because we are, you know, having customers in different industries. So did I answer your question or?	
43. Jens	Yeah, I think you did. And I have a bit of a follow up question, which builds on an example, you mentioned earlier, having to do with how you use predictive analytics as a technology. To sense, I guess, you could say, opportunities in dynamic environments. Yeah. And if you if you have any more examples of that nature, or if you could go into how you use that type of analytics, that would be, that would be great.	
44. Respondent 4	Um, yeah. So I think that, um, I can, I can we, this has not been implemented at our work, yet, I'm not sure that we will. But we have, when it comes, from my perspective, we have looked into people analytics, and what that can give us what kind of information that could to could bring us to make better decisions as well. And that is based on you know, the information that you can get is *inaudible* in that how much people the does a person spend? Or on in meetings on emails? How many working hours? Do they you know, they're logged in at the computer? You know, are they working 14 hours or 15 hours? And are they connecting to other teams? Or are they just having meetings with people within their team. So and I think that could be an interesting for us, you know, to get an understanding of if we have silos, then maybe we can help that group of connecting to other people. And also in a forecast, if we have a group of people that works a lot. Or maybe that person is using the computer for personal reasons and not working, then it's fine. But But, but that could be one thing, or as a leader, perhaps you can see a case I have not met my this person for a very long time, or maybe this person is working too much. The problem there is course is that we don't want to be a big brother that, you know, looking into what everyone is doing. So that's why we haven't really taking that decision of doing that kind of work. But there is also this possibility of it, especially now when we have people working from home or working at the office, or how are people moving? And that kind of information could perhaps be interesting, I'm not sure. When it comes to business, I'm not really sure that I will be able to answer that question. Maybe because I'm not I don't really have that knowledge. I cannot really say anything. But I think that of course, especially now we are using the people that that comes into the, to our organization with their master thesis, they have no you know, history with Org4 right. Oh, and	DBMC-SC, DSE, DZ

	they are really good at, you know, predicting could this be something interesting and they can look at the data and have you know, ideas that we never thought of because you know, it gets sort of blinded when you're seeing the same things all the time. So that is I guess one way, um, I was thinking if I can, um, lets see, so I can take this one perhaps. Maybe I can just ask if I can share the text or not. And I can send it to you because that is an example of what we do little bit with, with, with our machine learning and the, but I'm not sure that if I can, because we have not really no sign any NDA or anything. So I need to just say don't do anything wrong. But if that is so I can send that text to you. And you can read it.	
45. Jens	Yeah, no, but that sounds great. It sounds a little bit like you use, you almost use people and their their knowledge of technology as a mechanism to sense opportunities and threats in dynamic environments, such as the master students that you've taken.	
46. Respondent 4	Yeah.	
47. Jens	Yeah. Okay, that's interesting. That's not something we've, we've come across so far in our study. So that's, that's new. I guess that also goes into the second aspect of capabilities, which has to do with how you capitalize on opportunities as well, because you take a, you use people and their competencies, internally and externally. So, Alexander, do you have any, any question that we should bring up? Or should we carry on? With the interview guide.	
48. Alexander	No, maybe? I think you've already mentioned it. But if we looked at that second question, how you capitalize if we take COVID-19 lens again, a little bit? How do you think that you could use the pandemic, from a business perspective to actually profit or capitalize from the event, so you mentioned in the beginning, that you, you were able to make, still make profit, or still survive very good in this dynamic environment? Or due to COVID? Could you elaborate a little bit more on that on how you may be capitalized or seized the opportunities that COVID brought?	
49. Respondent 4	Yeah, um, I think that the one thing that we did see as, as a need, which is another, um, you know, another solution from our side, and we call it *, so it's actually a completely different company. But what happens will happen with COVID-19 was also as I said, you know, our customer needed to find other ways of distributing the, their, their goods, and they also needed to be closer to their customer. So I think COVID-19 and the sustainability which is on the top of of all our customers agenda, that also, you know, brought that so, so one thing that we saw, of course, was the, because we do have a lot of you know, * and all those you know, small kinds of deliveries that could be you	DSE, UOT, DZ, DBMC-CVC, DBMC-SC, DT-I

	know, bike deliveries to just one person who, you know, I can do that I can drive around and deliver packages from, from a store to people in Stockholm, with, you know, within a couple of hours, but you still need to keep track of, of the package. And so that person who just have, you know, my bike and then a small company also need to be able to communicate in some way. So it needs to know, okay, I need to pick up a package here, and I need to go and deliver it to this person at this address. And you need to say, okay, I picked up the package, and I have delivered the package. So you need to have that communication. So, so we created a solution for that. So that is, you know, an opportunity to grow a little bit from not, I wouldn't say completely from COVID-19. But that was the way of us changing of buying things also that you want to get something within hours, you know, if I live in, in Stockholm, and I can buy something from from the store, and I can get it right away, instead of going through all the hubs in Sweden, and then eventually two days later into my, my mailbox, but so that is also changing out the way we are buying things. So that is something that we saw and we saw that this is a gap in the market. So, so we are you know, this is something completely new. But I'm definitely seeing that we can you know, capitalize from that. And when it comes to, you know, since we are a tech company and resources like human beings are the only resources that we have, more or less. We have data which is also a resource. But, um, there's also opened up a little bit, you know, that we can hire from more places in the world? And I think it's, that also gives us the opportunity of having more diverse people basically, because we are not, you know, located in one place. And I guess, you know, you can look at other universities also in the in the world finding other types of, of competencies and people. So I think that is a way that is that has opened up our, you know, business a little bit more than it was before. So that was a good change for us.	
50. Jens	Yeah. So in a sense, you could say that, that COVID brought about maybe speeding up of things that were already in motion.	
51. Respondent 4	Yeah, I think so. Yes.	
52. Jens	That's very interesting. That's something that we were taking a look at, to see if it is a trend across several companies.	
53. Respondent 4	Yeah. Interesting to see. Yeah.	
54. Jens	Yeah. That's interesting that you say that, but, um, in terms of structural changes, when you made, say this, this solution that you just mentioned, with the tracking feature? Did that bring about any changes in how the organizational culture works within your company, or the organizational	

	structure or as a result of COVID? Or was that not really too affected?	
55. Respondent 4	And not, say, related to COVID. And I think that we haven't really seen it yet. But this solution will need other type of capabilities that we did not have before. So it has changed a little bit of the way we are, but we are not there yet. So because we are very much in the beginning. So I cannot really say how that will affect us. But other than that, I don't think that it's you know, any structural changes in the way we are working? Not really no.	DBMC-SC
56. Jens	Maybe, if I understood correctly earlier that an organizational cultural shift could be that you're more interested in finding competencies from abroad? If that could, it, would you say that that is? More likely nowadays because of COVID?	
57. Respondent 4	Yeah, that is more likely nowadays. And I guess it's not been so much in *, but you know, in UK and US you talk about this great resignation, and also that, you know, people are moving out from the cities to, to the countryside, because that's, they talk a lot more, you know, that you can work from home completely 100%. In *, we don't have that problem, there is a little bit of traffic problem in the bigger cities, but that's about it. So you don't have that, you know, the huge need of getting out of the cities, but but we do have an office in *, and we do have in * also, that's just * persons. So it's not really an office, and we do have people in * so we have different areas in where, you know, we do have people that want to have that lifestyle. And when we do have people who want to have that lifestyle, we also need to be able to give that, you know, to be able to attract people to the company as well. And I guess that change of the way we see ourselves working and having the balance of life and work life. Then also, you know, speeded up the, the need for us to also look at different ways of working.	DBMC-SC
58. Jens	Yeah, no, that's, that's great. Were there any financial constraints during um, during COVID, or as a result of COVID that have made things difficult when performing any of these projects that we've mentioned?	
59. Respondent 4	No. No, since we had, since we had, you know, growing a lot. So we were in a good place. So no, nothing like that.	DBMC-FA
60. Jens	Okay. Great.	
61. Respondent 4	Um, I guess the only the only restrictions that was, you know, difficult was because, oh, we usually need to travel if you need to set up a new company. So it takes a lot longer time. Everything takes a longer time, but that was in general, you know, everything. Everyone was blaming COVID for everything. So everything's has taken a little bit longer time doing things but not financial.	DBMC-FA

61. Jens	Okay, that's great. And then I'd like to ask as well, if, if you think that you've seen any more of a shift towards working with more or even less with Agile methods of any kind as a result of the work from home and the pandemic in general.	
62. Respondent 4	I think in, yes, I think that we come back to the fact that you know, our customers are changing also a lot, they do, you know, rapid changes as well. And we have um, because they need to adapt to the, to the market wherever they are um, if they are in retail or or you know, other kinds of areas. And maybe, you know, whatever your brother works with, but they also had to, without mentioning any names, they also had a lot to do with that, they had to deal with a lot of changes as well. So, so with that we also need to be more agile, but I think we always had that working method in general. In everything we do, we do it the same with in with it even within HR as well. So, I would say that we know we do smaller things, and we try it out to see if it works and you know, make it duration of things that we are doing. But also because we were, we need to be adaptable and change fast. So I guess then that COVID-19 had speeded everything up a little bit. Because we need to change and then of course, the Ukraine war came and then also things needed to change. So	DBMC-CVC, DBMC-SC
63. Jens	Yeah, no. Understandable. Then I'd like to ask you, I guess a kind of a final question. Of the the the interview, which is, which has to do with some of the technology and the projects of digital transformation they mentioned? Do you think that these will carry on and continue to flourish after COVID? Or will you try and get things back to the way they were before what is more interesting, from a company perspective.	
63. Respondent 4	Um, I don't think going back is is an option, really. So that's not, that's not going to happen, I think more that we will evolving in in the way we are working, if I just look at the way we collaborate, I think that we need to be, to learn to be able to have, to, for instance, to be able to have two people online and five people in the room and have a good collaboration in that meeting. That's something that we need to learn and be better at. So, and then we need to have other tools as well to do that. And, and there are a lot companies, of course, we do have Microsoft as one of our tools. So that platform we already have, but they also you know, working a lot with with hybrid work, and how can we be better in. So they do come up with a lot of solutions to be able to support an organization to have these kinds of, of meetings, if it is just easier to connect to when you come into the meeting room and maybe have screens that you know, not big screens, but you have a smaller screen beside you. So you actually feel like the person in there. We are	COI, DBMC-CVC, DBMC-SC

	looking into not so interested yet, but the the the avatar thing that you're supposed to, I cannot really see it yet. But who knows, in a couple of years, that could be something that that could work. So we just need to figure out a good way because we are so used to having meetings and people in a room. And that is the only way you can do you know, innovating work. But I think that is going to change. So we do we will probably keep all the tools that we have we have now, that support us.	
64. Jens	Yeah, all right. Okay. Alexander, do you have any, anything on your mind?	
65. Alexander	No. I think you provided us with some great insights. I'm happy with them, too.	
66. Jens	Yeah, I think I think we've gotten what we needed. We're, we're pretty happy with everything so far. So we want to thank you so much for the interview.	
67. Respondent 4	Will, you'll be able to share the results with me so I can read or of course, of course, when you're done.	
68. Jens	Fingers crossed, that we finish on time, we should be able to get it to you and sometime in the middle of June or early June.	
69. Respondent 4	That would be great.	
70. Jens	Yeah, so I just have two closing questions, which are, have we missed anything you think so far, which might contribute to our study? Or what do you think?	
71. Respondent 4	Um, no, I think it is. It is a very interesting subject. Of course, you have also connected to a theory, which I didn't really know. So, so that was but that is also interesting to see that, you know, connection with that. And I think that I think there are companies that has been affected more with the COVID-19 that we did, mostly because we have already done the adjustments so It didn't affect us that much. So I think that you will maybe get some more, you know, connection and see some red threads with COVID-19. But of course, we you know, get we get affected by, by our customers, because they have to do things. But no, I don't think that I have anything to add, no.	
72. Jens	All right. Great. Do you have any other questions for us?	
73. Respondent 4	Um, no. What? What kind of companies? Are you talking to you? Are you picking in an area? Or are you just you know,	
74. Jens	So we've, for sampling, we've chosen to go off of the expertise of the people that we're interviewing. And we, we prefer for them to be from larger companies. So not smaller or middle sized enterprises, but bigger companies. Those are the two criteria that we have in selecting, interview candidates.	
75. Respondent 4	Okay, yeah. Yeah, it will be interesting to see and read.	

76. Jens	Yeah. Great. Well, we will get back to you when, when we're further down the line. And other than that, thank you so much for participating and have a nice day.	
77. Respondent 4	Yeah, you too, for us three. Thank you very much.	
78. Alexander	Bye.	

Appendix 5: Respondent 5

Speaker	Transcribed Text	Code
1. Alexander	So thank you for being part of this master, master thesis research on Covid-19 driven, dynam uh, digital transformation. Our research question is, how is COVID-19 driven dynamic capabilities for companies to digitally transform? Um, and yeah, the purpose of this interview is just to get to know you a little bit, then introduce some questions of our key concepts, COVID-19 digital transformation and dynamic capabilities. And you just ask them to the best of your knowledge. But to start off, could you please tell us a bit about yourself and your professional career?	
2. Respondent 5	Absolutely. Okay. Hi, thank you for inviting me. Respondent 5 working for Org5 at the moment and started *. Computer science was the bachelor in computer science, and always I've been interested in information. So my whole life, I've been working in the way of how can you really take information and really make sure that whoever is using it is getting it in the way so that they can absolutely do the best out of it. So I've been into international companies since the starting point, always working with global teams, and understanding very much how actually, difficult it is with sharing information, which also COVID is showing us absolutely tremendously. So I've been living in four countries outside * for * years, and moved back one and a half year ago, started to work for Org5. * years ago, actually. And we have always been in the area of manufacturing and production. So whatever you think when you think about how people are producing things, factories, I've been working in so many factories all over the world, looking into how you produce cars, sausages, beer, chocolate, and it's amazing to see how much actually is going on when it comes to data, and digitalization. So now Org5 is doing the same. They are a company who is really distributing software solutions for different manufacturers. And my job is a fancy fancy title called Chief Innovation Officer. What is innovation? This is the most interesting question I get every day. So for me really fun in innovation is all about transforming, transforming people, processes, technology, it's all about making sure that you are constantly thinking of new ways to do things. So it's really not just about being Einstein innovating, something particular, it's really more about constantly looking for improvements.	

	And that's what every customer is doing that Org5 is really touching. So that's where I am, and we are in * countries. And we are really then I can say not * people, but pretty much more on the technical side developers, project leaders. And of course, say sales guys and girls who wants to sell the best software for the company, the customer who we are. So that's a little bit about me.	
3. Alexander	Thanks for that great introduction. And I'm thinking we dive straight into the first concept here in our interview. So COVID-19, how has, first of all, has COVID-19 affected your company?	
4. Respondent 5	Yes, it has affected the company in many ways. First of all, the whole way of not being in an office for people working for Org5 has been, I would say a challenge. And it's a challenge because we were not used to it. I mean, yes, you can have developers and they are really kind of used to work from home doesn't matter how many of our developers are actually always in the factory working close to the customer. So you will say they don't need the office environment. On the other side, what you're missing out is really the brainstorming sessions, right? Because it's not easy to brainstorm during teams meetings, right? So even if you are a developer, even if you are a Solution Architect, it's the best time when you can sit together talking through the customer problems together with the customer on site, and then you figure out how you can do it better or quicker. So it's all about this agile project management as you know about it's really not easy to be agile, if you're not together in a room. That's one thing we noticed. Another thing that was also challenging was the way to hire new people, to hire, to onboard new people, how do you really kind of make the feeling of belonging to something, somebody, that was a little bit challenging. And the third one was the trainings, because we do a lot of trainings with our customers. So yes, everybody's used to take our training of one hour. But many times when we do trainings, we are sitting together in their production facility, three days, looking into what they are doing. And that's not easy to do remote always, because you don't really get the feeling of actually what is needed from a training purpose. So that I will say, with the challenging thing, on the other side, the positive things, we have never, ever had such a great business, because all factories suddenly realize they need to be able to watch the data from home. So the whole kind of remote connection, the remote access to the data that was really exploding. So we sold a lot of solutions, when the plant leader is sitting in other country, and the factory	COI, DBMC-CVC

	is in another country, and he still wants to monitor the data. So both good and bad.	
5. Alexander	Yeah, that was great, and basically covered both questions. Also, how does he view COVID as a threat or as an opportunity, but could you elaborate maybe a little bit more if, from a business perspective, do you now that we've gone through the pandemic and everything? Do you view COVID, in general, as a threat to your business or as a opportunity from from a business perspective.	
6. Respondent 5	So if you think about sales, for a moment, I know you're more into the technical area, but think about a salesperson who really needs to present and to explain to a factory, why they need the solution. In the past, you would always go to the factory, you will walk the floor, and you will look what they're doing in every step of the production, right. And then you have a conversation with the operators with a quality leader with the innovation leader, and you talk them through what solution is good to have there, right. And now with COVID, we were not allowed to enter factories. And even now, after COVID, a lot of customers, they don't have time anymore, they are so busy with all the backlog from the things and products that they couldn't ship and produce because of the lack of components, right and parts. So it's really now, we feel it's so hard to get a time slot when we can really go to the factory and meet face to face. So for our salespeople, and for the technical guys who needs to sit there and to specify the solution, it's really difficult if you don't get the opportunity to visit the factory. So we really have to manage it through teams, and you know yourself, how can you manage a whole factory who produce cars through teams? It's completely like, very, very difficult, right? So we need to learn how to really put together workshops, everything should be through teams, how do you make sure that all the people in the factory are actually engaging in that workshop, everybody wants to speak up, people are not used to always speak up in a room. And they're even less used to speak up in a team's environment, right. So I will say, for our salespeople, it is really getting a little bit difficult now to get through to get the time. And then if you think about marketing, that's another interesting thing. I mean, look at yourself, you have Netflix, you have Zalando, you have everything. We have that in our personal life. So we get a lot of emails, buy this buy that, oh, this is a new song on Spotify. Imagine how many times per day you get information. But then think about a person who works in a factory who really needs to produce something, to get him or her to really look into that email with some marketing to tell them	COI, DBMC-SC,

	about your solution. That's almost impossible. Because everybody is talking about digitalization and digital transformation. And all these bosses. Yeah, a lot of managers. They love to go on these conferences, right? So they go to this conference to that conference. They talk about AI, they talk about big data, they talk about digital information. And then they come home to the factory and they say to people now, hey, we need to start an AI project. And then the people working in the factory. They're like, Why? Why do we need AI because they are not connected internally, what they really need. So I think the whole way of marketing now is becoming so difficult to the business. It's easy to consumers, but it's getting more and more difficult to business world. So that's both threat and opportunity, I would say, we spend a lot of time now to really invest in our marketing people to actually make them feeling that they can know how to digital marketing towards our customers, because that's not the same as the consumer market. Absolutely not the same. So that's something that we had to do now, to learn more about how to do that.	
7. Alexander	That's a really interesting insight, that we haven't talked about a lot earlier. But really interesting. And as maybe a little bit of follow up question on on that one? How would you categorize the effects that COVID-19 had on your business? So with that question, we mean, did it affect any part of the organization more or and? Or another part less? Or?	
8. Respondent 5	No, I would say, we thought we will not do a lot of business because everything closed down pretty much. On the other side, we did a lot because as I said, people need the data more and more, since they're not in the factory, people had to go home, so they couldn't have so many people working on the same line. So they had to make sure that they actually managed the planning of the resources. When they don't get the parts into the factory. They also need to replan, right, how can you build a car if you don't get the components, so they had to put a lot of effort on planning. And because we have the solutions for planning, that was then something that we helped them with a lot. Sales and marketing we didn't think should have that big kind of threat. But as I said, it really changed the whole way of the customer's buying behavior. So that's also something that was really coming up as a big thing. But then also cybersecurity, the threat that has been causing a lot of problems for our customers, because suddenly you need to share the data outside your factory wall. And that gave so many cyber attacks, which nobody could actually forecast, right? So that's also	COI

	something that we have been helping the customers now that we didn't really think about will be a big threat, right? We kind of thought everybody has some security in place, right? But no, that was because they're not used to share data outside the factories, you know, in our marketing consumer market, I'm coming back to Netflix there used to share data with everybody Uber, they share data with everybody, right? So their security is so so good. But when you go to manufacturing and to industrial business, it's not the same thinking because they never had to share the data outside the industry. So that's a big difference. And that was something that people learned the hard way during COVID.	
9. Alexander	Yeah. Wow.	
10. Respondent 5	As a business, we had to rethink in so many steps, honestly, it was completely shocking for us how many things have to be considered, which was not really the case before COVID.	
11. Alexander	That also moves on maybe to the next concept a little bit. And we also our main concept, digital transformation, of course, we have taken a look at different definitions during this work. And we have come across a definition that is as follows. We define digital transformation as a change in how a firm employs digital technologies to develop new, a new digital business model to help, that helps to create an appropriate more value for the firm. Do you agree with this definition? Or do you have like another perspective on it?	
12. Respondent 5	So when I go out and talk to customers and to different organizations, I always start with saying digital transformation is not about the technology at all. And what do I mean by that? Because people think if we buy another software, oh my god, we will be so much going well into digital transformation. And that's completely wrong. You have heard about the word digitalization. So digitalization is about actually making sure that you transform the processes into technology so that you get the best output, right. But when you talk about digital transformation, it's absolutely more about the business models. How do you include the people? And how do you think about the whole value chain? Because it's not enough, I was meeting a customer three months ago, they were producing sausages. It was a sausage factory here in *. So you can imagine I mean, sausages. Okay, and we talk about and they said, we want to digitalize, we want to become very good in digital transformation etcetera. And they started like these big like, buzzwords, right. And then I asked the plant leader, but what do you really want? And he said, well, to be very honest, I want to make sure that my	DT-I, DT-DEF

	sausage machine is going 100% efficient. Because today, I see that my sausage machine is only producing such as 80% capacity. So for him, that was digital transformation. And I was like, well, not really, right. I mean, I understand you want to have an efficient machine, efficient production. But then I asked him, why do you want that? Because do you know when you need sausages every week? Or do you need more for midsummer? Or what is the forecast? And do you get the material from your suppliers from the farmers? Have you connected to the farmers? And then he said, No. So he has no connection to the farmers, he has no connection to the customers, but he wants to have 100% production efficiency. So then I said to him, but that's not really the case. Digital Transformation is when you have the complete connection, the business model, you talk to the farmer, so you know that he will send you the material next Monday, you talk to the customer, so you know he wants to buy so many sausages next Friday. And then you make sure that you have the technology so you can build right, you can produce sausages. That is digital transformation, when you connect the whole value chain, all the parts in the business model, right? And not just about thinking, Yeah, I have the right technology. So my machine can produce 100% sausages. It's not really what you need, right? So that's why yes, you're correct. You need to talk about the business model, the whole value chain when you talk about the transformation. Long answer, sorry,	
13. Alexander	No, no, it's great. Great is a great example. Are there any current digital transformation efforts going on at your company right now?	
14. Respondent 5	Yes, we do have internal things going on when we really want to make sure as I said, how do we go from the first interaction with a customer, til solving his problem in his factory. So that whole chain for us will be a digital transformation process, because we need to change the behavior throughout the whole thing, right. So it's not just about educating the sales guy, what he needs to do, it's about making sure that the marketing people know how to attract the customer. And then to attract, to make sure that our project leader and the engineering, the developers are actually knowing how to execute and implement the solution. So for us to connect all our roles, that's really a huge internal thing going on when we talk about the transformation, right. And then every day, our salespeople, our project people, they help our customers to do digital transformation. But that's more external, right. So we both work on internal changing behavior, but also to help the customers to change their behavior.	DT-I

15. Alexander	Yeah. Okay. Do you have any example? Maybe you're not allowed to talk about it? But do you have an example of an external digital transformation project or something?	
16. Respondent 5	Yes. So for example, you're talking to a water customer, not in * in another country. So this water company, they are really kind of, it's a water treatment plant. So they absolutely, that's what they do, they make sure that you can drink the water in your house. In that country. Every house has a meter, which is connected to the company who is delivering the water to the house to the tap, but also to the company who is invoicing them how much water they're spending. So this is something that they are now started. And it's not just about transformation, because they want to place the right solution, but it's about you and me as consumer, I can go in every day and see exactly how much water I spent for what purpose so I can make sure to plan when and why and how I want to spend money on my water supply. The same is going on with energy now, you know, the energy prices now are completely ridiculous. I mean, they are going skyrocket high, right? So think about factory who really produce whatever they produce, they need energy. So in order to make sure that the energy bill is actually not exploding, they want to produce the products the time during the day when the energy is cheapest. And that's something that they can really see because they have the connection to the company supplying the energy to the factory. And then they have the connection to the customers who needs to pay the product so they can put in the energy price in the product. So that's a typical transformation project, because then it's not enough about technology only. But you need to really make sure that all people who are actually connected, that there is a purpose for them. Why would they like to pay so much for the product? Because they see exactly this is how much money you spent for the energy who was building the product. And if we build it, during nighttime, it might take something longer, you will pay cheaper for the product, you will get it maybe two weeks later. But we built it with cheap energy. Right. So absolutely. That's something that is going on a lot now in many countries because of the energy costs and the water supply.	DT-I
17. Alexander	Right. Jens. Do you have anything to add before we move on to the next section?	
18. Jens	Uh no, I don't think so. I think, I'm gonna have some questions more towards the end when we've gotten to the latter part of the questionnaire, as I've been taking some notes. And yeah, it's interesting so far.	

19. Alexander	Moving on to dynamic capabilities. So our research is also built upon a strategic, strategic management theory initially. And it's called dynamic capabilities. And we define it as, we have adopted a definition. And we define it as the firm's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments. Is that something that you work with actively in your company?	
20. Respondent 5	So I was reading these questions and dynamic capabilities, I was really kind of thinking, what is that? What are we doing when we say dynamic capability? So for me, very simple, is really to make sure that you have the right talents, doing the right things. And if you don't have the right talents, you need to find a way to find them. And if you don't find them, because today, talents and people are really difficult to find, then you really need to make sure to upskill them, or reskill them. So internally, this is what we are actually thinking about a lot now. How do we, what kind of people do we really need? Because we see that our customers are getting new specifications and new needs. When it comes externally to the customers you have heard? I mean, you are going that education, data scientist, I mean, how many times per day do you hear that data scientist is needed everywhere. So if you think about AI, it's exploding. Everybody's talking about AI, everybody's talking about I need a data science, scientist. But then when I talk to the customers, they hire the data scientist. And guess what the data scientist is so unhappy, because he was hired for the wrong job. Because people didn't really understand what the data scientist needs to do. And if you are a data scientist, and if you really love AI, and if you really love algorithms, you put together models, you are so kind of mathematically interested, right? Then you expect if you start in the company, that they will provide you with a lot of data so you can do something with it, right? And what happens today, when they get hired into the industry world, they come to a factory, and they just don't have the data. So you're sitting there being a fantastic data scientist with so much dreams about doing your first AI project or whatever predictive maintenance or call it, whatever. And then you come there, and they say to you, but yeah, but we don't have the data you need, if we don't have the systems in place, so that you can actually get the data. So I think this is when I think about dynamic capability. I think that's the key today and for the future. Do we have the right people? Do we know what people we need? So we really need to educate ourselves, educate the HR departments, educate people in the companies, what do they really	DBMC-SC, DSE

	want with the people they hire, or the people they have, so that they make sense with getting digitally transformed, because you cannot become digitally transformed, If you don't have the skills inside. You can keep reading all the books, but you will never do anything, right. So that's pretty much how I see it. The dynamic capability if I if I say what we do internal and external, and it's equally important. Yeah.	
21. Alexander	And you talked a little bit about AI and technology. There's a there's one aspect in the dynamic capabilities theory that it's, it's called sensing. So it's about which technologies do you use to spot opportunities and threats in the market to manage these dynamic environments? Do you have an example of such technology.	
22. Respondent 5	No, because we are a distributor of software which is developed by other companies. So like GE is developing the software, we work with other companies as well. So Org5 as a group, we don't really use any particular technology, because we are very much driven by what our partners will give us to sell, right. And what our partners will give us to develop in formal in terms of applications. So that's why we don't really have our own technology. But I mean, if you if you work for Org5, of course, you go on all these trainings and meetings with the partners so that you know exactly what's going to happen. And then one big portion is about future trends, right. So we are educating ourselves and our people constantly about what's the next future trend. On the other side? Why I'm saying this, again, the industrial world is very, very slow. So you will see if you if you start to work for a company, which is an industrial company, it's a completely strange world, when it comes to how old fashioned they are. I mean, you if you not go to kind of cool environment or a startup, you end up in a big like Atlas Copco, or Volvo, or whatever you will find so, so many people in the r&d department, which are so embedded in doing the things the same way they did. So it's really, really a big disconnect today. They talk about future cool AI, but they really, really are behind. So that's why I think it's also been a little bit about technology is good to spot these opportunities. But you will realize that sometimes it's just about being very simple in explaining things for them. And they will understand it, and they will do it. But if you throw a lot of buzzwords and technology, they will just kind of, oh no, it's nothing for us, they will get even more scared. Because they see it will take a lot of time and resource from them. So it depends on what market you are in. And in our market. Unfortunately, they are quite old fashioned still the industrial complex.	DSE

23. Jens	Yeah, that's actually a trend. We've, we've heard from a few of the respondents that we've been speaking to Yeah. And I guess one of the questions I have for you regarding this is, have you seen any kind of switch in mentality, or I guess you could say, more of a will to change from these old process oriented or more waterfall model type developments that industries, factories usually employ to more agile methods as a result of COVID? Has that been a trend that you've seen?	
24. Respondent 5	Yes, yeah, absolutely. And even, we Org5 started up an agile course now, for all our people, because we see it more and more, that the customers are starting to be like that. And I would say, again, it depends on what market you are in. And it's really a little bit about, I really would love to see that we start to hire more young people into the industrial world. Because you know, having you on board in all these industrial companies will make a difference. If we keep having our old people like me 50 Plus, sitting there in r&d and thinking, Oh, we are so good. It's not going to fly, right. So, so that's absolutely to your point. That's why I think it's important for everybody to start to understand that we need to get young generation inside the industrial world. But back to you, the young generation is not so interested always to go into the industrial world. Because it seems to be a boring world. You know, everybody's kind of more thinking maybe it's more cool to go to the consumer, to the gaming, to everything like that, right. And then you talk about industry like, Oh, what are you doing? Oh, some steel. Wow, producing steel. Oh, my God. Is that cool? No. So that's why I think we are really facing the challenges because industrial world is not perceived to be a cool place to be.	DBMC-SC, DBMC-CVC
25. Alexander	Yeah, that's, that's really interesting. Back to one of the things you said in the beginning of the interview, you said that even though COVID brought threats and challenges, you also said that your business went pretty well. You could run like through with your business. So how would you say or which technologies would you say that you use or methods to capitalize on, or, yeah, create opportunities for yourself in the business, due to COVID.	
26. Respondent 5	So we did a lot of webinars, a lot of webinars, we were very quick in offering our customers free of charge training. And that was really good, because usually we are absolutely taking a lot of money for training. But now we were very quick in understanding that, hey, everybody's at home, or in the factory, not meeting people. And they just don't know maybe what to do with some time so that they don't go on trainings to a place, right. So then we started to offer like, short 30 minutes, tips and tricks how	DZ, DBMC-SC, DBMC-CVC

	you can use our software better, easier, or 30 minute digital advisor free of charge talking to you about your data. So we offer a lot of these kinds of tips and tricks, a lot of webinars, trainings, I've been doing a lot of webinars through some organizations, like talking not about products and solutions, but more about why is it important to plan? Why is it really important to make sure that you have have good talents in place? So I have been talking more about topics like that. And then of course, our project people, were very quick in adapting to try to do some workshops, to try out, because some of our customers were afraid, they didn't even know teams was something they've never ever used. So I mean, just to offer them some kind of training. This is teams, this is how we can have a meeting, nothing to be embarrassed about, you know, people didn't know how to play with the camera. People have no clue. I mean, we're talking about some of the factory workers are maybe 55 - 60 years old 65 have never been in front of a application like that, right? So it was a challenge. But honestly, it went very well. Because as I said, we make it simple, right? We kind of put away the whole scary thing about this new technology. It's more about, oh, we can let's have a virtual coffee. I scheduled so many virtual coffee. I was like, I was just reaching out to a lot of my customers. And I said, hey, let's have a virtual coffee, 15 minutes talking about digitalization. And you can see people really, really wanted to do that, because they felt that it was boring at all. And then it sounds like a little bit like, yeah, let's have a virtual coffee. I mean, I would never have been traveling to that factory to have a virtual coffee. 15 minutes. Right. So that was really what we did very quickly. And I think it makes it a little bit more like the relationship with the customer was still strong. So it was not like we kind of forgot about them. That was really important.	
27. Jens	Yeah, that's actually, that's actually very aligned with, with what you were talking about earlier, or rather, my question, I guess is, is that very aligned with the, with the end to end DT project that you were mentioning earlier? About how you were retransforming the way that you work with, within your company with external factors. It's quite interesting, because as, as you say, have you worked more with onboarding and upskilling, which is a trend that we've noticed with, with other companies. And we're wondering if there are any other aspects to that end to end transformation that you haven't yet covered that you could go into further detail?	
28. Respondent 5	Yeah, so, so when it comes to onboarding, I think we will kind of manage it pretty well, because as I said, we are in	DZ, DBMC-

	many countries. So every country has the local onboarding process, which they really very quickly switched over to be virtual. So that went pretty well. And then in *, it was never locked down. Right? We had it so much more difficult in the other countries when they really went into complete lockdown. So you were not allowed to go to the office for one year. And in *, we never ever actually closed the office. It was more about come if you feel kind of if you feel okay to come. So * was pretty much the easiest one, I would say. But then when it comes to upskilling, you're so right, because I think even internally, we really almost, I should not say force, but we really, really motivated our people to go and do some training that they will never, ever have done before. Because we were not used to do virtual training, right? We were paying people to go somewhere for three days. But now we figured out there are so many good trainings that they can actually do remotely. And all vendors like Microsoft, they offered a lot of good training remotely. And we are a Microsoft partner so people went there they become as your programmer they it was really a nice way to see that people spend so much time to really start to think about them their own development? And that was sponsored and supported by us, we really wanted them to spend that time. So I think that was absolutely an important thing that people felt still that it was useful and meaningful. Yeah.	CVC, DBMC-SC
29. Jens	Yeah. Great. Thanks for the insight.	
30. Alexander	So if I understand you correctly, a big a big, big thing in your company was the increase of digital maturity. Is that a right way to phrase it?	
31. Respondent 5	Yes, digital maturity. Absolutely. And also more, more time to spend, looking into what's coming next, you know, future technology, future trends, and take the time to discuss it with customers in a way that we didn't take time before. Because we lost a lot of time, when you travel to a customer, you sit in a car seat in an airplane, right? And now suddenly, we did have more time. So we could spend some virtual coffee discussions, and then discuss just future. And I can say some customers, honestly, they open up in a way that we have never felt they open up when we were there, maybe face to face. I don't know it just felt strain, maybe because it's easier if you have like 15 minutes virtual coffee, just one to one. People are more like relaxed, a little bit, they don't feel like if you're in a big group in a conference room, not everybody wants to talk, right? So maybe that was also one reason. Or maybe they felt we cared about them in a special way. So they felt oh, let's talk about what are you	

	going to invest next year when it comes to technology? What do you think is the right thing to do? etcetera? So it was a little bit interesting? Yeah. environment, I would say.	
32. Alexander	Maybe it was because of maybe more informal setting. Like if, if you come to a company, it's maybe often a bit more formal. Oh, we have our, the company here like we have to behave and everything. Maybe it's it's creating a setting where they feel more comfortable and everything.	
33. Respondent 5	Yeah. And you know how we used to say in *, when we say that, yeah, we like to talk about the weather in the elevator, because we have nothing to talk about. And here, it was more about virtual coffee, let's start to talk about COVID. How, how much happier are you now when you don't need to go to office and then you kind of you break the ice by throwing out some of these COVID stupid jokes. And in the end, people start to feel like, oh, this is relaxing, right? So maybe that was everybody was feeling the pain, right? The same pain. So that could have been as well.	
34. Alexander	So one of the last questions we have on dynamic capabilities is when reconfiguring and transforming your business, did any specific changes occurred to your business model? In a structural, uh, form?	
35. Respondent 5	I would say, if I might say, one department have to change, or no two actually change a lot with the guys and girls for delivering projects, because they had to become more agile, and more flexible. And then it also changed completely. I think the way we do marketing, because we had to go into this whole digital marketing, social media, LinkedIn, which we didn't do in the past so much. And make sure that the customers can read a lot about us on our website, download applications. All that was really a different thing, right. So these two departments I think, changed most.	UOT, DBMC-SC, DBMC-CVC
36. Alexander	Yeah. Yeah. That also covers because we, we talked about the way of creating value also, but you said that you had one of the departments had to move to more agile methodologies. Marketing, for example, sort of a last question we have here. Will you continue using the technology adopted as a result of COVID-19 after the pandemic or post pandemic?	
37. Respondent 5	Yes, yes, I think we will never, ever go back to so many face to face meetings, again. People are not really eager to travel so much if they don't need to, if you can do a team's meeting, we will do that. We will absolutely continue to use the technology in a way that we they can download software from our website. They can go and take support cases from our website, and the marketing	COI, UOT, DBMC-SC, DBMC-CVC

	have changed and will never ever go back. I mean, they will have to do more LinkedIn, more social media, more ways of doing that. So absolutely. I don't think the time is is going to change back No, no, it's more and more thinking about how to provide value without always having to go there. And, and then, of course, like next week, we have a huge workshop with a very big customer. And of course, we will go there, because they want us to see the factory, they want us to show them machines, we will go the three people from our side, we will meet all the leaders in that factory, these things you need to go live. Right, that that, that is so nice that it's back, because then you really can see what's going on, right? So so that will happen still, but I think most more things will still be kind of as it used to be during COVID. Yeah.	
38. Alexander	Yeah, that's a really interesting aspect. I am looking forward to see how now how, for example, relationships that were built during COVID, how they act out now after COVID it when you start meeting in person and everything again, how will that affect the business, will it affect it positively or negatively? Like what will be the outcomes? So that's a really interesting aspect actually.	
39. Respondent 5	On the other side, every person we hired, they are just so much looking forward to come to the office in every country. I mean, especially young people, Oh, my god, they really, really want to come back to the office, to still be flexible to work from home whenever they want. But to have the office environment, that's so much needed, we see it, honestly, they it's really...	
40. Alexander	It was the same for us here in the university. It was fun with the data for two weeks, and then it was like, oh, I want to go back to the university now.	
41. Respondent 5	Yeah. So you need to offer it both, I think. The hybrid needs to be there. It will stay forever. Yeah.	
42. Alexander	Jens, do you have any other question?	
43. Jens	Uh no not really, I think I think we got through, got the information that we were looking for from this interview, actually. So I'm pretty happy with what we've discussed so far, and, yeah.	
44. Alexander	I'm also very happy. Do you have? Have we missed anything that you can think of that might contribute to this study?	
45. Respondent 5	No, no, I think we touched everything. As I said, it's so good that you really capture that it's really not just about technology, it's really more about the business models, the business value out of it. That's really important. And as you say, also, where is the digital maturity, so different from, from market to market, from customer to customer. And I would say, I hope I didn't confuse you too much.	

	But it's the area of the industry where I am is really a little bit, maybe strange in a way, but still a very, very cool area. So my last words would be I would really like to see many of you coming and working for industrial companies. Yeah, we need young generation in there.	
46. Alexander	Do you have any other questions for us?	
47. Respondent 5	No, no, absolutely not. I think your topic and is really, really good. And it's important. And I think that's absolutely something that a lot of companies are now going back and thinking through what happened during the past few years. And what can we learn from it? So I think that's really absolutely a good study you're doing so I'm looking forward to see the results.	
48. Alexander	We will share them with you as soon as possible. I think we're going to be done. Or completely done in the middle of June somewhere. So.	
49. Respondent 5	Super, super. When are you graduating them? When are you?	
50. Alexander	The graduation ceremony is the eighth of June but we, we were not getting the grade until mid, middle or end of June? I think	
51. Respondent 5	Oh, nice. I'm so happy for you. Good luck. And yeah, hope to see you soon somewhere. Thank you very much. Thank you both. Ciao!	

Appendix 6: Respondent 6

Speaker	Transcribed Text	Code
1. Alexander	Hello and thank you for participating in research on COVID-19 driven digital transformation. And our research question for this thesis is how it COVID-19 driven dynamic capabilities for companies to digitally transform? And we're thinking first, first to get to know you a little bit and then discuss some of our key concepts which are COVID-19, digital transformation and dynamic capabilities. So before we start, we were wondering, is it okay if we record the interview?	
2. Respondent 6	Yeah, that should be fine.	
3. Jens	Jens could you please start recording?	
4. Respondent 6	Do I need to sign an NDA or anything like that?	
5. Alexander	No. No. It's to make it more easy for us to transcribe.	
6. Respondent 6	And I guess what isn't clear to me is, Am I doing this in a personal capacity or a professional capacity?	
7. Alexander	Personally, yeah, personal capacity.	
8. Respondent 6	Okay, because I actually, I actually worked on the *, hence. Sort of just trying to get clarity as to what's going on where.	
9. Jens	Yeah, yeah, no problem. We will confidentialize your answers if you so wish,	
10. Respondent 6	Cool.	
11. Jens	Yeah.	
12. Alexander	Okay, but then to start off, could you please tell us a bit about yourself and your professional career?	
13. Respondent 6	Yeah, no problem. So I'm Respondent 6. I'm a senior manager at Org6 in *. So I've previously worked with the * firm. And now the Org6 firm, I've been based in * for almost the last six years or so, primarily working in design, digital transformation strategy. From a personal perspective, I've worked primarily [Redacted], as well as through my Org6 career advising, primarily government organizations on a wide range of use centered design and digital type things.	
14. Alexander	Okay so straight through the first concept COVID-19. This is a pretty broad question, but you just answered to the best of your knowledge, has COVID-19 affected your company? And if so, which part of the organization did it affect?	
15. Respondent 6	Um, so. So I think with COVID, much with a lot of organizations, if anything, so I work in consulting, so if anything, a lot of us were busier, right? A lot of us, Yes,	COI, DBMC-CVC

	working from home was a bit of a faff, it's probably not my preferred means of working. But I think there's a range of challenges. Like if you look at work life balance, I think that was a challenge for everyone, particularly for those with young children or those without the appropriate space to work from home, all of that kind of thing. From a workload perspective. Again, I can't speak for other people. But for us, we were extremely busy. In terms of our client work, and the various goings on for everyone, I think for a number of our clients, those who weren't on digital transformation journeys, were probably, if anything forced to accelerate those given the need to keep businesses operating. The inability to do so in a face to face setting.	
16. Alexander	Right and, and do you view sort of a little bit maybe now post pandemic but still in the pandemic? Do you view COVID-19 as a, as a threat or as an opportunity from a business perspective?	
17. Respondent 6	I think it's both right. And I think for some businesses, I guess it depends on the type of business how they're able to be agile and orientate or the type of service depends if they're dependent on staff, you know, immigration. For example, if I look at someone from *, if I look at *, a number of businesses, small businesses, small and medium sized businesses, particularly in hospitality were suffering because they came to depend on staff, who are typically transitory. So on temporary visas from other countries, for example, and as a country, it's close its borders, I think the * was a bit different. For some businesses, it was much easier for them to pivot to a much more digital kind of setting. But others, I think it was a bit more challenging. I think different industries are affected differently, particularly the hospitality sector, I think, took quite a significant hit, obviously travel because you weren't allowed to go anywhere. So I think it just really depends on the industry to be quite frank and the policy settings of the government of whichever respective country it is. I think the * had a slightly different setting. So if I compare it directly to *, it's the only other country I'm particularly close to given that my family still live there. You, the * had quite you where possible, tried to keep the economy open and running. Whereas * had very different policy settings that were about saving lives, without the resources that the * had, for example, the investment in testing.	COI
18. Alexander	Great. And moving on now to Digital Transformation. In our thesis, or in our research, we define digital transformation as a change in how a firm employs digital technologies to develop a new digital business model that helps	

	to create an appropriate more value for the firm. Is this a definition that you would agree with? Or do you have another perspective?	
19. Respondent 6	I wouldn't necessarily disagree with it, it's probably not how I would define digital transformation. Yes, in some settings, it is about new business models. But in other settings, it's actually just about improving efficiencies in your business or reaching a new set of users. I think it just depends on the setting, if I think about digital, a h of it is now about orientating experiences around user.. customers. And how do we use or enable those experiences through technology to then generate efficiencies, savings, whatever it is in the overall operating model. Those savings and transformation is enabled by technology. But I think sometimes, particularly in a lot of contexts, people sort of jumped to technology before they actually think about and understand what the problem or the user need actually is.	DT-DEF
20. Alexander	And are there any current digital transformation efforts going on in your organization right now that you could tell us a bit about?	
21. Respondent 6	I think all organizations are undergoing significant amounts of digital transformation, right? If you think about the employee experience, Org6 is no different to any other organization, and that we will or might just remove Org6, if we can just redact that and say why it's no different from any other organization, in that it is competing for talent, and the overall employee experience becomes absolutely critical. So how do we make sure all the things that we need to do, for example, whether that's things like time sheets, or training or whatever is made as easy as possible?	
22. Alexander	And would you say a sort of follow up question on that one? Would you say that COVID had an impact in how you viewed this transformation within your company? That it, for example, increased the digital maturity? Did you did it force you to, as you said, train, make people do more training within the company or how did it affect?	
23. Respondent 6	So, I get Sorry, just a piece of feedback. When you ask, are asking questions, I would probably opt for more open ended questions rather than directed questions. As someone who leads teams that do user research, just a piece of feedback. So sorry, if you go back to the initial question before you started prompting me with some closed questions.	
24. Alexander	Did COVID impacted the way you view digital transformation or the way you perform transformation efforts in your company?	

25. Respondent 6	So you mean how did COVID? If anything, it probably accelerated it, right? Like I work in an organization where digital was kind of at the core of what we do. So, I think that all part of the business. It accelerated some things, particularly around remote working. But I, I think those things probably would have happened regardless. You know, the kind of push to using Zoom, Teams, I think the other thing that COVID enabled us as a business to realize as people didn't need to travel as much as they used to do. So for example, in 2019, I commuted to * every week for a year. Which now is, yeah, wouldn't be a necessary thing to do.	COI, DBMC-SC
26. Alexander	Yeah. And our research is also built upon a strategic management theory, and it's called dynamic capabilities theory. And we define it as the firm's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments. Is this something that you would say that you work actively with?	
27. Respondent 6	Could you define that in plain English.	
28. Alexander	So the firm's ability to basically transform, or make changes in the business within the organization to address rapidly changing environments due to external events, such as COVID-19.	
29. Respondent 6	I think parts of the organization are good at that other parts and not I think it sort of depends on, you know, the type of tolerance for ambiguity and change. I think, for my part of the organization, we're dealing with change all the time. So people tend to be a lot more okay with that, I suspect for other parts of the organization, it might be more difficult. But again, I can't speak for those parts of the organization.	DBMC-SC
30. Alexander	And talking a little bit about specific or technologies, do you, to your knowledge, do you use any technology to spot opportunities, opportunities and threats to help you manage dynamic environments, such as big data, IoT? AI, for example,	
31. Respondent 6	Some parts of our business do, I don't specifically, I might get inputs or outputs from some of that technology, depending on the client project I'm on. But again, it depends on project. But there are parts of our business whose role is to focus on disruptive technology.	
32. Alexander	Okay, and given once again, the pandemic and the situation? Could you give an example or not to make, to make it more open… Did you, could you in some way capitalize on some of the events that COVID brought?	
33. Respondent 6	Um I think a lot of organizations capitalized on the events that COVID bought. You know, from a personal perspective, yes, I got to work on the pandemic. But a lot of organizations I think, were in the same place, I think, where	DZ

	organizations were able to capitalize were the ones that were able to pivot their operations in response to the need.	
34. Alexander	And could you see like, was there, was, was it? Do you think, because of agility? Or what was the reasons why, why the main key success factors, obviously, why they sort of could capitalize on those events.	
35. Respondent 6	I think agility is a key point of that, right. But again, it's different for different organizations. I can't speak for other organizations, I think those who were able to pivot were the ones that were able to be agile, redeploy resources, and focus on different things.	DBMC-CVC, DBMC-SC
36. Jens	Yeah, as a quick follow up question that how would you say the matter of organizational culture impacts a firm's ability to navigate dynamic environments?	
37. Respondent 6	So I work in a part of the business, which is a very, you know, we jokingly referred to our part of the business as the rogue pirate ship versus the kind of I guess the bigger mothership. Part of the business has always welcomed change and always had to be agile to pivot. And to respond to things. I think other parts of the business probably find that challenging, but I, again, can't speak for them. I think having, being able to embrace ambiguity and actually work through that is absolutely critical because the entire pandemic was actually about ambiguity. Nobody had any certainty about what was going to happen next. And, you know, if you take sort of digital transformation, for example, taking an agile approach or not even digital transformation, transformation in general, taking the agile approach is probably more appropriate in a pandemic setting, given that there was no certainty about what was going to happen next. So you couldn't do a large scale, longer term, traditional waterfall transformation, for example, because things were changing so rapidly, that, you know, if you weren't able to pivot and learn from what's happening, I think you weren't able to deliver the things that you needed to.	DBMC-SC, DSE, DBMC-CVC
38. Jens	Yeah, no, that makes sense. And also, um, during the pandemic, in any digital transformation, projects that you lead, were a part of, did you find any new ways of creating value? Change? Did any changes in your value proposition in your company occur?.	
39. Respondent 6	Um, again, I can't speak for the wider organization, I think, I think that's quite a difficult question for me to answer, given the work that I did on the pandemic. If this, if we can take this off the record for context, [Redacted]. So it's quite hard for me to kind of provide a perspective that's not directly work related.	
40. Jens	All right, okay. Yeah, we will redact this part.	

41. Respondent 6	Yeah. But basically Org6 played a massive role. I know that the firm does talk about that quite proactively, we basically effectively design the entire service in the * and the operations that underpinned it.	
42. Jens	Yeah, no, that's, that's very interesting. The technologies that were created during, during the turbulent times, that was COVID, will these technologies continue to be adapted and used?	
43. Respondent 6	So we worked on the digital delivery of the, with [Redacted]. Yes, some of that will be reused. But some of it will also be decommissioned. Again, in an agile context, you responding to what the need is, at the time, you know we weren't delivering, say, products. As such, we were delivering a [Redacted] service in the pandemic.	UOT
44. Jens	Yeah, now that makes sense. And also, more speaking to the matter of working from home and like business meetings being taken more online? Is that something that you will continue to do after the pandemic?	
45. Respondent 6	Yeah, I think all organizations will continue to have a bit of hybrid working, I think, for some things online working, isn't that effective. So for example, things where you need teams, you know, anything to do with team building, actually getting to know people, I think, in person, trumphs online tenfold, I think there are some collaborative activities that are better done in person. So for example, we have got a session today to think about our business model. One person was dialing in, but we're not catering for it being an online meeting, we're going to have a whiteboarding session, because that's what it kind of necessitates. I think it depends on the setting. Like obviously, you can have work arounds using Miro, Mural or other online tooling. I think for some digital delivery activities, remote is fine. But again, it depends on the activity and the purpose.	DBMC-SC
46. Jens	All right	
47. Respondent 6	I think most businesses will probably opt towards a hybrid model.	DBMC
48. Jens	Yeah, that seems to be the trend among respondents we've spoken to so far. But yeah, I think we've reached the end of a questionnaire we have for you. So I'd like to end, I'd like to end with just two quick questions. The first being if we've missed anything that you think could contribute to the study that so far has not been said.	
49. Respondent 6	I'd probably think about regional contexts. So different governments had different settings, which drove different levels of transformation, and things that people needed to do. So in the *. There was quite heavy, sort of digital setting anyway, right? Like I never get cashed out. I pay for everything on my phone. I hadn't seen my wallet in about	DBMC-CVC

	three weeks. And I, well it was more about three months when I went back to * and had to find it. Whereas other countries may have been more cash heavy, so the transition might be a bit harder for others. So I think just thinking about the local context that people are operating in and the policy settings and what the impact of those were.	
50. Jens	Yeah, yeah. That's a great, great idea. And also on the topic of confidentiality, as we talked about before, how about if we send the transcript to you once we're done, and you can…	
51. Respondent 6	Yeah. Yeah, that's fine.	
52. Jens	That'd be good?	
53. Respondent 6	No problem.	
54. Jens	All right. Awesome. And the final question we have is simply if you have any questions for us that have not been answered so far.	
55. Respondent 6	No, not at all. Unfortunately, I have to drop, I've got a hard stop at 10:30 for an interview. If I do have any questions, I'll drop you guys a note.	
56. Jens	Okay, sounds good.	
57. Alexander	Thank you very much, Respondent 6.	
58. Respondent 6	Perfect. Thank you.	
59. Jens	Have a nice day.	
60. Respondent 6	You too. Bye.	

Appendix 7: Interview Guide

Hello and thank you so much for taking the time to look at our interview questions for our master thesis research on Covid-19 driven digital transformation. Our research question is *how has Covid-19 driven dynamic capabilities for companies to digitally transform?* The purpose of this interview is to first get to know you a little bit, then introduce some questions that pertain to the different categories of our research (as can be seen in the bold headers below), to get your expertise and knowledge on the topic and finally open the floor for some discussion.

Introduction Questions

1. Do you mind if we record the interview?
2. Do you wish to be anonymous?
3. Please tell us a bit about yourself and your professional career
    a. What is your current role and responsibility in the organization

Covid-19

4. Has Covid-19 affected your company?
    a. If so, which parts of the organization did it affect?
    b. How did it affect those parts of the organization?
5. Do you view Covid-19 as a threat or as an opportunity from a business perspective?
6. How would you categorize the effects of Covid-19 on your business?

Digital Transformation

7. We define Digital Transformation as a "*change in how a firm employs digital technologies, to develop a new digital business model that helps to create and appropriate more value for the firm*" (Verhoef et al. 2021, p.889).
    a. Do you agree with this definition or do you have another?
8. Are there any current Digital Transformation efforts going on at your company right now?
    a. If so, could you please give some examples?
    b. If not, have you completed any efforts recently or are you planning some in the near future?

Dynamic Capabilities

9. Our research is built upon the strategic management theory of Dynamic Capabilities, We define dynamic capabilities as: *"the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments"* (David J. Teece, Gary Pisano, & Amy Shuen, 1997). Is this something you work with actively in your company?
    a. If yes, could you please explain how?
    b. If not, do you work with any other management frameworks to be able to address rapidly changing environments?

10. Which technologies do you use to spot **(sense)** opportunities and threats to help you manage dynamic environments?
    a. Did Covid-19 impact the way you used these technologies at all?
    b. Did these technologies affect your Digital Transformation efforts?
        i. If so, in what way?

11. Which technologies do you use to capitalize **(seize)** on the aforementioned opportunities, and deflect potential threats to manage dynamic environments?
    a. Did Covid-19 impact the way you used these technologies at all?
    b. Did these technologies affect your Digital Transformation efforts?
        i. If so, in what way?

12. Which technologies do you use to reconfigure **(transform)** your internal and external resources in response to opportunities that were presented or threats that were deflected by dynamic environments?
    a. Did Covid-19 impact the way you used these technologies at all?

13. When reconfiguring (**transforming**), did any changes occur to your business model in the form of the following aspects?
    a. Structural - such as changes in organizational structure and employee competencies, even changes in organizational culture is of interest.
    b. Financial - such as the financial constraints that governed the transformation efforts.
    c. Way of creating value - such as changes in value proposition, value networks, digital channels or even the switch to more agile methodologies.

14. Will you continue using the technology adopted as a result of Covid-19 after the pandemic?

Finishing questions

15. Have we missed anything, or can you think of anything that so far has not been said that might contribute to our study?
16. Do you have any questions for us?

Thank you for participating!

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